COLORADO CHILDREN'S CAMPAIGN
Every Chance for Every Child

Key Points About the Long-Term Impact of Quality ECE

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Early childhood is a key period of development, with long-term implications for children's later success:

- The early childhood period (birth to age 5) is a time of rapid brain development, with one million new connections forming every second. Early experiences play a large role in determining how brain connections are formed and in the "wiring" that becomes the foundation upon which all later learning is built.[1]
- The learning gap between advantaged and at-risk children exists as early as 9 months of age. At-risk children can start kindergarten as much as 18 months behind their peers. Many of these children never catch up, and are at an increased risk of dropping out of high school.[2]

Evidence-based early childhood programs help children succeed:

- **Oklahoma:** Studies of the Tulsa pre-K program have repeatedly shown substantial short-term gains in school readiness, including big gains in pre-reading and pre-math skills. A study of 8th grade students found some persistence of these gains over time, particularly for math test scores and not being held back in school.[3] By age 18 or 19, the pre-K program decreased the likelihood that black children were charged with a misdemeanor or felony crime.[4] In a different study of the Tulsa Head Start program, participants had higher state test scores in math in 7th grade and were 31 percent less likely to be held back and 34 percent less likely to be chronically absent by 8th grade.[5]

- **North Carolina:** North Carolina's Smart Start and NC Pre-K programs improved young children's reading and math skills in fifth grade. Children in counties that spent more per child were two months ahead in reading and 1.5 months ahead in math by fifth grade when compared with children in counties that spent less.[6]

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[1] Center on the Developing Child Harvard University (n.d.). Brain architecture https://developingchild.harvard.edu/science/key-concepts/brain-architecture/

[2] Barnett, W.S., Tarr, J.E., Lamy, C.., & Frede, E.C. 2001.Fragile lives, shattered dreams: A report on implementation of preschool education in New Jersey's Abbott Districts. New Brunswick, NJ: National Institute for Early Education Research.

[3] Gormley, W. T., Phillips, D., & Anderson, S. (2017). The effects of Tulsa's pre-K program on middle school student performance. Journal of Policy Analysis and Management. http://onlinelibrary.wiley.com/doi/10.1002/pam.22023/abstract

[4] Smith, A. (2015, September). The Long-Run Effects of Universal Pre-K on Criminal Activity. http://www.sole-jole.org/16422.pdf

[5] Phillips, D. A., Gormley, W. T., Anderson, S., (2016, August). Do the positive effects of Tulsa's Head Start program persist through middle school? http://www.documentcloud.org/documents/3023268-CROCUSPolicyBriefAugust2016-1.html

[6] Dodge, K. A., Bai, Y., Ladd, H. F. & Muschkin, C. G. (2016). Impact of North Carolina's early childhood programs and policies on educational outcomes in elementary school. Child Development. https://www.ncbi.nlm.nih.gov/pubmed/27859011

- **Arkansas:** An evaluation of the Arkansas Better Chance program found that children who attended pre-K developed an extra four months worth of vocabulary knowledge, beyond the gains that would be expected as a child naturally ages. Pre-K attendance also resulted in 23 percent more correct answers on a literacy test and improved math scores. Benefits persisted through 2nd grade for literacy, language and math, and through 3rd grade for literacy. In addition, children who attended the program were less likely to be held back in school by the end of 3rd grade than those who didn't attend any pre-K.[7]

- **Georgia:** The Georgia Pre-K program had positive effects on children's early literacy skills, math skills and general knowledge. Poor children also had sustained benefits through elementary school in reading and English language arts, were less likely to be held back in school, and outperformed children who did not attend pre-K on some measures on 9th grade achievement.[8]

- **New Jersey:** An evaluation of New Jersey's pre-K program found that children who attended the program significantly outperformed similar children who did not attend and that these differences persist at least through 4th or 5th grade. In 4th or 5th grade children who had attended New Jersey pre-K for two years were three-quarters of an academic year ahead of their peers who did not attend in math and two-thirds of an academic year ahead in literacy. Pre-K also reduced the likelihood of being held back in school by 40 percent and the likelihood of receiving special education services by 31 percent.[9]

