



**QUALITY PRE-K: STARTING EARLY
TO CLOSE ACHIEVEMENT GAPS
AND BOOST STUDENT ACHIEVEMENT**

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Introduction

Research shows that young children’s earliest learning experiences can have powerful long-term effects on their cognitive and emotional development, school achievement, and later life outcomes. Decades of research in brain development and cognitive science have shown that young children are constantly learning and are capable of learning much more than previously believed.¹ Unfortunately, research also shows that many American preschoolers do not have access to high-quality early-learning opportunities, that there are significant disparities in children’s early-learning experiences, and that these disparities result in large achievement gaps even before children enter school. Pre-kindergarten programs that provide high-quality early-learning experiences for young children, followed by full-day kindergarten and other elementary reforms that sustain early learning gains, are a critical tool for improving student achievement and narrowing achievement gaps.

This paper discusses the contribution of early-learning disparities to achievement gaps. It reviews the evidence that high-quality pre-K programs can narrow early-learning gaps and improve education and life outcomes for all children, and explains the key features of high-quality early-learning programs. It also outlines the importance of linking high-quality early-learning programs with quality kindergarten and early-elementary programs to provide a high-quality Pre-K–third grade early-learning experience. And it offers examples of high-quality early-learning and Pre-K–third grade initiatives.

Achievement Gaps Begin Early

Researchers estimate that as much as one-half to one-third of the white-black achievement gap already exists when children start first grade.² Gaps between low-income or low-socioeconomic-status children and their peers are similarly large at this point.³ Many children enter school lacking key language, literacy, pre-math, and social-emotional skills.⁴ Research shows that these gaps begin to emerge as early as 9 months of age.⁵

Gaps in school readiness are the result of disparities in children’s early-learning experiences, both at home and in child-care settings. By age 3, children from the most-disadvantaged families have heard 30 million fewer words than children of professional parents.⁶ Children from low-SES families are more likely to watch TV and less likely to be read to by their parents or caregivers, be taken to zoos or museums, and exposed to other learning opportunities.⁷

Quality Early-Learning Programs Improve Outcomes and Narrow Gaps

Research shows that high-quality pre-K programs (which may include state pre-K, Head Start, and other early-learning and development programs designed to foster young children’s early development and learning to support school readiness) can help compensate for these disparities

and improve school readiness and later educational and life outcomes. Long-term randomized controlled and quasi-experimental studies of children participating in high-quality pre-K and early-childhood-intervention programs—such as the High/Scope Perry Preschool Program, the Abecedarian Project, and Chicago’s Child-Parent Centers—find that these programs have improved students’ learning, increased their education attainment and income as adults, and produced long-term reductions in unemployment, crime, and out-of-wedlock childbearing.⁸ More-recent research has found similar learning gains for youngsters participating in large-scale, publicly funded pre-K programs in Oklahoma, New Jersey, New Mexico, and Tennessee.⁹ These studies find that high-quality pre-K programs benefit all children, but have the greatest impact on disadvantaged and minority youngsters, helping to narrow achievement gaps even as they boost learning for all participants.¹⁰

Yet despite this evidence, many children who need high-quality pre-K experiences still are not getting them. Publicly funded pre-K programs, such as state pre-K and Head Start, have grown over the past decade, but still serve only 40 percent of 4-year-olds and less than 15 percent of 3-year-olds.¹¹ Only 59 percent of the poorest 4-year-olds and 33 percent of the poorest 3-year-olds attend pre-K programs, compared with 90 percent and 70 percent, respectively, of children from affluent families. Children from low-to-moderate-income families are even less likely to attend pre-K, even though many children in this group also face challenges in school. Latino students, who constitute a growing percentage of the population, are less likely than children from other ethnic and racial backgrounds to attend pre-K—some evidence suggests that Latino families may have less access to quality pre-K programs due to a combination of economic, demographic, and other factors.¹²

Even when children do attend pre-K, many are not getting the high-quality preparation they need to later succeed in school. A 2005 study of state-funded pre-K in 11 states found that 57 percent of classrooms ranked in the lowest level of instructional quality and none ranked in the highest level.¹³ A California study that included Head Start, state pre-K, and private preschool classrooms found that 16 percent fail to meet even “adequate” standards of quality, meaning they may be actively harming child development. Only 22 percent were classified as “good” and low-income and minority children were less likely than others to be in such classrooms.¹⁴

