



The Power of Preschool: What We Know from Lottery Evidence

Policy Brief | November 2023

Overview and Policy Issues

From 1970 to 2018, preschool enrollment in the United States grew from 38 percent to 64 percent of eligible students.¹ Preschool is widely believed to generate significant returns on investment. For example, as President Barack Obama said in 2017: for “every dollar we put into high-quality early childhood education, we get \$7 back in reduced teen pregnancy, improved graduation rates, improved performance in school, reduced incarceration rates.”² Today, half of 3-year-olds and a third of 4-year-olds are not enrolled in any early childhood education (ECE) program,³ and enrollment rates are lower for Black, Latino, and low-income children.⁴ Stark inequities exist in ECE access by geography, race, and family background.

Meanwhile, federal, state, and local investment in ECE programming has grown to nearly \$12 billion annually, and states and cities nationwide are expanding their ECE programs with bipartisan support.⁵ Fourteen states are currently discussing preschool expansion, with seven likely to pass some form of universal eligibility within the next calendar year.⁶ Amid this growth, parents and policymakers alike want to better understand the impacts of preschool and the drivers of its effectiveness.



This publication summarizes an academic review paper on preschool effectiveness, “Lottery Evidence on the Impact of Preschool in the United States: A Review and Meta-Analysis” by Jesse Bruhn and Emily Emick. The 44 papers summarized fall into three categories: studies of three model preschool programs begun in the 1960s known as “demonstration programs,” studies of four modern-day preschool programs, and studies of 14 experiments comparing preschool characteristics. The included papers use lottery-based designs to determine the causal impacts of preschool. When preschools have more interested students than seats, they use lotteries to determine who gets an offer. This context allows for apples-to-apples comparisons between the outcomes of successful and unsuccessful applicants.

Some consensus emerges from the studies: Preschool generally boosts children’s short-term test scores and cognitive outcomes. These effects fade to varying degrees over time but re-emerge later in life on long-term educational and behavioral outcomes. Evidence on the drivers of these effects and the characteristics of high-quality programs is scarce. Further, the studies reviewed in this publication are limited to a handful of settings, and most rely on data from students who were enrolled more than a decade ago. The following summary shares key findings and highlights areas for future inquiry.



Key Highlights

Three demonstration programs in the 1960s and 1970s randomly divided approximately 350 children into groups who received preschool and those who did not. Findings from these programs have guided policy conversations for years.⁷ Four modern programs – Boston Public Schools universal preschool program, the Head Start Impact Study, Tennessee statewide preschool, and Educare – used lotteries to allocate children to seats.

1. Demonstration programs generate **strong, positive effects on students’ academic outcomes** in the short term that fade over time.
2. The **positive impacts** of demonstration programs **re-emerge in the long term** through improved adult outcomes such as increased high school graduation and reduced teen pregnancy.
3. Modern preschool **boosts short-term test scores**, but these effects decrease over time.
4. Boston’s program is the only modern program where long-term outcomes are available: Boston’s preschool **increased high school graduation and college enrollment rates**.
5. **Sparse evidence** exists on the impacts of modern preschool on **other academic outcomes and behavioral measures**, and existing work is inconclusive.
6. **Limited rigorous research** exists on **which factors lead to high-quality preschool**. Trends from preliminary research suggest that full-day programs, language immersion programs, and specific curricula improve student outcomes.

The demonstration programs generate larger impacts than the modern programs. This difference can be partially explained by the intensity of the demonstration programs and the growth of preschool enrollment. Children who attend the modern preschool programs of interest are more similar to the comparison group (many of whom attend other preschools) than were children in the 1960s and 1970s.

Study Inclusion Criteria

This publication summarizes a review of 44 papers from 21 distinct experiments that analyzed preschool outcomes. To narrow the focus of this review, the researchers included studies if they:

- Conduct a randomized evaluation of early education in the United States;
- Study childhood development during the typical preschool age range (usually 3-6);
- Examine student outcomes;
- Were published in a peer-reviewed journal sometime after 1990; and
- Reported the data necessary to understand the size of impacts.

Why randomized studies?

