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CENTER FOR EDUCATION POLICY ANALYSIS, RESEARCH, AND EVALUATION (CEPARE)

The Payoff of Preschool: The Importance of Investing in Connecticut's Youngest Residents

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A child's brain reaches approximately 90% of its physical volume by age 5 and in those first five years forms over a million new neural connections every second. The level of cognitive stimulation at age 4 has been found to predict overall intelligence as well as cortical thickness (Brown & Jernigan, 2012; Narr et al, 2007). Unfortunately, children living in poverty not only hear 30 million less words than their peers but are also half as likely to be prepared for kindergarten (Hart & Risley, 2003). The experiences and stresses that occur in a child's first five years not only influence brain structure but also a child's ability to build relationships and acquire knowledge (The Impact of Early Adversity on Children's Development, 2015).

Preschool can help ensure that children reach their fullest potential. **Research suggests that preschool has a strong, positive impact on children's brain development, relationships, and knowledge acquisition, as well as a broader return on investment for society.** This brief summarizes this research and investigates preschool access in Connecticut. Specifically, I analyze preschool exposure in the Connecticut's Alliance districts, the 33 districts with the lowest Accountability index measures, compared to non-Alliance districts. I find a large gap in the percentage of children in Alliance districts who have attended preschool compared to their counterparts in non-Alliance districts. **Over the past four years, an average of 71.1% of children entering kindergarten in Alliance districts have attended preschool, while, on average, 87.25 % of children entering kindergarten in non-Alliance districts have had access to this valuable experience.** I describe

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academic and social emotional short-term and long-term impacts and summarize research describing potential benefits to specific populations and society at large. I then highlight work that identifies potential returns on investment for each dollar spent on preschool. Finally, I close by providing recommendations to the State regarding expanding access to pre-k[1], especially in districts serving large percentages of children of color and children from low-income households.

Who Attends Pre-School in Connecticut?

Overall, children in wealthier towns are more likely to attend preschool in Connecticut. Although only 24% of the total population of 3 and 4 year olds in Connecticut was enrolled in a state funded preschool in 2016 (Barnett et al, 2018), across the past four years an average of 87.3% of students entering kindergarten in non-Alliance, non-charter schools in Connecticut attended preschool. Meanwhile, an average of only 71.1% of students entering kindergarten in Alliance districts had preschool experience (see Table 1 below). While at first glance these percentages appear high, it is important to recognize that there is a range within these averages. It is also critical to bear in mind that these percentages are children; thousands of children entering kindergarten without preschool experience.

In this time period, the 2016-17 school year registered the lowest percentage of kindergarteners with preschool experience in Alliance districts. In that year, 17,251 students entered kindergarten across the 33 Alliance districts, and 5,672 of them had no preschool experience. However, that same year represented one of the highest recorded percentages of kindergartners with preschool experience in Non-Alliance districts over the last four years. In 2016-17, 19,416 students entered kindergarten in Non-Alliance districts and only 2,542 of them had no preschool experience. When this difference breaks down to students and to classrooms, the implications are powerful. Students without preschool are likely to come to kindergarten lacking foundational skills such as sitting for a story, standing in a line, raising one's hand, and using materials safely and appropriately. In comparison, students who attended preschool are likely to already know some letters and numbers, be able to write their names, and feel more confident in a classroom environment.

In many non-Alliance districts, between 90-100% of students enter kindergarten with preschool experience while in some Alliance districts (i.e. East Hartford, Bridgeport, Vernon, East Windsor) barely over 50% of incoming kindergartners attended preschool. Given the short- and long-term impacts of preschool, discussed in detail below, this difference of over 16 percentage points between students in Alliance and Non-Alliance districts has significant ramifications for school readiness skills and behavior in Alliance Districts.

Table 1: Weighted percent of kindergartners with preschool experience

	2015-2016	2016-2017	2017-2018	2018-2019
State	79.7%	77%	80.2%	79.1%
Non-Alliance[2]	87.5%	87.1%	86.4%	88.1%
Alliance	71.9%	67.1%	74.4%	71%