Defining Quality in Early-Childhood Education Programs

In order to significantly improve school-readiness outcomes, high-quality early-childhood-education programs must not only provide a nurturing and safe environment; they must also provide intentional, instructionally rich, and developmentally appropriate early-learning experiences for young children. Pre-K quality is typically measured in two ways:

Structural quality measures look at inputs and structural features, such as class size and adult-to-child ratios, teacher qualifications, whether the program has a curriculum, and classroom amenities. High-quality pre-K programs that have been shown to improve learning and life outcomes share common structural features, including:

- A clearly articulated, coherent, and intentional curriculum and educational program designed to cultivate school readiness, with a particular focus on language development;
- Well-educated teachers, typically with a bachelor's degree and training specific to early-childhood education;
- Low teacher-to-child ratios and small class sizes; and
- Collaborative relationships with parents.¹⁵

Research finds that lower adult-to-child ratios, smaller class sizes, and better-educated teachers are correlated with improved developmental outcomes.¹⁶

Process quality measures look at what happens in pre-K classrooms, particularly interactions between adults and children. Process quality is typically measured by trained observers, using tools such as the Classroom Assessment Scoring System (CLASS).¹⁷ These process measures predict children's early-learning outcomes better than structural measures alone.¹⁸

Ultimately, both structural and process measures matter for pre-K quality. Structural quality indicators are more easily measured and mandated, and as a result they tend to be the focus of many pre-K policies. But evidence suggests that it is equally important that policymakers foster and ensure process quality in publicly funded pre-K programs. States or school districts can use a variety of strategies to foster process quality. For example, the federal Head Start program had adopted CLASS as part of its monitoring system for grantees.

Research indicates that the interactions between teachers and children are the most important determinant of pre-K quality and impact on children's learning outcomes.¹⁹ Pre-K teacher quality is assessed using both structural and process measures. Teachers' general education level and specific training in early-childhood education (structural measures) are correlated with improved child outcomes.²⁰ Some studies indicate that pre-K teachers with a bachelor's degree are more effective than those without,²¹ but more-recent studies have called this into question. Observed teacher behaviors and quality of interactions with children (process measures) are better predictors of child learning and development than teacher credentials.²² This does not mean, though, that pre-K teachers' education level does not matter.

Pre-K teachers with any level of previous education can become more effective by receiving professional development, support, and individualized coaching to implement specific teaching strategies and behaviors that have been shown to support young children's learning.²³ Key features of effective instruction for young children include:

- a responsive interaction style between teachers and children (teachers respond to children’s interests, desires, and needs and are not overly restrictive or controlling);
- an emphasis on content that predicts school readiness (language, literacy, math, and social-emotional—research shows that oral language, phonological awareness, print awareness, and self-regulatory skills are particularly predictive of school readiness and later success);
- intentional planning of classroom activities;
- balance of teaching strategies (both direct and indirect instruction); and
- flexible groupings (including large group, small group, and one-on-one, depending on students’ skills and needs and teachers’ instructional objective).

Consultation and feedback specifically targeting teacher-child interactions have also been shown to improve the quality of such interactions.²⁴ Teacher training linked to a specific evidence-based curriculum can also improve instructional quality.²⁵

Measuring Early-Learning Outcomes

Policymakers are increasingly turning to outcome, as well as structural and process quality, measures to ensure the effectiveness of early-childhood investments. Effective early-childhood outcome measures can enable policymakers to better target resources and programs, inform pre-K and kindergarten instruction, and help parents and early-childhood educators better understand the skills children need in order to succeed in school. For example, Maryland adopted a statewide kindergarten-readiness assessment in 1998 to help policymakers evaluate how effectively the state was preparing young children for school. Initial results indicated that a high percentage of Maryland children entered kindergarten lacking key skills, but the percentage of entering kindergarteners demonstrating school-readiness skills has risen by 30-plus points since the assessment was implemented.²⁶ Maryland policymakers have used data from this assessment to inform policy and investment decisions. The assessment also helped provide both early-childhood educators and parents with a clearer understanding of what skills children need to be ready for school, so that they could better support children in developing them.