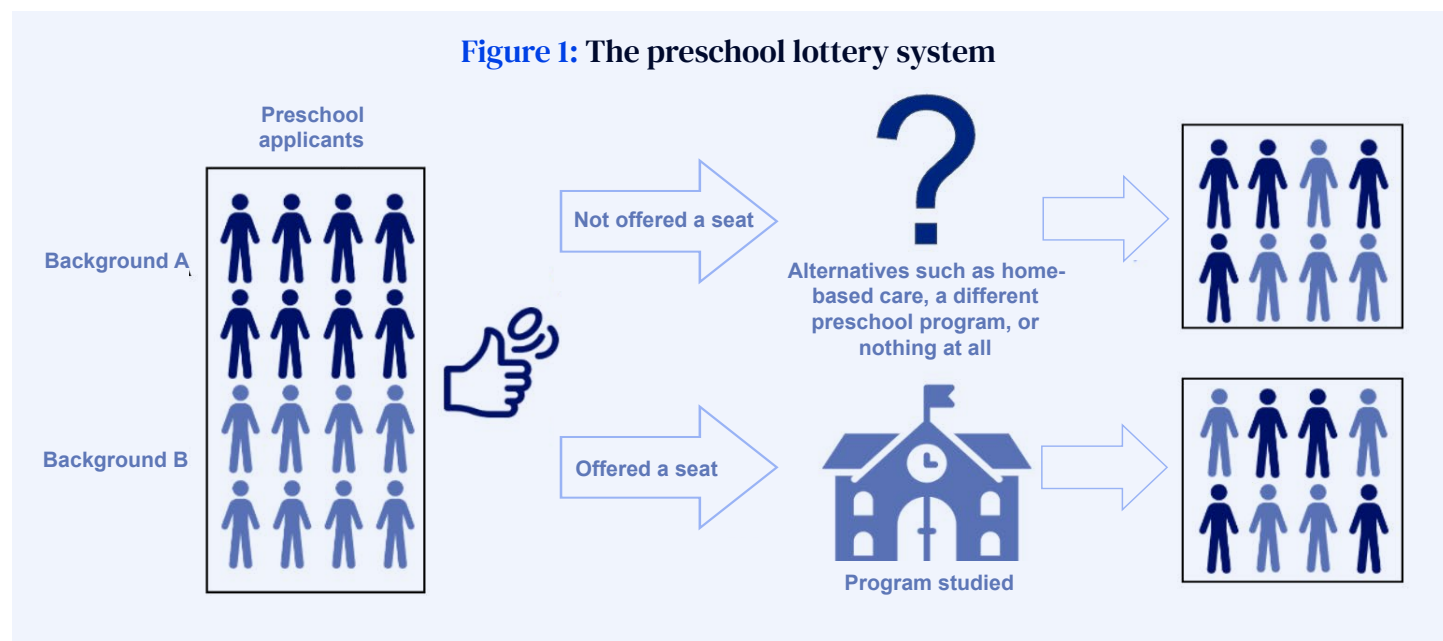
Like randomized trials in medicine, the early childhood education programs considered in this review randomly assign individuals from a particular background to participate in a preschool program or specific intervention (e.g., a smaller class). This randomization allows for an apples-to-apples comparison between systematically similar children who are selected to participate and those who are not.

One type of randomized study is a lottery study. When preschool programs are oversubscribed—meaning they have more interested applicants than available seats—they use lotteries to determine which students receive a seat by randomly choosing among

children with the same preferences and backgrounds. This process, visualized in Figure 1 below, allows researchers to isolate the causal impact of a program.

Randomized studies of preschool remain relatively rare; a recent paper found that among 288 ECE evaluations, just 3 percent use rigorous, lottery-based designs.⁸ While several literature reviews have analyzed preschool studies broadly,⁹ few reviews have focused on this narrow subset of randomized studies. This review dives deeply into a well-defined selection of rigorous preschool research.

Figure 1: The preschool lottery system



Featured Programs

The papers reviewed fall into three categories: demonstration program studies, studies of modern-era programs, and studies of quality drivers.

Demonstration Programs

Three preschool demonstration programs in the 1960s and 1970s have dominated policy conversations for decades. The programs—Perry Preschool, Abecedarian, and Early Training—observed short-term, long-term, and intergenerational outcomes for small samples of primarily Black, disadvantaged children.¹⁰ Collectively, the studies randomly assigned approximately 350 children to either a control group or intensive preschool programming, which often involved home visits and, in the case of Abecedarian, medical care.¹¹

Modern-era Programs

Four modern lottery experiments in the 1990s and 2000s shed light on more recent programs. Many preschool programs—including Boston universal preschool; Tennessee statewide preschool; Head Start programs included in the Head Start Impact Study; and Educare—are oversubscribed, allowing researchers to take advantage of the random, lottery-based assignment process. Across the four studies, researchers analyzed more than 10,000 children and studied such short-term measures as test scores, other academic indicators, and disciplinary outcomes.¹² The study of Boston’s preschool also examined long-term effects, including high school graduation and college enrollment.¹³

Quality Drivers

Fourteen studies evaluate experiments that compare preschool characteristics. Rather than focusing on the impact of preschool as a whole, these experiments randomly vary such factors as professional development, curriculum, and class size to determine which ones improve student outcomes. However, these studies have smaller sample sizes and require strong assumptions that, if false, make conclusions from the studies less reliable than those from the modern evidence studies. That said, the studies of drivers of quality provide valuable insights into the broad patterns that may explain preschool’s long-term benefits.

Table 1 describes the demonstration programs and modern evidence experiments in more detail. The 14 studies of quality drivers are briefly described in Table 2. The outcomes studied in each of the demonstration programs and modern-era programs are delineated in the Appendix.



Table 1: Studies of demonstration programs and modern-era programs

Category	Intervention	Year of intervention	Location	Sample size
Demonstration programs	Perry Preschool	1962-1967	Ypsilanti, MI	123 children
	The Early Training Project	1962-1964	Murfreesboro, TN	65 children
	Abecedarian	1972-1977 1978-1980	Chapel Hill, NC	177 children
Modern lotteries	Boston Universal Preschool	1997-2003 2007-2011	Boston, MA	4,215 children
	Head Start Impact Study	2002-2003	National	4,385 children
	Tennessee Statewide Pre-K	2009-2011	TN (statewide)	2,990 children
	Educare	2010	Chicago, IL Milwaukee, WI Omaha, NE Tulsa, OK	206 children

