Beyond Pre-K

Rethinking the Conventional Wisdom on Educational Intervention

by James J. Heckman
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Most parents can readily attest that earlier is better when it comes to helping children. Indeed, the oft-repeated parenting maxim "Get them while they're young" is not just homespun wisdom but a consistent finding of social scientists who study government programs for disadvantaged youths. One of the best investments government can make to raise academic achievement and reduce welfare dependency and crime is the provision of quality preschool programs. Yet popular support for early intervention has a more pessimistic if less publicized corollary among both parents and policy analysts: Namely, that not much can be done to alter the paths of children once they hit the rebellious teenage years. Then, the baleful influence of peers, the lure of street culture, and the failure to have developed skills in childhood all take their toll—or so the theory goes. In practice, remediation programs for adolescents have proved costly and often ineffective.

I, too, once subscribed to this split view of how best to aid disadvantaged youths. In fact, much of my work as an economist has been devoted to demonstrating the impressive economic and educational return to early interventions. Yet research that I recently undertook with a fellow economist at the University of Chicago, Flavio Cunha, has forced me to rethink the conventional wisdom. I now believe that early interventions with children are not so productive if they are not followed up with ongoing investments in children during their elementary and secondary school years. Instead, we need to invest early in children—and not stop. And by "invest" I do not simply mean that government should be pumping money into new social programs for disadvantaged youths.

Our research project started several years ago, when the America's Promise Alliance, founded by Gen. Colin L. Powell, approached us to do a novel assessment of five "promises" or essential building blocks that children need to flourish. These five key resources—the value of which has been demonstrated time and again—include having a caring adult in a child's life, offering an effective education, and providing access to health care and proper nutrition. We then asked what would happen if government, the private sector, and families continued to invest in children throughout their childhood, much as landmark preschool programs like the Perry Preschool initiative in Ypsilanti, Mich., had done in the past. But we did not limit our analysis of skill-building investment to government dollars spent on schools and educational initiatives.

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We examined, as well, the skill-building investments that families make in their children, such as reading to kids, providing encouragement with schoolwork, and setting good examples through community service and healthy lifestyle choices. These nongovernmental investments foster persistence, reliability, and self-discipline—all important predictors of

school performance and subsequent success on the job. Government policy does not create, but can help sustain these "noncognitive" skills—our analysis assumed, for example, that policymakers would expand effective mentoring programs, adolescent-literacy initiatives, and college-tuition programs during the teenage years.

The results of our projections were striking—and surprising. Our study looked at the impact of investing in boys, the most troubled teenage demographic, and especially at boys born to low-achieving white mothers. We found that without additional skill-building investments, most at-risk boys will falter. Only about two in five boys, we determined, would graduate from high school, fewer than 5 percent would enroll in college, and more than 40 percent would wind up convicted of crimes or on probation.

Boys who had the benefit of a comprehensive preschool program fared better. They were more likely to graduate from high school and go on to college—and considerably less likely to be convicted of crimes or go on welfare. But the unexpected finding was that at-risk boys were easily most successful when investment was sustained into the teenage years. Under that scenario, more than nine in 10 boys graduated from high school, and nearly 40 percent attended college. Only about 10 percent of the boys would be convicted of crimes—and just 2 percent would end up on welfare.

These gains in educational achievement and the corresponding declines in criminality and welfare are quite large. To put these numbers in perspective, sustained skill-building investments would go a long way toward shrinking, and in some cases eliminating, the nation's worrisome racial disparities in academic achievement, drug use, and college attendance. And while ongoing investment in children is expensive, the country would ultimately save tens of billions of dollar each year in reduced welfare payments and increased productivity. The Princeton University economist Cecilia Rouse estimates that the reduced earnings of high school dropouts alone account for $50 billion in lost income taxes each year.

Much in the way that compound interest creates exponentially larger returns on monetary investments, ongoing investments in children's skills have a multiplier effect. Traits learned young, like perseverance and self-discipline, make it easier to acquire skills during the teenage years. Skills, that is, beget skills. But the enduring value of these noncognitive abilities has politically conservative implications as well. Disadvantaged teenagers often receive poor discipline and little encouragement at home—making it incumbent upon educators to do more to enforce strict discipline within high schools and middle schools.