Measuring early-learning outcomes is crucial, but challenging. Rather than traditional pencil-and-paper tests, which are inappropriate for young children, measures of early-learning outcomes (such as Maryland’s kindergarten-readiness assessment) typically rely on structured observations by kindergarten teachers, other trained adults, and in some cases parents, using a defined, valid, and reliable tool.²⁷ Early-childhood educators and kindergarten teachers require training, support, and time to administer these assessments appropriately.

Measures of early-learning outcomes are most useful in providing information about population-level trends and state- or district-wide program effectiveness. Such measures should never have

high-stakes for individual children. Because young children’s development is highly variable and the types of assessments that are appropriate for them tend to yield less reliable results than measures used with older children, policymakers must also exercise caution when using early-learning outcome measures to evaluate the effectiveness of teachers and other early-learning providers; they should use outcome information only in combination with process and structural quality indicators.

In addition to kindergarten entry and other outcome assessments, high-quality early-childhood programs use ongoing, developmentally appropriate formative assessments—both formal and informal—to track children’s progress and inform instruction and program improvement. Effective programs also use appropriate screenings to identify children with health or developmental needs that may require additional services.²⁸

Pre-K Costs

High-quality pre-K programs are not cheap. Environmental and structural features linked to pre-K quality—well-educated teachers, small class sizes, facilities designed specifically to meet the needs of young children—cost money. Estimates vary,²⁹ but in general, policymakers should assume that per-pupil costs for high-quality full-day pre-K are roughly comparable to those for K–12 public schools.³⁰ Many existing state pre-K programs do not spend enough money to match the outcomes of the most-effective programs.³¹ That said pre-K results are a matter not simply of how much is spent, but of how resources are used. Programs can produce improved results without matching the resources of the highest-spending programs.

Research suggests that the benefits of quality pre-K programs—in terms of improved student learning and life outcomes—are sufficient to justify the high costs. Studies of high-quality pre-K programs estimate that over the course of children’s lives, these programs save the public between \$3 and \$10 for every \$1 spent, because students who attend pre-K are less likely to be held back a grade, placed in special-education, or participate in criminal activity, and have increased educational attainment and earnings as adults.³² Although many of these savings do not occur until children reach adulthood, 75 percent of the costs of pre-K programs are recouped while children are in the K–12 school system, in the form of reduced grade retention and special-education placement.³³