Table 2: Studies of quality drivers

Category	Intervention	Year of study ¹⁴	Sample size	Findings
Curriculum	Building Blocks mathematics curriculum	2011	1,375 children	Large improvements in math assessment for children enrolled in the curriculum
	Pre-K Mathematics	2008	278 children	Large improvements in math assessment for children enrolled in the curriculum
	Research-based, Development Informed (REDI) curriculum	2008, 2020	356 children	Mixed results on various outcomes for children enrolled in the curriculum
	Second Step Early Learning	2019	770 children	Mixed results on various outcomes for children enrolled in the curriculum
	Literacy Express curriculum (among English Language Learners)	2009	94 children	Small to moderate improvements in outcomes for children enrolled in the curriculum
	Literacy Express curriculum	2011	739 children	Small to moderate improvements in outcomes for children enrolled in the curriculum
Class structure	Full-day program	2019	226 children	Large improvements in academic and social-emotional outcomes for children enrolled in the full-day program
	Class size caps	2019	354 children	Small to moderate improvements in literacy for students in capped classes
Language/immersion	Two-way Spanish immersion program	2007	147 children	Improvement in Spanish language skills and no impact on English language skills for students enrolled in the program
	Transitional bilingual education model	2010	31 children	Improvement in Spanish language skills and no impact on English language skills for students enrolled in the program
Professional development	Book reading & oral language improvement training program	2006	207 children	Mixed results in outcomes for students of teachers who received professional development
	Behavioral problem professional development intervention	2009	509 children	Some significant declines in behavioral issues for students of teachers who received professional development
	2-day workshop & expert coaching on improving literacy	2010	758 children	Mixed results in outcomes for students of teachers who received professional development

Limitations

Besides their many benefits, lottery studies have some limitations. Financial considerations or ethical concerns about randomizing interventions may make a lottery study impossible in certain circumstances.

Furthermore, lottery studies often occur in times, places, and populations that do not generalize to a broader audience. For example, the Perry Preschool demonstration program measured the impact of an intensive preschool program with home visits in the 1960s. Random assignment allows researchers to understand the causal effect of attending this program on students' outcomes. However, the impact of such a preschool program decades ago may not be comparable to a present-day, lower-intensity program. In other words, some lottery studies may not have external validity—the ability to predict outcomes for programs outside the specific circumstances of the study. These two concerns mean that while lottery studies are frequently beneficial, they are not always practical or generalizable.

Findings

Findings from the reviewed literature illustrate preschool's impact on children. Both demonstration programs and modern preschool improve short-term academic outcomes that fade over time. Preschool also boosts students' long-term outcomes, such as high school graduation and college enrollment. While evidence on behavior is less consistent, preschool improves some long-term non-academic outcomes, such as the likelihood of incarceration, particularly in the demonstration program literature. Evidence on quality drivers is thin, though preliminary research finds positive outcomes of full-day programs, immersive language programs, and specific curricula.

Demonstration Programs

A critical question in education policy is whether improvements in short-term outcomes translate into long-term student success. Because the demonstration programs occurred so long ago, they provide insight into preschool's short-term and long-term effects.

Comparing Impact

The 44 studies in this review analyze preschool programs in various contexts and measure preschool's impact on vastly different outcomes, so it can be challenging to compare impacts across studies. For this reason, many studies included in this review measure impact in a unit known as effect sizes. Effect sizes offer a measure of spread that allows us to compare the general impact of different interventions on multiple outcomes, whether those outcomes are measured in probability (such as that of graduating from high school) or points (such as a test score).¹⁴

Effect sizes are calculated differently throughout this review depending on the available data. All effect sizes compare an outcome for a student enrolled in a given program with that of an average student. A simplified interpretation of one measure of effect size, standard deviations, in percentile terms is shown in Table 3 below.¹⁵

Table 3: Interpreting effect sizes

Effect Size	Interpretation
0.10 standard deviations	50th percentile to 54th percentile
0.20 standard deviations	50th percentile to 58th percentile
0.30 standard deviations	50th percentile to 62nd percentile
0.40 standard deviations	50th percentile to 66th percentile

In addition to findings from the 19 studies on demonstration programs, this brief highlights a novel analysis that pools the results of all three demonstration programs. Because the original studies used small sample sizes and often separated the samples by gender, some scholars have considered them unreliable. By using a larger sample, pooling allows us to draw more reliable conclusions from the three studies.

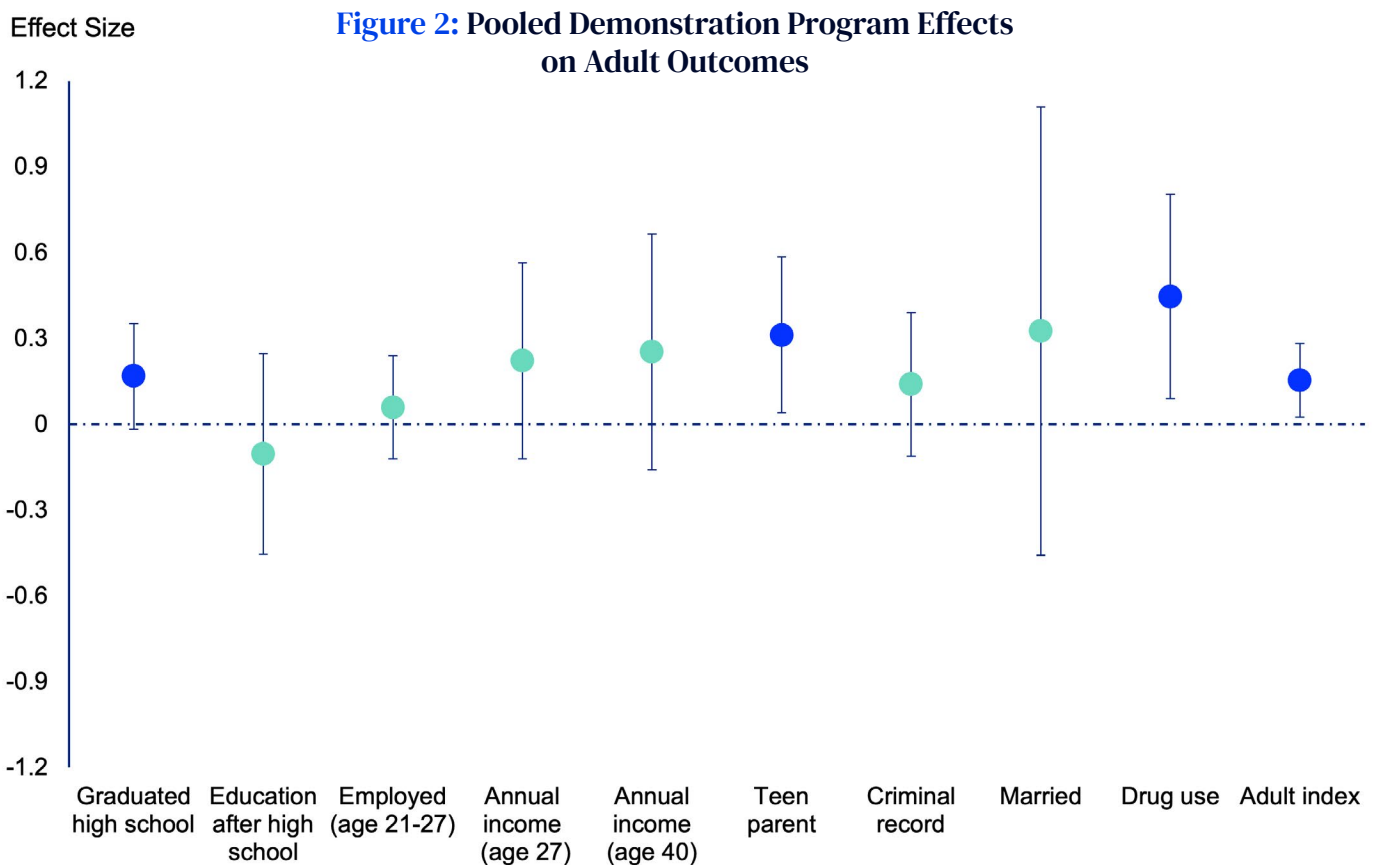
Demonstration programs increase children’s cognitive and academic outcomes in the short term and, to a lesser extent, in the long term.