Too often, government officials design programs for children as if they lived their lives in silos, as if each stage of a child's life were independent of the other, unconnected to what came before or what lies ahead. It's time for policymakers now to look beyond the silos, to begin recognizing that consistent, cost-effective investment in children and youths can pay for itself. Providing young people with the resources they need to compete in today's global economy is not just a moral imperative. It is an economic necessity, too.

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Outcomes Linked to High-Quality Afterschool Programs: Longitudinal Findings from the Study of Promising Afterschool Programs

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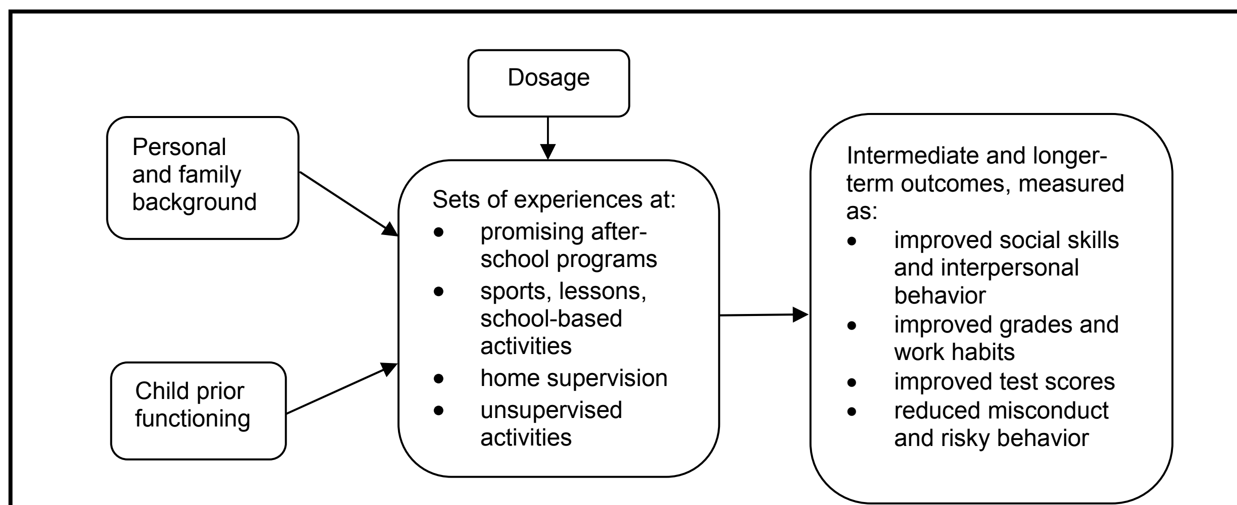
Summary

A new study by researchers at the University of California, Irvine, the University of Wisconsin-Madison and Policy Studies Associates, Inc. finds that regular participation in high-quality afterschool programs is linked to significant gains in standardized test scores and work habits as well as reductions in behavior problems among disadvantaged students. These gains help offset the negative impact of a lack of supervision after school. The two-year study followed almost 3,000 low-income, ethnically diverse elementary and middle school students from eight states in six major metropolitan centers and six smaller urban and rural locations. About half of the young people attended high-quality afterschool programs at their schools or in their communities.

Background on the Study

The Study of Promising Afterschool Programs was designed to examine relations between high-quality afterschool programs and desired academic and behavioral outcomes for low-income students. The study was grounded in an assets orientation, which understands that all young people, including those living in poverty, have capacities to make healthy, positive choices if given the opportunity. The research team reviewed previous research on child and youth development in order to depict the processes that lead to positive student outcomes, as shown in Exhibit 1.