Figure 1: Savings per \$1 Spent on Pre-K

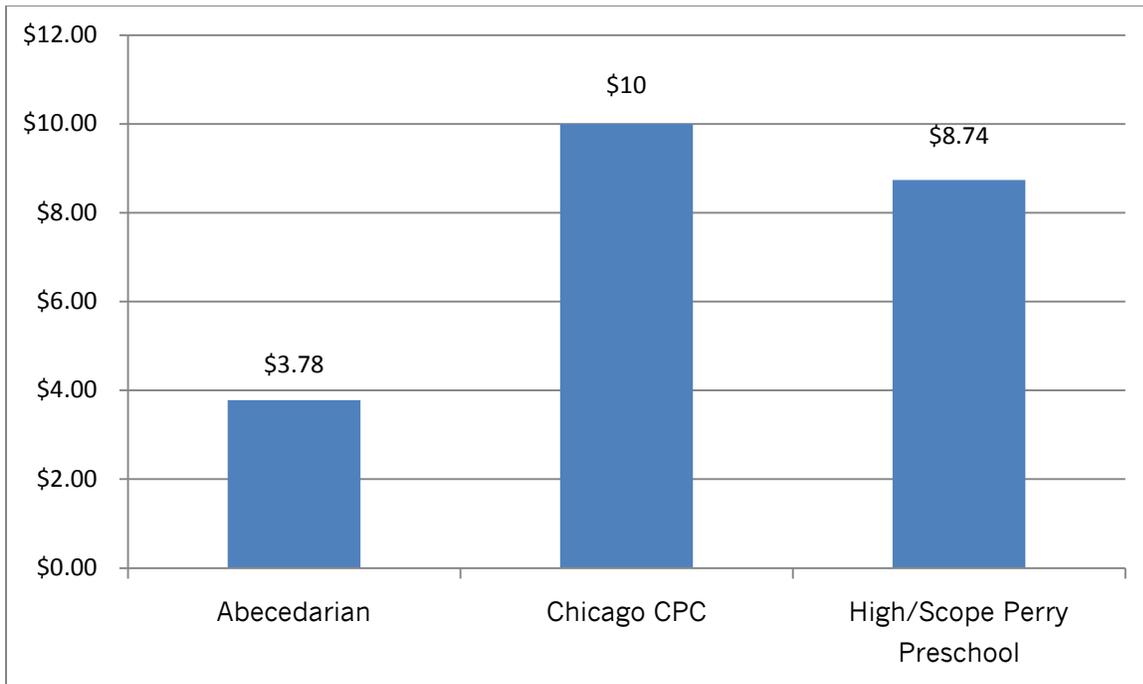


Figure 1: This chart shows the average return per dollar spent on early-childhood services for three high-quality, well-evaluated model initiatives. Benefits include savings to taxpayers and advantages for children participating in the program and for society at large.

Pre-K programs are typically funded through state general revenues or local education funds (including general revenues and dedicated bond levies), or a combination of both. Some states use dedicated “sin taxes” to fund pre-K, but these do not always provide a stable source of funding. Policymakers can supplement state or local investments by employing strategies that combine, or support providers to combine, pre-K funds with subsidized child care or federal Head Start funds to offer a higher-quality or full-day program to participating children. In addition, school districts can use federal Title I funds to support pre-K or full-day kindergarten programs.³⁴

Full-Day Versus Half-Day Pre-K and Kindergarten

Both half- and full-day pre-K programs have positive effects on children’s learning, but full-day programs generate greater learning gains than half-day programs. Children who spend two years in pre-K (at ages 3 and 4) make greater learning gains than those who attend for only one year.³⁵

Similarly, research on full-day kindergarten programs shows that children participating in these programs make more progress in reading and math during the kindergarten year than those in half-day programs.³⁶ Roughly 60 percent of American kindergartners currently attend full-day programs. Full-day kindergarten and pre-K cost more than half-day programs (although they are not twice as expensive), but the benefits of increased learning gains may justify the costs.

Full-day kindergarten and pre-K, as well as an additional year of pre-K, are particularly beneficial for disadvantaged students, many of whom enter pre-K or kindergarten with deficits in school readiness. Full-day programs also have lower rates of absenteeism and eliminate barriers for families (particularly low-income families) who need full-day care while parents work.³⁷ In light of this, states or districts with limited resources should first target full-day or two-year pre-K services, as well as full-day kindergarten, to low-income or other high-need children.

Sustaining Gains

High-quality pre-K can be effective in improving children’s skills upon school entry, but to ensure gains are sustained, it is important to link high-quality pre-K with effective elementary schools, creating an aligned PreK-3rd learning experience. Features of aligned PreK-3rd experiences include:

- high-quality pre-K for 3- and 4-year-olds;
- full-day kindergarten;
- standards, curriculum, and instruction that are aligned both vertically (grade-to-grade in a seamless progression) and horizontally (standards, curriculum, instruction, and assessment strategies are aligned with one another in each grade, and instructional approaches and content are aligned across all classrooms within a grade to ensure common learning experiences for all students);
- shared planning, data analysis, and professional development for PreK-3rd teachers;
- leadership that prioritizes quality instruction for all children in the early years and allocates resources to support effective and aligned instruction; and
- effective family-engagement strategies.³⁸

A number of states, school districts, and charter schools have taken steps to provide a high-quality, aligned PreK-3rd learning experience for their students. New Jersey, for example, provides high-quality pre-K for all 3- and 4-year-olds in the state’s low-income “Abbott Districts,” and has worked to link these early-learning investments with research-based early-literacy initiatives in the younger grades. New Jersey’s approach establishes common standards for all teachers in pre-K and the early elementary grades, and the state has developed guidelines and support to ensure quality in kindergarten classes—which are often overlooked by both early-childhood and K–12 school-reform efforts.³⁹ Montgomery County, Maryland, has also worked to build an aligned, high-quality PreK-3rd experience for students in low-income parts of the district

by investing in full-day pre-K and Head Start, building partnerships with community and social services for young children, providing shared professional development to Pre-K–3rd teachers, and establishing reading by third grade as a key goal and indicator for the district’s reform and accountability plans.