- **Michigan**: Participants in Michigan's state pre-K, the Great Start Readiness Program, were held back in school 51 percent less often than non-participants and had a 35 percent increase in high school graduation rates.[10]

- **Massachusetts**: Boston's pre-K program improved mathematics, literacy and language skills among participating children equivalent to seven months of additional learning, compared with children who did not attend.[11]

High-Quality Early Education Yields a Strong Return on Investment:

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[7] Jung, K., Barnett, W. S., Hustedt, J. T., Francis, J. (2013, May). Longitudinal effects of the Arkansas Better Chance Program: Findings from first through fourth grade. http://nieer.org/wp-content/uploads/2016/08/Arkansas20Longitudinal20Report20May2013n.pdf

[8] http://www.onlineathens.com/article/20111104/NEWS/311049985

[9] Barnett, W. S., Jung, K., Youn, M., & Frede, E. C. (2013, March 20). Abbott Preschool Program longitudinal effects study: Fifth grade follow-up. New Brunswick, NJ: National Institute for Early Education Research. http://nieer.org/research-report/201311apples205th20grade-pdf

[10] Michigan Great Start Readiness Program evaluation 2012: High school graduation and grade retention findings. Retrieved from http://bridgemi.com/wp-content/uploads/2012/06/GSRP-evaluation-may-21-12.pdf

[11] Weiland, C., & Yoshikawa, H. (2013). Impacts of a prekindergarten program on children's mathematics, language, literacy, executive function and emotional skills. Child Development. http://onlinelibrary.wiley.com/doi/10.1111/cdev.12099/abstract

A well-respected, independent cost-benefit analysis of nearly 20 different studies of state and local pre-K programs showed that pre-K can return, on average, a "profit" (economic benefits minus costs) to society of more than $34,000 for every child served.[12]

A recently published analysis of the most comprehensive, high quality experimental and quasi-experimental studies of the impact of early childhood education conducted between 1960 and 2016 found that, on average, participation in ECE leads to statistically significant reductions in **special education placement** (-8.1 percentage points), **grade retention** (-8.3 percentage points), and increases in high school **graduation rates** (+11.4 percentage points).[13]

The Impact of PreK in Colorado

1. **The long-term impacts of quality early care and education programs represent one of the best strategies to reduce several of the core cost drivers in Colorado's education and health systems.**
   - National findings mirror year after year of annual analyses of Colorado's own state-funded pre-K program (the Colorado Preschool Program; see figures below) which improves student performance on standards-based assessments, reduces the probability of being identified with a Significant Reading Deficiency under the READ Act, and reduces early elementary grade retention.[i]
   - Participants in quality early learning programs show substantial improvements on test scores early in life.[ii] In adulthood, these same students are more likely to complete high school, attend college, and even have better health outcomes. [iii] They are less likely to have been charged with a crime or become a teenage parent.[iv] The returns from quality early care and education have been estimated to be 7 percent to 13 percent per year.[v] Study after study highlights the long-term cost savings of investing in high quality early learning programs (see The Abecedarian Project,[vi] the High/Scope Perry Preschool study, etc.).[vii]
   - For example, a recent analysis of the Chicago Child-Parent Center study estimated $48,000 in benefits to the public per child from a half-day public preschool for at-risk children. Participants at age 20 were estimated to be more likely to have finished high school—and were less likely to have been held back, need remedial help or have been arrested. The estimated return on investment was $7 for every dollar invested (National Institute for Early Education Research).[viii] In addition, a recent research brief from Ready Nation summarizes the abundance of research illustrating both the short and long-term benefits investments in early childhood.[ix] In short, high quality early care and education is a key component to addressing the challenges our schools face in preparing tomorrow's workforce for success.