Exhibit 1
Theoretical Linkages between Afterschool Experiences and Student Outcomes in the Elementary and Middle Grades



Program Characteristics. The study's research team identified over 200 candidate programs from a review of published materials, recommendations from afterschool experts, and evidence from evaluations. Through telephone interviews, document reviews, and site visits, team members screened the programs to narrow the list. As a final step, researchers conducted on-site interviews and quality-verification observations to confirm the quality of the 35 programs selected for the research study. Nineteen programs served elementary school students; 16 programs served middle school students. Programs were based either in schools or in community centers that coordinated with nearby schools. Study sites were geographically diverse and included: Aurora, CO; Baldwin, MI; Bridgeport, CT, Central Falls, RI; Denver, CO; Los Angeles, CA; Missoula, MT; New York, NY; Oakland, CA; Pawtucket, RI; Salem, OR; San Diego, CA; San Ysidro, CA; Seaside, CA. All programs served high concentrations of ethnically diverse, low-income youth in high-poverty communities.

The programs offered services four or five days a week and were free of charge to students. Program leaders expected students to participate regularly throughout the school year. Each of the selected programs served at least 30 students in one or both of the two age groups studied, elementary school children in third or fourth grade and middle school youth in sixth or seventh grade.

The programs had strong partnerships with neighborhoods, schools, and community organizations. These partnerships were instrumental in ensuring that the afterschool organizations were well established in their communities and were likely to continue operation over the two-year study period.

Because the study was designed to assess the effects of high-quality programs, the research team verified each program's continuing quality during annual visits to conduct interviews and observe youth activities. Using a rating system, researchers assessed programs based on evidence of supportive relationships between staff and child participants and among participants, and on evidence of rich and varied academic support, recreation, arts opportunities, and other enrichment activities. Ratings were consistently positive. Students typically were highly engaged with one another and with program activities, and group leaders structured activities to maximize learning and positive relationships. Adults facilitated activities without imposing controls that limited student learning opportunities. Disruptive or chaotic behavior was rarely observed; when behavioral disruptions occurred, leaders managed them calmly and constructively.

Through a mix of recreational, arts, and enrichment activities, programs were observed to nurture positive interpersonal relationships among students and to actively engage them. Programs offered age-appropriate learning opportunities, including tutoring and games designed to improve math and reading skills, plus recreational activities, community-based service and other experiences, and arts opportunities. Program staff was trained and, in surveys, expressed satisfaction with their working environment. Programs maintained low youth-to-staff ratios and strong connections with partner schools and with parents.

Student Characteristics. A total of 2,914 students (1,796 elementary school and 1,118 middle school) were studied. At recruitment, the elementary sample was in either third or fourth grade, and the middle school sample was in either sixth or seventh grade. The elementary sample was

47% male and 89% received free or reduced-price lunch at school; 88% were students of color (77% Hispanic, 8% Black, 3% Asian). On average, mothers' highest educational attainment was a high school diploma or GED, and annual family incomes were less than $20,000.

The middle school sample was 47% male and 63% received free or reduced price school lunch; 69% were students of color (49% Hispanic, 13% Black, 7% Asian). Mothers had about the same level of educational attainment as the elementary group, and average annual family incomes were in the $20,000 to $25,000 range. The characteristics of the study participants mirrored the characteristics of the schools they attended.

At the end of the second year, 1,434 of the elementary participants (80% of the recruited sample) and 855 of the middle school participants (76% of the recruited sample) remained at the participating schools and were available for data collection.

Participation in Afterschool Programs and Other Activities. Initially the research team sought high-quality afterschool programs that operated as stand-alone programs. They soon found, however, that many students sampled for the research were participating in multiple afterschool experiences in addition to those provided in the sampled programs. Students were also spending time supervised at home, and some spent substantial time with no adult supervision at all.

High-quality afterschool programs were a significant resource for the students, but they sometimes competed to attract students who also had access to community centers, sports teams or leagues, and churches and other faith-based organizations that hosted recreational programs, tutoring, and religious lessons. Also, through provisions of the No Child Left Behind Act, many low-performing schools extended the school day with supplementary academic support programs. Other options for students at the close of the school day were homes with no adult present in the afterschool hours as well as street corners, shopping malls, and other unsupervised settings.