Parent Education

As their children’s first teachers, parents have tremendous impact on early-learning outcomes. Most effective pre-K and early-childhood-education programs include strategies for engaging and supporting parents as partners in children’s learning.⁴⁰

Researchers have identified a handful of family-focused interventions, including the Nurse Home Visiting Program, that deliver improved child and family outcomes on a number of measures, including health, positive parenting, reduction in child maltreatment, and in some cases child development.⁴¹ These programs tend to focus on very-high-need families and have both high intensity of services and well-trained staff. But the broader evidence of the impact of parenting programs on school readiness is mixed and modest.⁴² Programs that improve parent knowledge and attitudes do not necessarily translate into improved outcomes for children.⁴³ Parent-engagement or education programs that serve children only indirectly through their parents typically do not have the same impact on school readiness as those that serve children directly.⁴⁴ In light of this evidence, with the exception of the highest-need families who need intensive support in their children’s first years of life, programs that serve children directly should be a higher priority for limited resources than those that focus primarily on parents.

Examples of Effective Early Childhood Programs

As stated above, several state pre-K programs have demonstrated effectiveness in improving student-learning outcomes. Pre-K programs can be delivered in a variety of settings, including community-based child care, Head Start programs, and public schools. There is no evidence that a specific type of pre-K provider is better or more effective than another. Three examples illustrate that with well-designed programs and supports, pre-K programs can improve children’s learning in a variety of contexts and settings.

New Jersey’s Abbott Pre-K program provides universal pre-K to more than 40,000 3- and 4-year-olds in 31 high-poverty school districts. Structural features of Abbott include teachers with a bachelor’s degree and Pre-K–third-grade certification, small class sizes and low adult-to-child ratios, and mandated use of state-approved, developmentally appropriate, and research-based curricula. Abbott ensures quality across diverse school- and community-based providers through the use of quality guidelines, observational quality measures (the Early Childhood Environmental Ratings Scale) in all programs, trained master teachers who provide professional

development, and collection of a variety of types of data to inform ongoing improvement.⁴⁵ High-quality evaluations find that children participating in Abbott pre-K make significant gains in language, early literacy, and math skills, and that these gains persist through the end of second grade.⁴⁶ Although Abbott spends more per pupil than typical state pre-K programs, the strategies and data it uses to drive ongoing program improvement can be replicated in programs with fewer resources.

AppleTree Early Learning Public Charter School, in Washington, D.C., provides high-quality, full-day pre-K to 3- and 4-year-olds. AppleTree's educational model includes qualified teachers and a low adult-to-child ratio (each 20-student classroom has three adults, two of whom must have bachelor's degrees), ongoing teacher professional development, regular monitoring of children's performance, tiered instruction, and an evidence-based curriculum designed to develop children's language, emergent literacy, cognitive, and social-emotional skills. Children attending AppleTree make statistically significant gains in language, mathematics, and literacy skills, closing the achievement gap for children entering the program with significant deficits in early language, literacy, and math skills.⁴⁷ AppleTree is currently developing a set of curricula and professional-development resources, called Every Child Ready, that will allow other programs, including those with fewer resources, to replicate core components of its educational model.

Both AppleTree Early Learning Public Charter School and Abbott Pre-K benefit from high levels of funding and resources. But less resource-intensive programs in existing child-care and early-education settings can also produce positive results.

Texas School Ready! is a quality-improvement strategy that works across all three sectors of programs serving Texas preschoolers: state funded pre-K (delivered mostly in public schools), Head Start, and center-based child care. TSR has four core elements: a research-based curriculum and materials; professional development; coaching and mentoring; and progress monitoring. Research shows that teachers' participation in TSR's training produces meaningful improvement in the quality of early-learning experiences that they provide. Children whose teachers participated in all four TSR components made gains in vocabulary, letter knowledge, print awareness, and phonological awareness that were significantly greater than those for children in a control group.⁴⁸ TSR leverages existing resources by working in Head Start and child-care classrooms. The TSR intervention costs approximately \$23,000 per classroom over four-years, with roughly half the costs occurring in the first year and phasing out over time. After four-years, the only cost to sustain TSR is a \$200–\$300 licensing fee for progress-monitoring software.