[12] Washington State Institute for Public Policy. (2017). Benefit-cost results. http://www.wsipp.wa.gov/BenefitCost

[13] http://journals.sagepub.com/stoken/default+domain/ycdsVk2Xu4vSV8gxECVS/full

- Additional consensus statements by a wide range of academics highlight the impact of pre-K and the conditions that support long-term gains in children's achievement:
    - https://www.brookings.edu/research/puzzling-it-out-the-current-state-of-scientific-knowledge-on-pre-kindergarten-effects/
    - https://www.fcd-us.org/assets/2013/10/Evidence20Base20on20Preschool20Education20FINAL.pdf
    - https://sites.google.com/site/ececonsensusletter/

Figure 13: Percentage of Students with a Significant Reading Deficiency in 2016

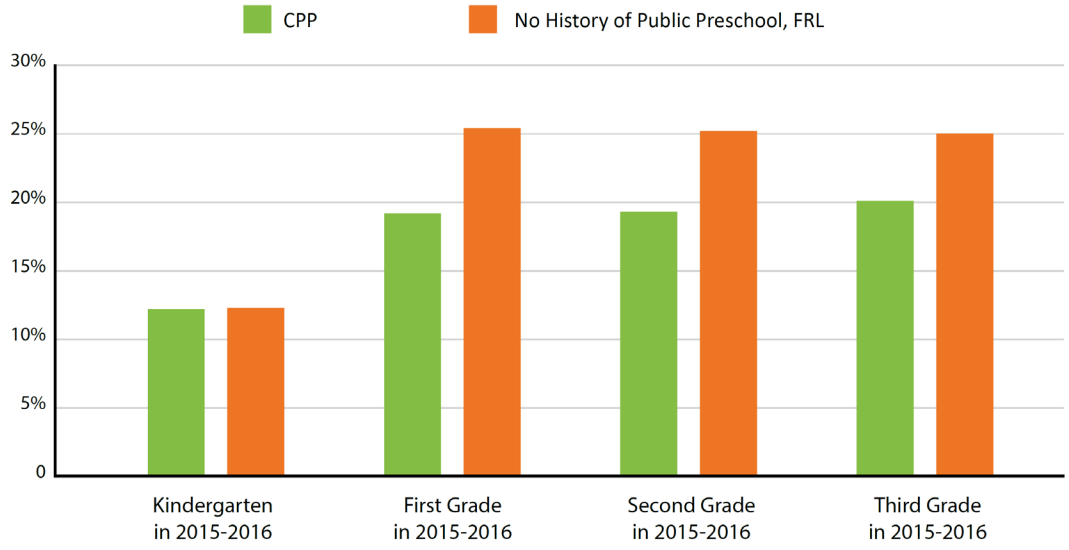


Figure 16: 2017 CMAS Results

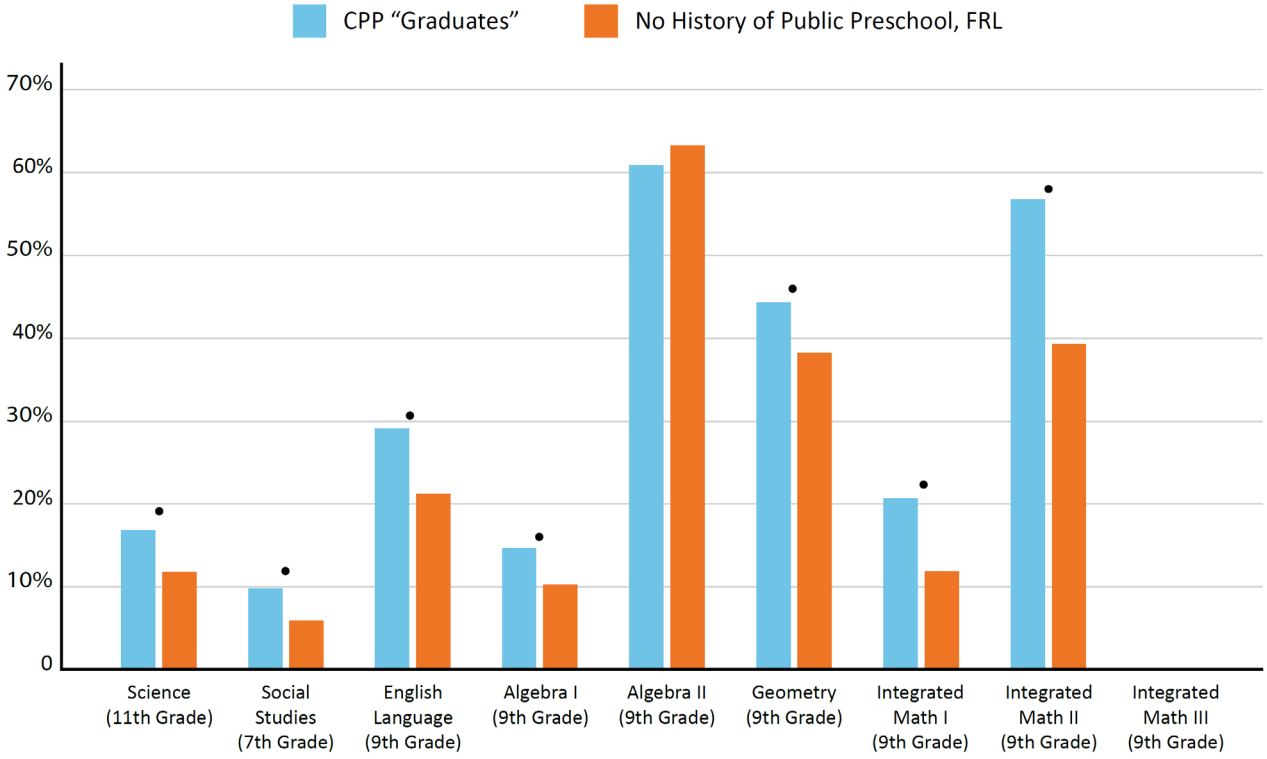
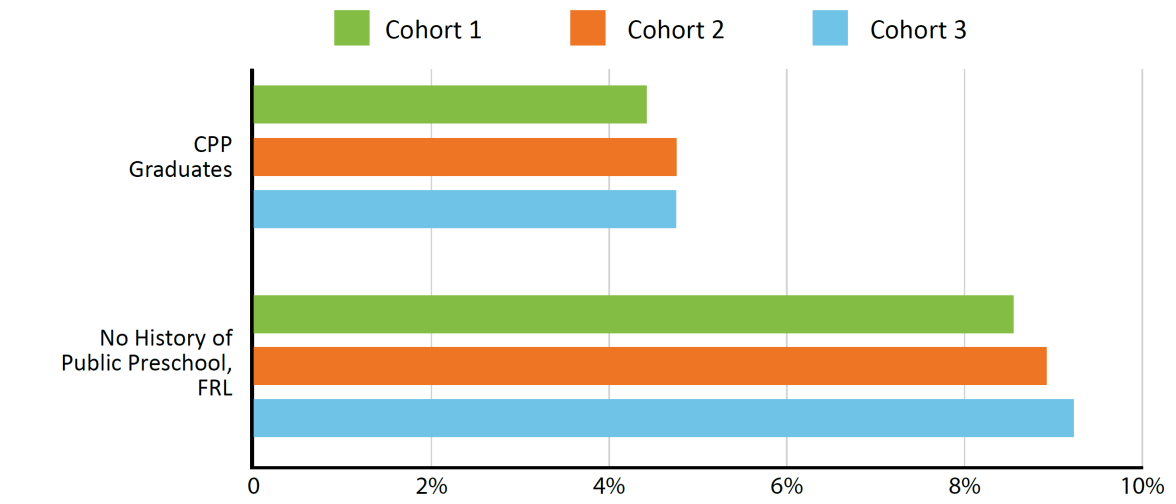
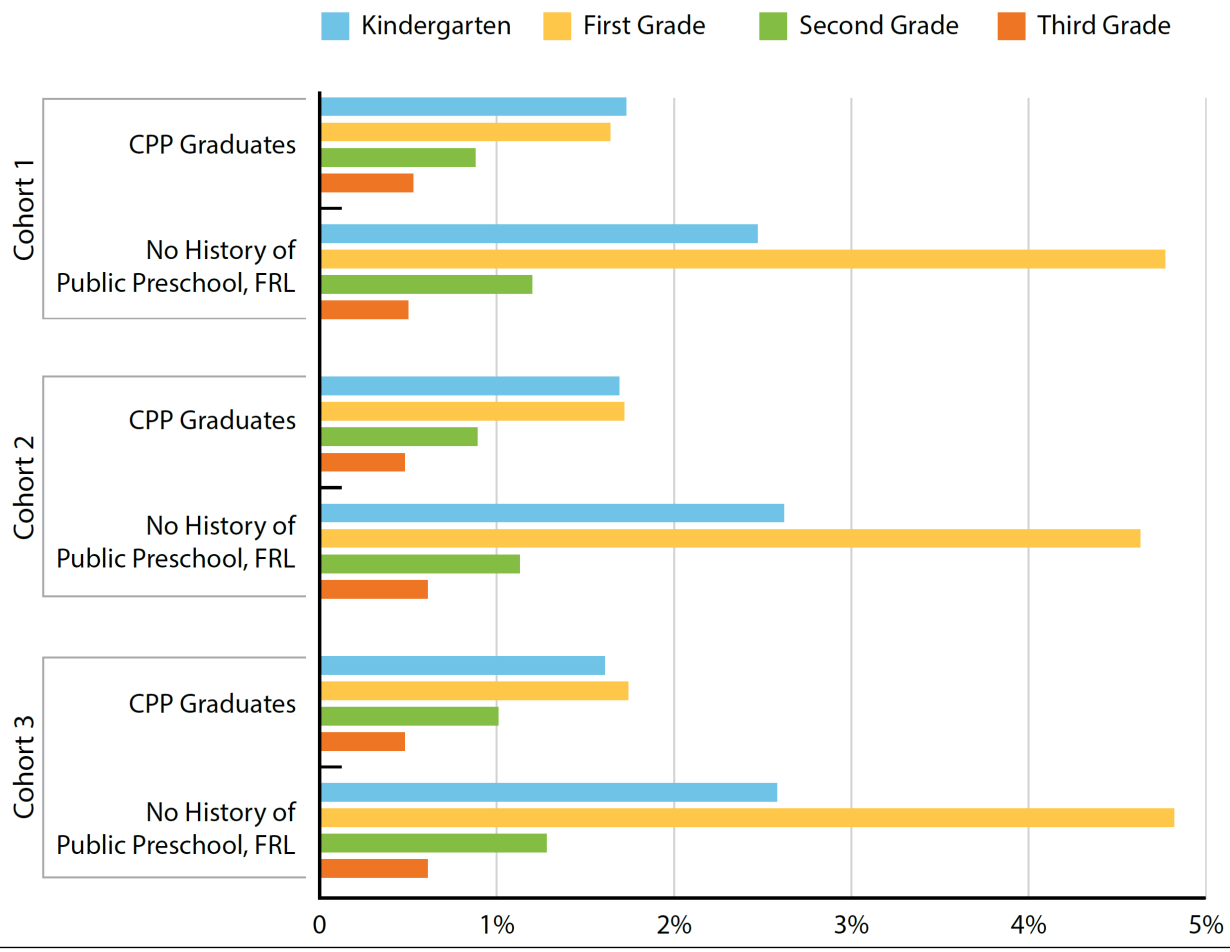