Over the two-year period, 54% of the children in the elementary school sample routinely participated in one of the high-quality afterschool programs, typically attending the programs for 2-3 days a week. Most program children (about two-thirds) did not participate in other activities after school and were categorized ***Program Only***. One-third of the program children, however, attended the programs for 2-3 days a week while also participating in other activities (organized sports, church, Boys and Girls Club, etc.). This group of children was categorized ***Program Plus***. About 15% of the elementary school children spent 1-3 days a week unsupervised by adults after school, and dropped in sporadically on a mix of sports, school-based activities, and academic, arts, or religious lessons. This group was categorized as ***Low Supervision***.

Almost half (49%) of the middle school sample routinely participated in one of the high-quality afterschool programs. Similar to the elementary sample, two-thirds of the program group in middle school could be categorized as ***Program Only***. And, one-third of the program group in middle school participated in additional activities and were categorized as ***Program Plus***. Sixteen percent of the middle school youth were categorized as ***Low Supervision*** after school.

Child Outcome Measures. Classroom teachers and participating youth completed surveys to measure the social (social skills with peers, prosocial conduct with peers), academic (grades, task

persistence, work habits), and problematic (misconduct, substance use, aggression) functioning of study participants. Standardized test scores in reading and math were collected on each child through agreements with participating school systems. Data on sampled students were collected at three points over a two-year period: baseline, end of Year 1, and end of Year 2.

Analytic Strategy. Prior to conducting the primary substantive analyses, a multiple imputation procedure was used to address missing data due to attrition and failure to complete all assessments. In this procedure, missing data are replaced by a sample of observations drawn randomly from a multivariate distribution fit to the variable and covariates. The advantage of this approach is that all observations are included in the analysis, and missing observations are treated as unknown only to the degree that they cannot be reliably inferred from other variables. Consequently, the potential for bias in the estimated effects due to missing observations is minimized, and the standard errors for model parameter estimates are computed correctly. Ten imputed data sets were created in which different samples were selected for missing observations, utilizing a Markov chain Monte Carlo procedure implemented using the SAS v9.1 PROC MI.

Following imputation of missing data, two-level random-intercept HLM models were fit in which students (Level 1) were nested within schools (Level 2) for each child and youth developmental outcome. These models allowed researchers to assess change scores in child and youth performance across two years with respect to both school factors and individual factors including sets or clusters of afterschool experiences. HLM also accounts for the statistical dependence that emerges among observations collected in multilevel samples, a common source of model misspecification when applying single-level models.

In the HLM analyses, researchers contrasted changes in scores from baseline to Year 2 for the ***Program Plus*** vs. ***Low Supervision*** groups and ***Program Only*** vs. ***Low Supervision*** groups. These contrasts allowed researchers to examine whether the selected afterschool programs and enrichment activities were protective for children and youth who are at risk for social and academic problems. Researchers controlled for a number of personal and family characteristics that potentially influence participation in various afterschool settings, including child gender and ethnicity, and family background (family income, family structure, maternal education, and maternal work status). Analyses were conducted separately for the elementary and middle school samples.

In order to evaluate the meaningfulness of findings that were statistically significant, effect sizes were calculated and compared to effects from other studies. An effect size is a statistical tool that is useful in interpreting the magnitude of the difference between two measures. Unlike a test of statistical significance, the effect size is not affected by the size of the samples assembled for the study. For readers to understand the relative magnitude of the effect sizes of the findings reported below, the following benchmarks based on other recent studies may be useful:

- A study of the impact of instruction by Teach For America teachers on math achievement found an effect size of 0.15 on math scores after a year of participation in a classroom led by a Teach For America teacher (Decker, Mayer, & Glazerman, 2004).

- A study of the impact of the reduction in class size in elementary classrooms by eight students per class found an effect size of 0.23 on math scores after one year (Finn & Achilles, 1999).

- In a review of four studies of afterschool programs, Kane (2004) concluded that the expected impact of an extra hour of instruction delivered in an afterschool setting over a school year equals an effect size of 0.05 in reading and math.