Conclusion

Evidence clearly indicates that the learning that occurs in children’s early years has long-term impacts on their educational and life outcomes, and that investments in early-learning programs can yield long-term benefits—particularly for low-income students. To yield the greatest benefit, early-childhood-education programs must be of high quality: they must provide adequate resources, employ highly skilled teachers who know how to promote young children’s learning and development, emphasize content that predicts school readiness, utilize appropriate instructional techniques, foster productive interactions between teachers and children, and utilize ongoing assessment to monitor children’s progress and target resources and strategies accordingly. To sustain and maximize early-learning gains, quality pre-K or early-learning programs must also be linked with quality kindergarten and elementary programs that ensure an aligned, high-quality Prek-3rd learning experience for young children. States and communities can improve access to and quality of early-learning experiences in a variety of ways, and the most effective approach for a given state or community will vary based on demographics and needs; available resources, and existing infrastructure, capacity, and community resources. State or district policymakers must carefully consider both their own context and the body of existing research to identify the strategies that are most likely to result in improved early-learning outcomes.

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http://www.appliedsurveyresearch.org/projects/KSRA_2008/reports/Report_ALongitudinalAnalysis.pdf; “Getting Ready: The 2010–11 Maryland School Readiness Report” (Baltimore: Maryland State Department of Education, 2011), http://www.marylandpublicschools.org/msde/newsroom/publications/school_readiness.

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⁶ Betty Hart and Todd Risley, *Meaningful Differences in the Everyday Experiences of Young Children* (Paul H. Brookes Publishing Company, 1995).

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- ¹⁰ Gormley and Phillips, 65–82
- ¹¹ W. Steven Barnett et al., “The State of Preschool 2010” (New Brunswick, NJ: National Institute for Early Education Research, 2010).
- ¹² W. Steven Barnett and Daniel J. Yarosz, “Who Goes to Preschool and Why Does It Matter?” (New Brunswick, N.J.: National Institute for Early Education Research, 2007).
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- ³⁰ Costs in half-day programs are lower. One might assume that costs in half-day pre-K are half as much as those in full-day pre-K, but this may vary depending on local factors. In communities where transportation costs are high, half-day kindergarten may cost more than half as much as full-day kindergarten because the district or provider must still pay to transport all children, and safely transporting preschool-age children is costly.

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- ³¹ Barnett et al., *The State of Preschool 2010*.
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- ⁴¹ U.S. Department of Health and Human Services, “Home Visiting Evidence of Effectiveness” <http://homvee.acf.hhs.gov/>; John Eckenrode et al., “Long-Term Effects of Prenatal and Infancy Nurse Home Visitation on the Life Course of Youths: 19-Year Follow-up of a Randomized Trial” *Archives of Pediatric & Adolescent Medicine* 164, no. 1 (2010):9–15.
- ⁴² Deanna S. Gomby, Patti L Culross, and Richard E. Behrman, “Home Visiting: Recent Program Evaluations—Analysis and Recommendations,” *Future of Children* (Spring/Summer 1999).
- ⁴³ Ibid.
- ⁴⁴ Bowman, Donovan, and Burns, 148; “Making Investments in Young Children: What the Research on Early Care and Education Tells Us” (National Association of Child Advocates issue brief, December 2000).
- ⁴⁵ Mead.
- ⁴⁶ Ellen Frede, Steven Barnett, Kwanghee Jung, and Alexandra Figueras, “The APPLES Blossom Interim Report” (New Brunswick, NJ: National Institute for Early Education Research, 2009), http://nieer.org/pdf/apples_second_grade_results.pdf.
- ⁴⁷ Craig T. Ramey and Nancy Crowell, “The AppleTree Approach to School Readiness: A Case Study Using a Longitudinal Population-Referenced Evaluation Framework” (Washington, DC: AppleTree Institute for Education Innovation, 2010), <http://www.appletreeinstitute.org/files/doc/AppleTreeApproach.pdf>.
- ⁴⁸ Landry et al.

ABOUT SARA MEAD

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ABOUT STAND FOR CHILDREN LEADERSHIP CENTER

Stand for Children Leadership Center is a 501(c)(3) nonprofit that provides leadership development and training to everyday citizens. Our mission is to ensure that all children, regardless of their background, graduate from high school prepared for, and with access to, college and career training. To make that happen, we:

- Educate and empower parents, teachers, and community members to demand excellent public schools.
- Advocate for effective local, state and national education policies and investments.
- Ensure the policies and funding we advocate for reach classrooms and help students.

Learn more at www.stand.org