The demonstration programs greatly increase children’s IQs in the short term. In kindergarten, preschool attendees’ increases in IQ are both statistically significant and large—the pooled effect size across all three studies is 0.69. This effect size is substantial; by contrast, the largest effect size ever published on charter school attendance is 0.359.¹⁷

However, this academic improvement declines over time. By high school, the pooled effect size drops to 0.27—less than half the kindergarten effect size—and the impacts recorded in the individual studies are statistically insignificant. Still, the novel pooled analysis of all three studies shows a statistically significant improvement in high school IQ for students who attended a demonstration program. This finding suggests that the IQ improvement is persistent but declining over time.

Demonstration programs consistently improve students’ long-term success, including academic and behavioral outcomes.

Demonstration program attendance leads to consistent long-term benefits. The pooled analysis shows that students who attend preschool are more likely to graduate high school and less likely to become teen parents or use illegal drugs. They also have a higher “Adult Index,” a measure of adult



How to read this figure: This figure represents the pooled results for several long-term outcomes studied in the demonstration programs, where bright blue points represent statistically significant effect sizes and teal points represent inconclusive effects. Brackets around each point represent a 95 percent confidence interval; points where the brackets straddle the x-axis indicate inconclusive effects. Results are standardized so that all metrics above the x-axis indicate a “better” outcome (i.e., an increase in the probability of graduation and a reduction in drug use would both be above the x-axis).

success drawn from several long-term indicators.¹⁸ Figure 2 summarizes the impacts of preschool attendance on long-term outcomes.

What drives these long-term improvements? Evidence from the Perry Preschool program suggests that long-term benefits connect to behavioral improvements.¹⁹ Students who attended Perry Preschool engaged in less disruptive behavior in the long term, and girls who attended the program experienced improved academic motivation, which persisted over time.²⁰

The children of demonstration preschool students see improvements in health, education, and criminal justice outcomes.

Because the demonstration programs occurred several decades ago, researchers can observe their impact not only on the students who enrolled but also on their children.²¹ Children of students in the Perry Preschool program were more likely to grow up in stable homes with healthier, better-educated parents. The children of Perry Preschool students were also healthier, better educated, and less involved in crime than the children of those not in the program. However, because Perry Preschool students were also more likely to have children later in life, it is difficult to tell how much of this intergenerational effect is due to the preschool programming itself versus the benefits derived from having older parents.

Demonstration Programs Conclusion

Despite their influential findings, the demonstration programs have limited external validity. The studies are limited in their relevance for current preschool discussions due to their unusually intensive nature, their focus on a limited population, and the length of time that has passed since the studies were conducted. Therefore, it may be better to consider them as proof of the “upper bounds” of what an intensive, high-quality preschool program can accomplish, rather than a realistic assessment of what modern preschool programs might achieve.