Figure 14: Cumulative Retention Rates Kindergarten through Third Grade



Source: Colorado Department of Education, Colorado Preschool Program, 2018 Legislative

Figure 15: Percentage of Students Who Were Retained, by Grade



Sustaining the Long-term Impacts of Pre-K

- Colorado is fortunate to have robust data on the long-term, positive impacts of our state-funded preschool program. That said, studies of other state PreK programs can inform program improvements in our state.
- In considering how to improve child outcomes, we know that there is compelling, high quality research on the value of preschool locally and nationally. Specifically, these studies include:
    - At the local level, the Denver Preschool Program recently released independent research findings that show third-graders who had gone through DPP outperformed those who had not on Colorado's assessment test of reading proficiency. Similar results were seen on reading assessments administered in kindergarten, first and second grades. Furthermore, English Language Learners and students living in poverty showed evidence of closing gaps to their peers.[x]
    - In the Colorado Preschool Program:
        - Across the domains of social-emotional, physical, language, cognitive, literacy, and mathematics children make significant overall gains in learning and development.[xi]
        - Significant Reading Deficiency rates (as identified under the READ Act) for CPP graduates are on average 5 percent lower compared to other at-risk children with no history of publicly funded preschool.[xii]
        - Consistently over time, CPP graduates are 33% less likely to be retained in the early grades.
        - On the state Colorado Measures of Academic Success, the percentage of CPP graduates who meet or exceed expectations in any one subject area is typically higher than those who are at-risk and with no history of publicly funded preschool. These trends are seen as far out as 11th grade and statistically significant in nearly all subject areas.[xiii]
    - A recently published analysis of the most comprehensive, high quality experimental and quasi-experimental studies of the impact of early childhood education conducted between 1960 and 2016 found that, on average, participation in ECE leads to statistically significant reductions in special education placement (-8.1 percentage points), grade retention (-8.3 percentage points), and increases in high school graduation rates (+11.4 percentage points).[xiv]
- In other states, however, studies point to the importance of thinking about (1) investing in a continuum of strategies to support early learning and that PreK is not a "silver bullet" for improving child outcomes and (2) program quality and implementation of effective, evidence-based practices is a necessary consideration to realize the promise of preschool for improving child outcomes. Quality preschool is not an "inoculation" against future educational experiences: It is unrealistic to

expect the benefits gained in any one year of schooling to be maintained in a future low-quality setting.[xv] Investments in PreK must be accompanied with supports to ensure implementation of quality, evidence-based, effective strategies locally. In addition, promoting school readiness for children entering kindergarten, but failing to ensure that K-3rd grade and subsequent educational experiences sustain those gains, will limit the long-term effectiveness of PreK. Finally, waiting to think about supporting school readiness when a child is 4 or 5-years-old misses both the developmental window when we can have the greatest impact on brain architecture (birth through 3 years-old) and when children and families have the most limited access. PreK needs to be seen as one piece of an early learning puzzle that begins, and always relies on, families and parents, and is supported with access to affordable, quality child care and schooling through 3rd grade.

- A PreK expansion strategy must also account for the impact of expanding access to public school preschool for community-based providers. Efforts to expand access to quality early care and education for three- and four-year olds must be designed to not diminish or jeopardize access for infants and toddlers. Many community-based preschool providers rely on a business model that supports enrollment of infants and toddlers by offering preschool. Any expansion of preschool must be done in a way that does not: 1) create a disincentive to offer infant and toddler care, 2) squeeze out infant and toddler capacity, or 3) undermine a business model that creates access to infant and toddler care by enrolling preschool-age children.
- A statewide system to support access to high-quality early care and education must include a "mixed-delivery" (supporting school district, charter school, and community-based options) system, to meet the needs of families, and also be combined with workforce capacity-building efforts to ensure that Colorado has an adequate number of qualified professionals who can provide developmentally appropriate learning and care for young children.

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[i] https://www.cde.state.co.us/cpp/legreports, https://www.cde.state.co.us/cpp/2018legreport
[ii] http://www.econ.ucla.edu/people/papers/Currie/Currie14.pdf
[iii] http://www.jstor.org/discover/10.2307/3083291?uid=3739568&uid=2&uid=4&uid=3739256&sid=21102655618787
[iv] http://qje.oxfordjournals.org/content/122/1/159.abstract
[v] https://heckmanequation.org/resource/invest-in-early-childhood-development-reduce-deficits-strengthen-the-economy/
[vi] http://abc.fpg.unc.edu/
[vii] http://highscope.org/Content.asp?ContentId=219
[viii] www.heckmanequation.org
[ix] http://www.readynation.org/uploads//20130916_ReadyNationVitalLinksLowResnoEndnotes.pdf
[x] http://www.dpp.org/results-and-research/main

[xi] https://www.cde.state.co.us/cpp/2018legreport
[xii] https://www.cde.state.co.us/cpp/2018legreport
[xiii] https://www.cde.state.co.us/cpp/2018legreport
[xiv] http://journals.sagepub.com/stoken/default+domain/ycdsVk2Xu4vSV8gxECVS/full
[xv] https://www.newamerica.org/education-policy/edcentral/pre-k-isnt-inoculation-what-comes-next-matters/