

Exploring New Research on Pre-K Outcomes

Adrienne Fischer, Tom Keily and Matt Weyer

As pre-K programming increasingly garners more political attention and funding in the states, policymakers are seeking the most up-to-date and rigorous research to support decision-making and creation or expansion of these programs. High-quality pre-K has [bipartisan support](#) in part because of the vast amount of existing research detailing positive benefits — notably that it is of [great benefit](#) to students from low-income families and those who are dual-language learners. However, some research also demonstrates that positive growth among pre-K students isn't [consistently sustained](#) over time. This idea is known as “convergence” or “fadeout,” because the short-term gains of pre-K attendees may diminish in early elementary school.

The reasons for these mixed findings vary. Some researchers have pointed out that large-scale, public pre-K often varies in quality from program to program, making comparisons difficult. [Others have suggested](#) that the convergence effect may be a function of the instruction provided in kindergarten and early elementary grades, which often focuses heavily on improving the skills of struggling students who may lack access to pre-K rather than building on the skills of pre-K attendees.

This Policy Brief aims to capture and make sense of the most recent research studies on pre-K programs and outcomes. It does this by building upon, “[Untangling the Evidence on Preschool Effectiveness: Insights for Policymakers](#),” a pioneering study by the Learning Policy Institute, to analyze a set of research studies conducted between January 2018 and March 2020. To better understand the research findings, reference the glossary of key terms.



44 states plus D.C. offer state-funded pre-K programs, which are often seen as an important investment in early childhood development.

Research on the effectiveness of pre-K programs is generally positive, with some findings of converging effects, in part because there are a lot of variables that are hard to control for.

This new analysis of 15 research studies finds significantly more long-term positive outcomes — extending beyond kindergarten — than converging effects.

GLOSSARY OF KEY TERMS

DUAL-LANGUAGE LEARNERS: These are children up to age 8 who are in the [process of learning English](#) while still learning their home language.

EXECUTIVE FUNCTION: This group of skills helps an individual [focus on multiple streams](#) of information at the same time and revise plans as necessary.

PRE-K: This includes part- and full-day educational programming for students ages 3 to 5.

PROGRAM EFFECTIVENESS (SHORT-TERM AND LONG-TERM): *Short-term effectiveness* is generally defined as improvements in academic (generally literacy and math skills) and non-academic outcomes (e.g., social and emotional skills, self-regulation) when compared with a control group at *kindergarten entry*. *Long-term effectiveness* mirrors short-term effectiveness, but with a focus on outcomes *at the end of kindergarten and beyond*.

QUALITY: There are two main indicators of quality in pre-K settings: process and structural. *Process quality* refers to the “child’s day-to-day experiences in pre-K settings and includes the social, emotional, physical and instructional aspects of children’s activities and interactions with teachers, peers and materials that are the proximal determinants of child development.” *Structural quality* includes class-size maximums, child-to-teacher ratios and teacher qualifications, among other characteristics.

RETENTION: Grade-level retention is often a metric used in pre-K effectiveness studies as a proxy for academic and/or social and emotional readiness and/or achievement.

SPECIAL EDUCATION PLACEMENT: This is another proxy used in research studies, primarily related to placement based on behavioral and/or developmental challenges.

What the Research Says

In addition to the evidence of pre-K’s positive impacts on student achievement, pre-K enrollment has also been demonstrated to provide positive generational gains, modest-to-strong returns on investment, enhanced social and emotional learning skills, and spillover effects to students who did not participate.

For example, in [a study demonstrating generational effects](#), children of program participants were found to be more likely to:

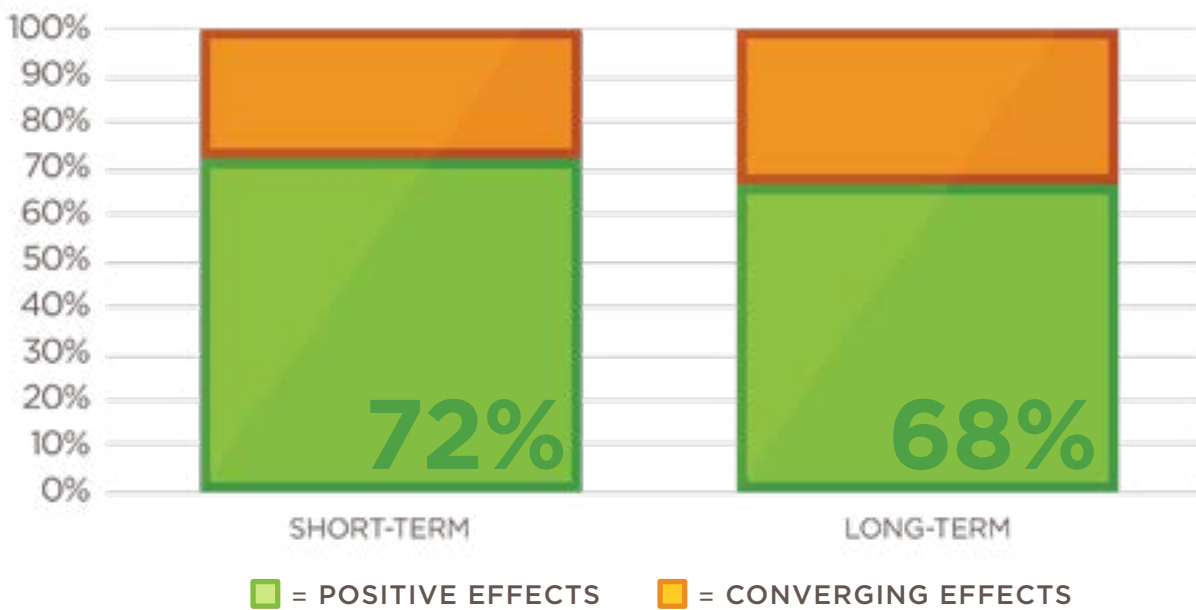
- Never be suspended from school, addicted or arrested.
- Have at least a high school diploma or some college experience.
- Be employed full-time or be self-employed.

- Estimates of the return on investment in pre-K range from \$2 to \$13 per dollar spent and strongly depend on the level of quality.

Additionally, a [recent review of 33 research articles](#) found small-to-medium effects for development of social and emotional skills and reduction in problem behaviors. [Studies have also demonstrated spillover effects](#), where students ineligible to attend pre-K demonstrated benefits from being enrolled in elementary classrooms with their pre-K attending peers.

The Education Commission of the States analysis considered a subset of 15 research studies, published between January 2018 and March 2020, demonstrating 37 outcome effects. Each study demonstrated at least one positive effect, and some studies also demonstrated converging effects. This chart provides a breakdown of the outcome effects in both the short and long term. Short-term effectiveness is generally defined as improvements in academic and non-academic outcomes at kindergarten entry. Long-term effectiveness focuses on outcomes at the end of kindergarten and beyond.

COMPARING SHORT-TERM AND LONG-TERM FINDINGS



In the analysis, the majority of research demonstrates positive effects for those who participated in pre-K: 70% demonstrated positive effects in the short term and long term, while 30% demonstrated converging effects.

The analysis also looked at the number of positive and converging effects for specific content areas:

OUTCOME MEASURE	EFFECTS
LITERACY	11 green squares, 1 orange square
MATH	7 green squares, 2 orange squares
SPECIAL-EDUCATION PLACEMENT REDUCTION	1 green square, 1 orange square
RETENTION REDUCTION	3 green squares, 1 orange square
ON-TIME HIGH SCHOOL GRADUATION	1 green square
EXECUTIVE FUNCTION	4 green squares, 6 orange squares
LANGUAGE DEVELOPMENT (FOR DUAL-LANGUAGE LEARNERS)	2 green squares, 1 orange square
SCIENCE	2 green squares, 1 orange square
SOCIAL STUDIES	1 green square
GPA	1 green square
TOTAL NUMBER OF EFFECTS	33 green squares, 11 orange squares

 = POSITIVE EFFECT  = CONVERGING EFFECT*

*INCLUDES NULL FINDINGS AND NEGATIVE EFFECTS.

The research shows positive short- and long-term effects across academic skills in reading and math for all students and language development, specifically for dual-language learners. Additionally, research found that pre-K contributed to reductions in grade-level retention, as well as increases in on-time high school graduation and executive function. Also of note are several studies that found larger short- and long-term positive effects of pre-K for low-income children and dual-language learners.

To separate positive effects from converging effects, it is important to consider questions of whether, how and for whom a pre-K program is effective. Because these are complex questions to

investigate, researchers are looking at a variety of new methods to discover what works best and in which environments. The following list highlights some critical areas of current consideration for developing pre-K systems at scale.

QUALITY OF EARLY ELEMENTARY LEARNING ENVIRONMENTS. [Recent research in Tennessee](#) showed that while pre-K students did not perform better overall than a control group in third grade, students who attended high-quality elementary schools and were taught by highly effective teachers in the years after pre-K performed significantly better than a control group without pre-K.

STRATEGIC ALIGNMENT BETWEEN PRE-K AND EARLY ELEMENTARY. [Studies have shown](#) that aligning curricula to build on the content covered in pre-K has a significant positive effect on achievement in kindergarten, whereas pre-K without the enhanced curricula showed convergence.