Modern-era Programs

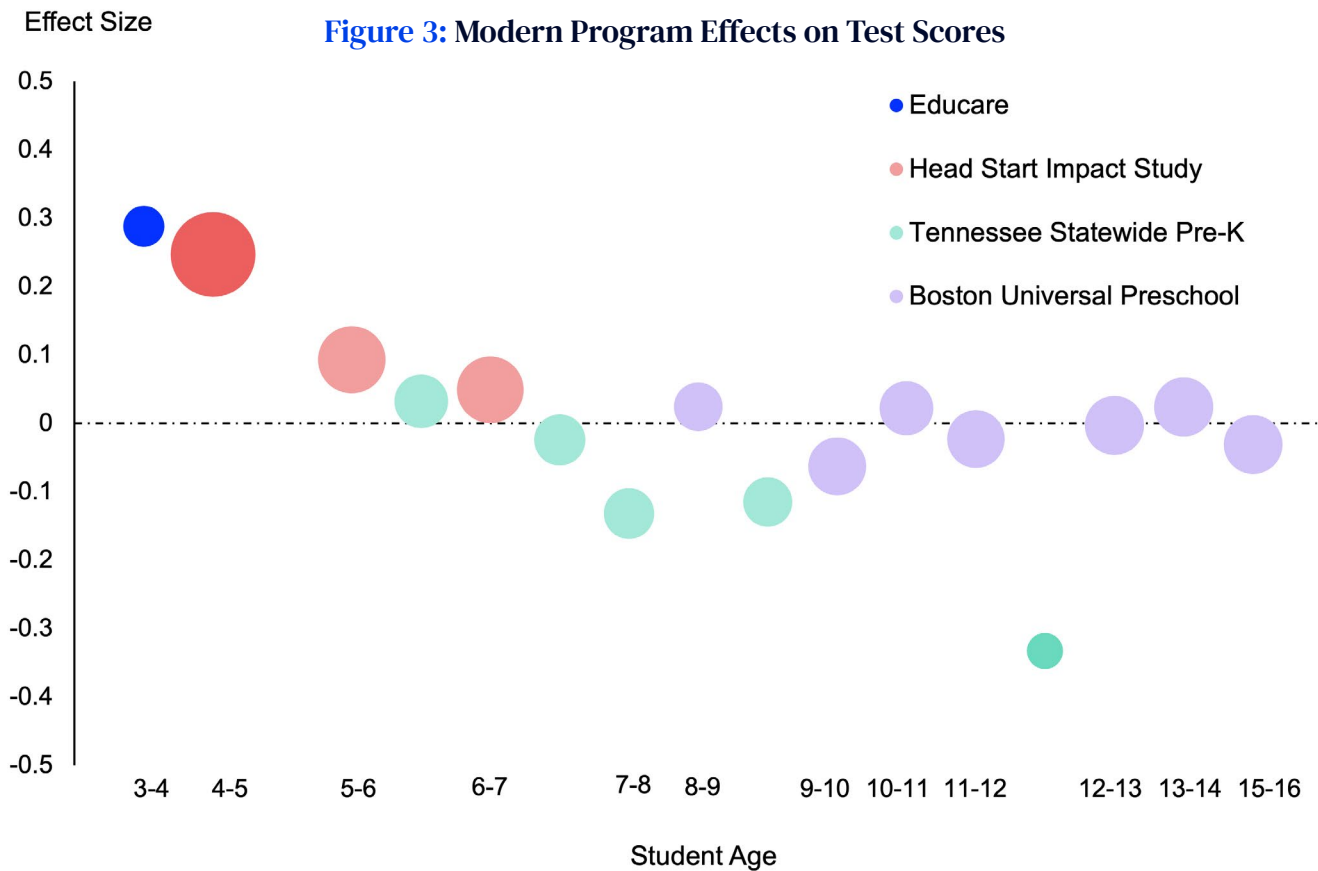
Policymakers need research on modern programs to guide decisions today. The overall trends from modern and demonstration programs are the same, although modern programs generate smaller impacts.

Comparisons between children who did and did not attend these programs may explain the lower modern effects. In the 1960s and 1970s, children not offered seats in the demonstration programs had few alternative early education options and received a mix of at-home and neighborhood-based care. By contrast, children not offered seats in modern programs, such as Boston’s universal preschool, often elected to attend other forms of center-based care like Head Start, which was more widely available by the 1990s. Therefore, the modern Boston students and those not selected to attend Boston’s program are more similar than those accepted to the demonstration programs and their counterparts.²²

Modern-era programs boost short-term test scores.

The four modern experiments examine the impact of preschool attendance on students’ test scores at various ages, as seen in Figure 3. From ages 3 to 6, children who attend preschool have significantly higher test scores than those who do not. However, preschool attendees’ test scores are not significantly higher in subsequent years, suggesting academic improvements decline over time.

Test scores like these, which are currently one of the primary measures of preschool effectiveness, focus on a narrow range of academic skills. They are often expensive to administer and were validated using samples unrepresentative of the full U.S. preschool population.²³ To better measure potential future success, researchers can help develop non-traditional, less biased assessments that measure skills beyond math and reading.



How to read this figure: This figure represents preschool’s impact on test scores for students of various ages in each modern program, which are represented by different colors. Brightly colored circles represent statistically significant effect sizes, and paler circles represent inconclusive effects. The size of the circle is determined by statistical precision, meaning that larger circles represent more reliable results. Positive effect sizes indicate an increase in test scores, whereas negative effect sizes represent a decrease.

The sparse evidence on other academic outcomes and behavioral outcomes is inconclusive.

Non-academic measures, including health and behavioral outcomes, can help build a more holistic understanding of preschool impacts not captured by test scores. These indicators may also help explain how preschool leads to long-term improvements.