1 I use "pre-k" and "preschool" interchangeably in this brief.

2 These data exclude charter schools due to low enrollment

The Impact of Preschool on Children's Educational and Social Outcomes

The extent of the impact of preschool depends on the quality of the program, but in general preschool has been shown to produce both short- and long-term benefits for the individual student, his or her family, and the broader community. In the short term, students who attend pre-K tend to demonstrate greater school readiness and academic growth over time, and also enjoy long-term benefits such as enhanced academic achievement beyond kindergarten as well as social-emotional skills and educational attainment (Campbell, 2014). The family or guardian of a child who attends preschool is more likely to be employed, further their own education, and be in good health (Ramey, 2018). Importantly, preschool also exerts a positive impact on the larger community via societal contributions such as intergenerational graduation rates and wellness, reduced criminal justice costs, and higher earnings and economic stability (Moffitt et al, 2001; Garcia et al, 2016; Ramey, 2018). Children with higher vocabulary, literacy, math, and executive functioning skills, all of which are cultivated in pre-k, have greater success through early elementary and middle school. Thus, without preschool, students are more likely to struggle or remain at or below average throughout elementary and even middle school (Weiland & Yoshika, 2008).

Short-Term Impacts of Preschool

Short-term or immediate impacts of preschool are evident as students enter kindergarten and early elementary grades (through third grade). The discrepancies between students who have had preschool experience and those who have not are both academic and social emotional. **Short-term academic impacts include greater school readiness skills in the areas of language, literacy, and mathematics while short-term social emotional and behavioral impacts are evident in more positive relationships, self-regulation, and lower frequency of negative behaviors.** A meta-analysis over the past twenty five years determined that in general, preschool produces an immediate effect of half a standard deviation on cognitive development and school readiness. This means in the short-term alone, attending preschool has the potential to reduce the school readiness gap by half, or, at the individual level, to boost a student from achieving in the 30th percentile to the 50th percentile (Barnett et al, 2008). Below I describe the short-term academic and social emotional impacts in greater detail.

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Academic impact.

Academic impacts are those that are generally tested via benchmark assessments or standardized evaluations, and include pre-literacy and early reading skills, letter identification, counting, math skills, problem solving, and oral language. These skills enable students to meet the demands of kindergarten, which now is more academic than in the past, and prepare them for learning in the early elementary years. **Multiple studies indicate that students who attend preschool gain an average of a ⅓ to ½ a year of language, reading, and math skills before entering kindergarten, and in the short term, these impacts are generally present through third grade** (Ansari et al, 2017; Campbell et al, 2014; Hill et al, 2015).

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Additional research using causal designs allows researchers to isolate the causal impact of attending preschool. Recent studies have used a Regression Discontinuity Design (RDD) to simulate a randomized trial via pairing children with similar birthdays and either enrollment or non enrollment. This design allows for causal inferences, that is, that effects can be isolated as a direct consequence of having attended preschool. For example, Gormley et al (2008) found that attending a state-funded preschool produced effect sizes greater than other preschool programs in the state of Oklahoma and larger than Head Start across the nation. They found a significant impact of preschool on letter identification (effect size of .985), spelling (effect size of .743), and problem solving (effect size of .355). To further describe the impact of preschool, Gormley et al (2008) also used the Woodcock Johnson to quantify the boost preschool gave children, measured in months. They determined that public preschool boosted students' pre-reading skills by 9 months, pre-writing by 8 months, and math by 5 months when compared to non-attending peers.

Other studies have shown that students entering kindergarten with preschool experience scored significantly higher, in some cases demonstrating more than a year's worth of growth, on Letter-Word identification, problem solving, literacy and executive functioning assessments and were less likely to be retained in kindergarten than their peers with no preschool experience. These benefits last at least through first grade (Applied Survey Research, 2013; Huang et al, 2011; Pesiner-Feinberg et al., 2014; Yoshikawa et al., 2013). These short-term academic benefits are particularly pertinent for at-risk populations (low-income, children of color, language learners, special needs, etc) that tend to stay behind if they start or fall behind, and stand to benefit the most from publicly accessible preschool (Ansari et al, 2017).

Social and behavioral impacts.

Preschool has been found to produce social and behavioral impacts including skills such as conversing with peers and adults, social problem solving, self regulation, and ability to follow directions. In addition, emotional knowledge, or the ability to identify, describe, and regulate one's emotions or those of others (empathy), predicts both current and future social competence, classroom adjustment, and academic success in early childhood – more so than the influence of gender, age, and various risk factors (e.g., poverty, maternal depression). However, these skills are harder to measure and are less frequently researched or cited as an impact of preschool. There is a small but growing body of research around social emotional learning in preschool. For example, Barnett et al (2008) found **social emotional effects of preschool averaging about 0.33 standard deviations, and in the same study noted that half a standard deviation of growth has enough impact to reduce the achievement gap by half**; thus though small, the social emotional impact is noteworthy. Other social emotional impacts include reduced discipline through first grade and reduced incidence of identification as emotionally disturbed (Figlio & Roth, 2009) as well as improved adaptive behaviors, social skills, and self regulation (Yang et al, 2009). Gormley et al (2011) also found that children who attended pre-k were less timid, more attentive, less likely to engage in attention seeking behavior. While the research around short-term social emotional gains is somewhat limited, the development of executive functioning and social competencies in preschool has been found to strongly predict school adjustment and academic achievement through the early elementary years as well as peer acceptance and self regulation into the teen years and will be discussed in greater detail later (Nakimichi, 2009).