UNDERSTANDING THE ROLE OF PRE-K QUALITY. While elements of process quality — such as teacher-child interactions and curriculum materials — are thought to have a greater effect on student outcomes, structural quality components may [also have an influence](#).

QUANTIFYING STUDENT OUTCOMES. While social and emotional learning and behavioral development are harder to measure than academic skills, these soft skills are [frequently linked](#) to later academic and career success. Studies of curricula focused on social and emotional learning have shown [promising results](#) among low-income children, but incorporating these skills uniformly on a large scale still presents a challenge.

Final Thoughts

State policymakers continue to prioritize pre-K programming. In the 2018-19 school year, [they invested more than \\$8.75 billion in state pre-K programs](#) — a \$301 million increase from the previous year (up 3.6%). And in 2020, at least 19 governors touted early learning in their [State of the State address](#).

This new analysis shows positive effects for pre-K programs across all studies, with some instances of convergence with peers in comparison groups. [Emerging research](#) suggests that sustaining the positive effects gained by students during pre-K may be partly a function of the learning environments that follow in the early elementary grades. In order to create learning environments that sustain pre-K effects, policymakers can consider factors such as school and teacher quality, exposure to challenging content, engaging home experiences and parental involvement.

Policymakers can also enable long-term, consistent, aligned and disaggregated data collection to allow state education agencies and researchers to evaluate pre-K effects that inform future policy decisions. As of 2018, [22 states link data across all early care and education programs](#) (e.g., child care and pre-K programs).

Importantly, pre-K should not be expected to inoculate children for the rest of their educational careers. What follows the pre-K years is also critical in providing high-quality environments that sustain positive gains, especially in the K-3 grades.

Finally, while scaling high-quality pre-K environments will be a continual challenge, above all, safe environments, positive classroom climates, and consistent, caring and responsive educators are paramount to ensuring that positive effects from pre-K are developed. More comprehensive and longitudinal data collection and evaluation can go a long way in improving states' pre-K systems.



INTERESTED IN LEARNING MORE?

To explore more state policy trends and other important context for statewide pre-K programs, refer to Education Commission of the States' [Key Issue Page on Early Childhood Education](#).

Research Articles Included in this Analysis (Listed by State and/or Locality)

ALABAMA: “Achievement Gap Closure and Gains Associated with Alabama First Class Pre-K,” Alabama Department of Early Childhood Education.

CHICAGO: “The Chicago School Readiness Project: Examining the Long-Term Impacts of an Early Childhood Intervention,” PoLS One.

COLORADO: “Colorado Preschool Program Legislative Report 2020,” Colorado Department of Education.

DENVER: “The Effects of Full-Day Pre-Kindergarten: Experimental Evidence of Impacts on Children’s School Readiness,” Education Evaluation and Policy Analysis.

GEORGIA: “Children’s Outcomes through Second-Grade Findings from Year 4 of Georgia’s Pre-K Longitudinal Study,” University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute.

GEORGIA: “Participation in Georgia’s Pre-K as a Predictor of Third-Grade Standardized Test Scores,” Child Trends and Bright from the Start, Georgia Department of Early Care and Learning.

MIAMI: “New Benefits of Public School Pre-Kindergarten Programs: Early School Stability, Grade Promotion and Exit from ELL Service,” Early Childhood Research Quarterly.

NATIONAL: “Estimating the Relationship Between Preschool Attendance and Kindergarten Science Achievement: Implications for Early Science Achievement Gaps,” Education Finance and Policy.

NEW YORK CITY: “Strengthening Children’s Math Skills with Enhanced Instruction: The Impacts of Making Pre-K Count and High 5s on Kindergarten Outcomes,” MDRC.

NORTH CAROLINA: “Effects of the North Carolina Pre-Kindergarten Program Findings Through Pre-K of a Small-Scale RCT Study, 2017-2018 Statewide Evaluation,” University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute.

NORTH CAROLINA: “Long-Term Effects of Early Childhood Programs Through Eighth Grade: Do the Effects Fade Out or Grow?,” Children and Youth Service Review.

TENNESSEE: “Effects of the Tennessee Pre-Kindergarten Program on Children’s Achievement and Behavior Through Third Grade,” Vanderbilt University.

TULSA: “Tulsa Pre-K Alumni Are More Likely to Complete Algebra I Early,” Georgetown University, Center for Research on Children in the United States.

UNSPECIFIED LOCATION: “Starting Early: The Benefits of Attending Early Childhood Education Programs at Age 3,” American Educational Research Journal.

VIRGINIA: “The Effects of Public Pre-Kindergarten Attendance on First-Grade Literacy Achievement: A District Study,” International Journal of Child Care and Educational Policy.

About the Authors



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