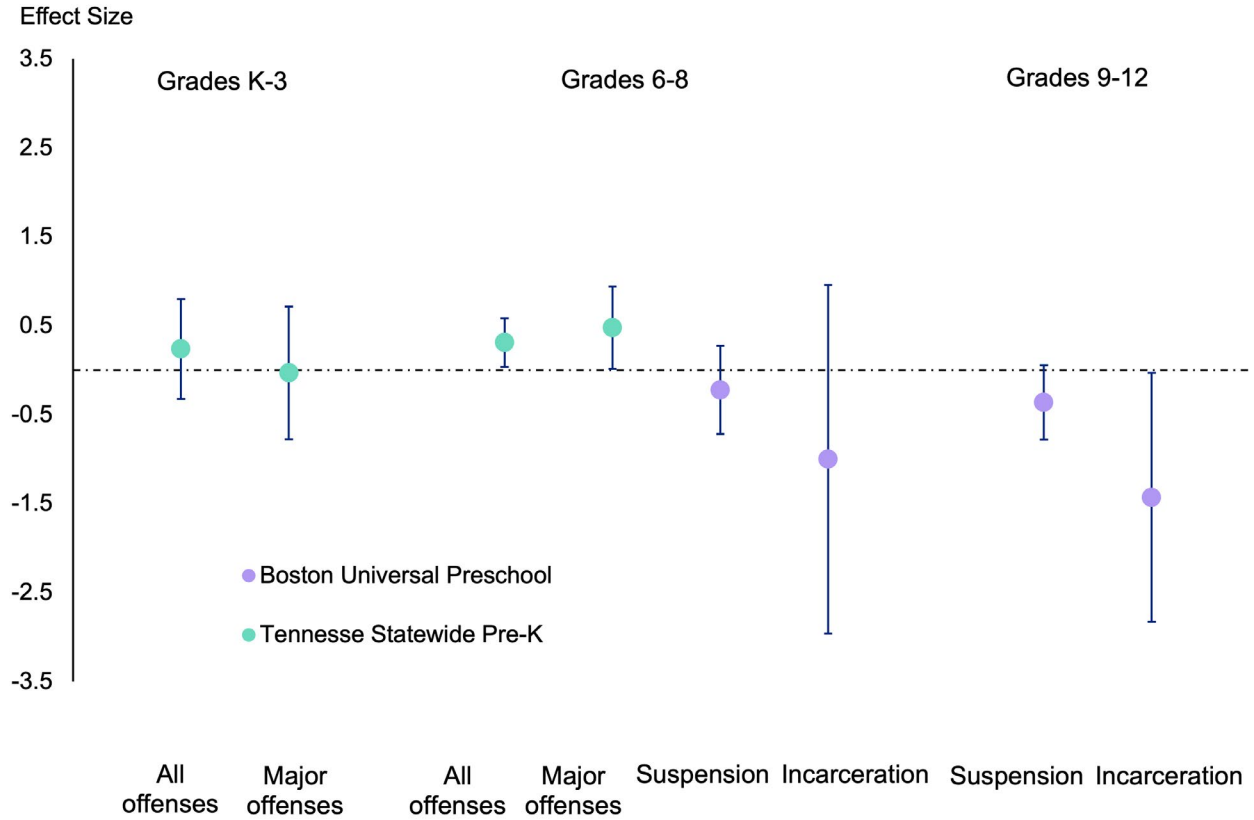
Two modern studies of Boston and Tennessee analyzed several academic and behavioral outcomes beyond test scores with mixed results.²⁴ Preschool attendance did not affect academic outcomes such as absenteeism and academic preparedness. However, the studies found contradictory impacts on disciplinary outcomes, as seen in Figure 4. While Boston preschoolers saw large, significant reductions in juvenile incarceration, Tennessee preschoolers were more likely to commit major disciplinary violations in middle school.

A third study captured the impact of Head Start attendance on parental involvement.²⁵ Parents of students enrolled in Head Start were more engaged with their children. Head Start parents spent more time working with their children on academic activities—such as reading and writing—and on non-academic activities, such as practicing rules and daily routines. These habits persisted beyond preschool.

Modern preschool attendance boosts long-term outcomes, such as high school graduation and college attendance.

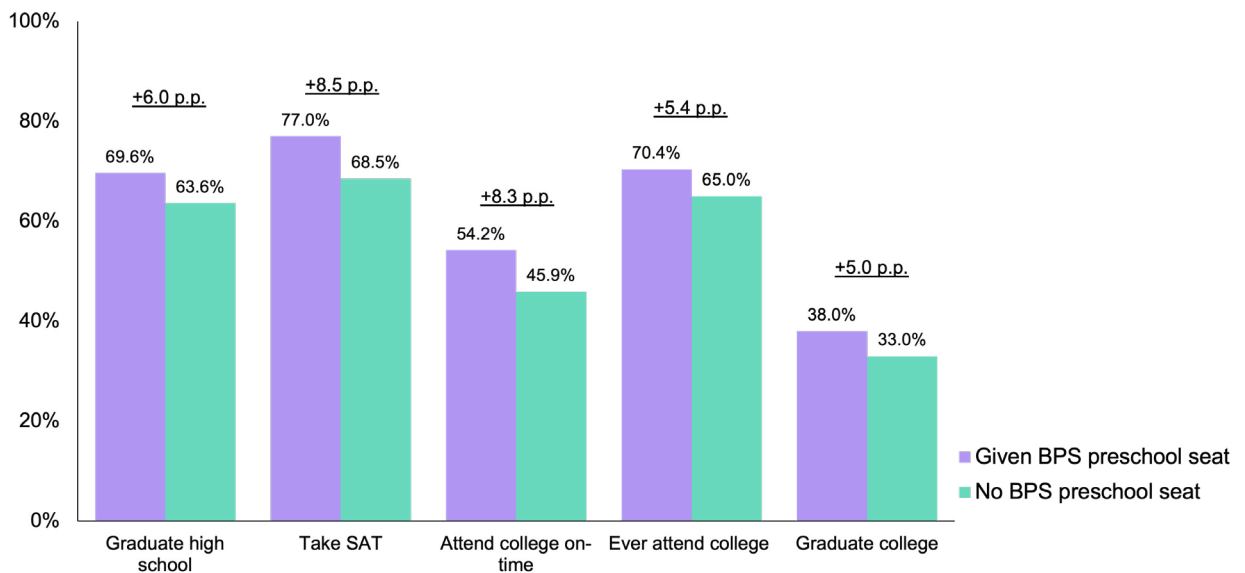
The diminishing impact on test score improvements and inconclusive evidence on other outcomes naturally leads to the question of whether preschool attendance boosts long-term academic outcomes like high school graduation and college enrollment. This is also one of the salient questions facing policymakers today: What role do the early years play in generating lifelong success?