- An evaluation of the 21st Century Community Learning Centers Program in Louisiana found that the impact of this afterschool program was an effect size of 0.13 on a combined measure of reading, math, and language test scores (Jenner & Jenner, 2007).

Findings

Exhibit 2 summarizes the results of the statistical analyses.

Outcomes of Elementary School Students

Academic Outcomes

- Elementary school students who regularly attended the high-quality afterschool programs (alone or in combination with other activities) across two years demonstrated significant gains in standardized math test scores, compared to their peers who were routinely unsupervised during afterschool hours. Regular participation in the programs was associated with gains of 20 percentiles in math achievement test scores over the two-year period for the Program Plus group relative to the Low Supervision group (effect size = .73) and 12 percentiles for the Program Only group relative to the Low Supervision group (effect size = .52.)

- Program Only and Program Plus students also posted gains in teacher reports of work habits (effect sizes of .31 and .35, respectively) and task persistence (.23 and .30, respectively) over the two-year period. The students also reported gains in their work habits (effect sizes = .24 to .41). These gains in work habits and task persistence may have provided important support that contributed to the gains in math achievement.

Social Outcomes

- Program Only and Program Plus students posted significant gains in teachers' reports of students' social skills with peers (effect sizes = .21 to .30) and prosocial behaviors (effect sizes = .21 to .23). Program Only and Program Plus students also posted significant reductions in aggressive behaviors with peers (effect sizes = .29 to .34).

Problematic Behaviors

- Reductions in elementary students' reports of misconduct (e.g., skipping school, getting into fights) over the two-year period were reported by the Program Only and Program Plus groups, relative to unsupervised students (effect sizes of .66 and .51, respectively).

Outcomes of Middle School Students

Academic Outcomes

- Middle school students who regularly attended the high-quality afterschool programs (alone or in combination with other activities) across two years demonstrated significant gains in standardized math test scores, compared to their peers who were routinely unsupervised during afterschool hours. Regular participation in the programs was associated with gains of 12 percentiles in math achievement test scores over the two-year period, relative to students who were routinely unsupervised after school. These gains generated effect sizes of .57 for the Program Plus group and .55 for the Program Only group, relative to the Low Supervision group.

- Middle school students who regularly participated in high-quality afterschool programs had significant gains in self-reported work habits, relative to unsupervised students (.33 for Program Plus and .20 for Program Only).

Behavioral Outcomes

- Reductions in misconduct over the two-year period were reported by Program Plus and Program Only middle school students, relative to the Low Supervision group (effect sizes of .64 and .55, respectively).

- Middle school students who regularly participated in afterschool programs also reported reduced use of drugs and alcohol, compared to those in the Low Supervision group. The effect sizes (.47 for Program Only and .67 for Program Plus) are four to six times larger than those reported in a recent meta-analysis of school-based substance-abuse prevention programs aimed at middle school students (Gottfredson & Wilson, 2003).

Conclusion

This study found positive outcomes among youth who regularly attended high-quality afterschool programs, either alone or in combination with varied sets of additional enrichment experiences available in their neighborhoods. In contrast, low supervision coupled with intermittent participation in an unstructured program of extra-curricular activities posed developmental risks to both elementary school and middle school youth.

The study focused on economically disadvantaged, minority youth, many of whose families were recent immigrants. The research team could not know for certain whether the same sets of experiences and outcomes would characterize youth in different cultural groups. The findings, however, demonstrate the benefits of continuous participation in high-quality afterschool programs, community activities, and supervised home settings for youth from economically disadvantaged families.

These findings suggest that plans for high-quality afterschool programming should span entire communities. When communities and program providers unite to recruit and engage youth in high-quality afterschool experiences, programs can provide the types of benefits described here

for the largest number of students. As found in this research, a lack of supervision after school is associated with seriously negative outcomes for disadvantaged youth. Working together, youth-service providers, schools, local governments, and civic organizations can reach out to youth who would otherwise be unsupervised after school and can match them with organized, adult-supervised activities in the afterschool hours.

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