Figure 4: Modern Program Effects on Behavioral Outcomes



How to read this figure: This figure represents preschool’s impact on disciplinary outcomes for students of different grade levels in the Boston and Tennessee programs (Boston is depicted in purple; Tennessee is depicted in teal). Points represent the effect size of preschool’s impact on an outcome. Brackets around each point represent a 95 percent confidence interval; points where the brackets straddle the x-axis indicate inconclusive effects. Positive effect sizes indicate an increase in a disciplinary outcome such as the number of suspensions, whereas negative effect sizes indicate a decrease.

Figure 5: Boston Universal Preschool Effects on Long-Term Outcomes



How to read this figure: The figure compares long-term outcomes for children who randomly won a Boston Public Schools (BPS) preschool seat to those who did not win a seat. For example, lottery winners attending preschool had a graduation rate of 69.6%, six percentage points higher than the 63.6% graduation rate for children who did not receive a high enough lottery number to attend preschool.

Boston’s program is the only modern program where long-term outcomes are available.²⁶ Children randomly selected to attend a Boston public preschool were significantly more likely to graduate high school (six percentage points) and attend college on time (eight percentage points), as seen in Figure 5. Increased college-going was driven by higher enrollment at four-year colleges. In addition, Boston preschool students were nine percentage points more likely to take the SAT. Taken together with the positive behavioral impacts of Boston’s program, ongoing skill formation may culminate in long-term educational attainment. New measures can help uncover the mechanisms that connect preschools’ short- and long-term effects.

Significant variation in quality exists across preschool programs, which may explain some of the inconclusive results.

Contradictory results on non-academic measures from preschool studies may be partly explained by the varying quality of preschool programs. One study measured the variation in quality across several Head Start sites and found that certain sites—such as those that offered full-day programming and home visits—tended to have better test scores.²⁷ For example, preschools with full-day programming also generated large causal effects on students’ test scores. However, the sites did not randomly vary program characteristics. As a result, the study cannot control for other factors that might influence program impact, such as whether preschools with full-day programs hire better teachers. Still, this study draws attention to an important point: Different preschool programs vary in quality, and it is critical to understand which factors drive successful programs.

Modern Program Conclusion

Consistent with the demonstration program studies, modern preschool causes short-term academic improvements that fade over time. Preschool also increases long-term outcomes such as high school graduation and college enrollment, though these outcomes are only studied in Boston. Evidence of impacts on behavioral outcomes is inconclusive. These results call attention to the wide variation in quality across modern preschool programs.

Quality Drivers

Government funding plays a fundamental role in the ECE sector. As preschool expands, standards and regulations for government funding can help foster effective and equitable preschool programs. However, current measures of preschool quality—such as the Classroom Assessment Scoring System (CLASS), the Early Childhood Environment Rating Scale (ECERS), and different states’ quality rating and improvement systems (QRIS)—vary in what they cover.²⁸ For example, CLASS measures preschool quality based primarily on teacher interaction but does not account for curriculum, which ECERS does.²⁹ A unified understanding of which factors drive preschool quality could help guide preschool standards and regulations to foster effective and equitable preschool growth.

This body of research provides insights into general trends in the effectiveness of certain curricula, class structures, language immersion programs, and professional development programs.

Particular curricula may lead to positive effects, but the evidence is scarce.

Curricula based on academic skills such as math and vocabulary may benefit students, whereas the impact of curricula that target behavioral skills is inconclusive. Two studies with large sample sizes found positive impacts of math-based curricula, and two studies found that “Literacy Express”—a curriculum that emphasizes critical language and



early literacy skills—had small to moderate positive effects.³⁰ Conversely, curricula focused on social-emotional learning had mixed results (based on two studies).³¹

Nearly all of these studies face limitations. The studies typically only evaluated outcomes directly related to the curriculum, making it challenging to observe the comprehensive impact on student outcomes, including any potential negative impacts on topics that the curriculum did not directly target (e.g., focusing on math may take time away from literacy). Furthermore, several characteristics typically varied between the curriculum of interest and the alternative curriculum—for example, students may have experienced increases in both small-group instruction and computer-based learning. When the curriculum change coincides with other programmatic changes, it is difficult to isolate the source of improvement.

Some evidence suggests that full-day preschool is more effective than half-day.

Elements of class structure, such as class size and the length of a school day, may also affect preschool quality. Children in one study who attended full-day rather than half-day preschool experienced academic and social-emotional improvements.³² The magnitude of these impacts—with effect sizes as high as 0.487 for literacy—are comparable to those found in similar studies that compare full-day to half-day kindergarten.³³ Some evidence also suggests that smaller class sizes improve preschool literacy scores, though these studies had very small sample sizes.³⁴

Immersive preschool language programs improve students' language skills in the immersion language.

Around one-third of US children aged five and under are dual language learners.³⁵ Immersive preschool language programs may improve their language abilities.³⁶ Several studies randomly enrolled Spanish-speaking preschoolers in immersive Spanish language classes: Those students experienced large gains in their Spanish language acquisition, with little to no impact on their English language skills.

Studies varying professional development programs show inconclusive evidence.

Nationwide, programs are experiencing severe shortages of early childhood educators.³⁷ Amid these shortages, policymakers and preschool leaders must decide what credentials to require and which kinds of professional development to provide educators. The impacts of professional development programs for teachers on student outcomes are inconsistent.³⁸ Several studies randomly enrolled teachers in training programs and workshops to equip them with strategies to target behavioral problems or improve academic skills. The results were largely inconclusive; they showed a mix of positive, negative, and insignificant effects on children's outcomes.

Quality Drivers Conclusion

Given the importance of designing effective preschool programs for ongoing policy decisions, it is critical to understand the findings and gaps in the current literature. Preliminary research suggests that the length of the school day and particular curricula may improve student outcomes, but research on other factors, like professional development, is inconsistent. Little to no randomized research evaluates which teacher qualifications are essential or how specific preschool characteristics affect family outcomes.

Policymakers today need to understand not only the effects of increasing preschool enrollment and access but also how to design effective programs to maximize benefits for children. To further understand quality drivers, researchers should attempt to corroborate promising findings, such as those related to full-day school programs, while examining factors yet to be studied through lotteries, such as teacher quality.

Areas for Future Research

Lottery-based evidence reveals several consistent patterns. Preschool boosts students' test scores and cognitive outcomes. These effects fade over time but re-emerge later in life on diverse outcomes, including long-term educational and behavioral outcomes. Improvements in non-academic skills may be the

driving force behind long-term success. Given what we know, five research areas are critical for equitable and effective scaling of preschool.

- **Quality drivers:** Limited experimental evidence exists on which preschool characteristics make up high-quality programs. Researchers can shed light on how factors like curriculum, physical environment, teacher credentials, teacher-child ratio, and length of the school day drive student success. This research can help policymakers understand which characteristics matter most, leading to the largest gains in student outcomes. Such evidence can also inform preschool quality standards, such as CLASS, ECERS, and states' QRIS.
- **Variation across geography, time, settings, and groups of children:** Current lottery studies focus on only four sites across the country, most of which have changed significantly since the study period. Additional studies should target new geographic areas and settings (e.g., home-based programs, district school seats, Head Start) to generate a more representative evidence base. For preschool to lead to education equity, it is also critical to understand how preschool impacts vary for different groups of children (e.g., by race/ethnicity, family income, disability status, and English language learner status).
- **Alternative short-term outcome measures:** Current measures of preschool effectiveness typically focus on a narrow range of academic skills. These assessments are often expensive to administer and were developed with samples unrepresentative of the children attending preschool in the United States.³⁹ Better assessments can provide a more holistic understanding of preschools' full impacts for all children currently enrolled. New measures can also help reveal the channels that lead to students' long-term success. Researchers can help develop non-traditional, less biased assessments, particularly those that measure skills beyond math and reading. When developing new assessments, it is also important to consider the burden placed on educators to administer them.
- **Access:** Black and Latino children, as well as those experiencing poverty or whose parents are below the median education level, have lower enrollment rates in high-quality preschool settings compared with their white and higher-income counterparts.⁴⁰ Researchers can help policymakers design equitable

systems that allow all children to attend high-quality programs, regardless of their background.

- **Family and workforce impacts:** Preschool not only provides education but also child care.⁴¹ Preschool's impacts on family outcomes, particularly labor force participation, is an essential area of future work. Though this question is outside the scope of the publication summarized here, research on these outcomes could contribute to a more holistic understanding of preschool effectiveness. It could also generate a fuller cost-benefit analysis of preschool.

Amid nationwide preschool expansion, a tremendous opportunity exists for diverse stakeholder groups to come together to make preschool research more rigorous, actionable, and timely. New research-practice partnerships can help answer questions about what works, in what context, for which children, and under which conditions. Answers to these questions will be fundamental to ensure preschool expands in the most evidence-informed and equitable way possible.

About MIT Blueprint Labs

Blueprint Labs is a non-partisan research lab based at MIT that is dedicated to studying pressing problems in education, health care, and the workforce. The MIT Blueprint Labs Education Team studies education systems and policies, coupling groundbreaking research with strong policy partnerships. Our work helps policymakers design more equitable education systems and improve outcomes for children and families.

For Further Reading

This evidence review is an executive summary of work by Jesse Bruhn and Emily Emick: "Lottery Evidence on the Impact of Preschool in the United States: A Review and Meta-Analysis."

A Blueprint Labs study, "The Long-Term Effects of Universal Preschool in Boston," is included in this review.

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Appendix

Demonstration and Modern Program Outcomes

Category	Program	Outcome									
		IQ scores	Standardized test scores	School outcomes	School discipline	Parent interaction	High school graduation and college enrollment	Criminal justice involvement	Health	Labor force	Inter-generational outcomes
Demonstration programs	Perry Preschool	✓	✓	✓			✓	✓	✓	✓	✓
	The Early Training Project	✓		✓			✓			✓	
	Abecedarian	✓	✓	✓			✓	✓	✓	✓	
Modern lotteries	Boston Universal Preschool		✓	✓	✓		✓	✓			
	Head Start Impact Study	✓				✓					
	Tennessee Statewide Pre-K		✓	✓	✓						
	Educare	✓				✓					
	Count	5	4	5	2	2	4	3	2	3	1

Notes: This table shows the outcomes studied in relation to all modern programs and demonstration programs. School outcomes refer to any study of in-school factors such as special education services, attendance, grades, and/or retention. These school outcomes were studied to varying degrees for different programs; for example, only special education services were studied in conjunction with Tennessee Statewide Pre-K, whereas grades, retention, special education services, attendance, and additional outcomes were studied in conjunction with Boston Universal Preschool. Parent interaction refers to any study of parental involvement, parent observations, and/or parent-child interactions.

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