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Long-Term Impacts of Preschool

Long-term impacts of preschool are those which extend beyond the first three years of elementary school. Several studies point to some lasting effects through middle school, particularly for boys. One of the first and certainly most well known preschool projects of the 1970s, the Carolina Abcedarian Project, was the among the first to document long-term impacts on academic achievement, economic sufficiency, societal benefits, and even adult health as a result of having received quality early childhood education and wrap-around services (Campbell et al, 2014; Garcia, Heckman, Leaf, & Prados, 2016). Furthermore, some long-term impacts, such as lower incidence of retention or of needing special education services, have direct budgetary implications for school districts.

Individual Academic.

The bulk of long-term impact research comes from three widely known preschools in the 1960s and 70s, the Abcedarian Project, Perry Preschool, and Chicago Child-Parent Centers. While researchers (i.e. Heckman, Reynolds, and Campbell) have demonstrated long-term academic impacts from these preschools, the current body of research remains small. When impacts do not converge or fade with time, studies have captured achievement differences as late as middle school (Gormley et al, 2018) and even higher high school graduation rates associated with having attended preschool (Philips et al, 2016). Research has found that students who attended preschool were 3.9% more likely than non attending peers to be promoted to 8th grade on time compared to peers who did not attend preschool. Similarly other studies have found that students who attended Head Start were 6% less likely to be retained than their non attending peers and 3% less likely to be chronically absent and in fact 6% more likely enroll in honors courses (Gormley et al, 2018; Philips et al, 2016). Most recently, Bai et al (2020) found that **achievement gains due to attending preschool increased over time, meaning that students who attended preschool continued to grow and achieve at a higher rate.**

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Specific Populations.

Preschool impacts do not appear uniformly in all demographics of students. For example some researchers have found greater and longer-lasting gains for boys (Anderson et al, 2017) while others have determined that preschool attenders are less likely to be placed in special education classes (Peisner-Feinberg et al, 2019; Ramey et al, 2000). In fact, Ramey et al (2000) reported that by age 12, only 12% of students who had attended an Abcedarian Project Preschool were identified as needing special education versus 48% of their peers in the control cohort. There are students however who truly need special education services, and Yoshikawa et al (2013) found that children with special needs who attended Tulsa's preschool program demonstrated improvements in reading and pre-writing skills comparable to those of typically developing children. This work also found that the benefits extended to other subgroups of learners, including dual language learners and children of immigrants to the same or a greater extent as their native-born English speaking peers.

A few studies have also looked at the impact of preschool on children of color. Aikens et al (2020) found that Black and Latino boys made greater than anticipated growth in math and letter word identification while attending Head Start, likely due to a variety of factors including classroom environment and positive relationships between home and school. Huang et al (2011) found that Black and Hispanic preschool attenders from low-income families were significantly less likely to repeat kindergarten and experienced gains lasting through first grade. Similarly, Ansari et al (2017) found that Latino children who had enrolled in public preschool experienced gains that lasted through third grade. Lastly, in their analysis of preschool enrollment in Connecticut, Montrosse-Moorhead et al (2019) found statistically

significant gains in reading and math for Black children from low income families but smaller gains for LatinX students and otherwise non-notable effect differences. The authors note in their discussion however that Connecticut's public preschool program may not be reaching its entire target population, less frequent attendance may have hindered LatinX student gains, and that differences in program quality may have affected these findings.

Additionally, several studies have found that preschool provides particular benefits for children from low income families of color. **Increasing low-income children of colors' access to pre-k could shrink the Black-white school readiness gap by nearly 20% and the Latino-white school readiness gap by almost 36%** (Gormley et al, 2016; Magnuson & Waldfogel, 2005). A meta analysis of 29 different studies found that low income children in particular experience significantly improved (.241 difference in means) social competence compare to their peers without preschool experience (Yang et al, 2019). Moreover, low-income children are more likely to experience neglect or abuse than higher-income children and preschool can help mitigate these risks. Reynolds et al (2004) found that children , low-income or not, in public preschool programs were half as likely to be victims of abuse or neglect as their non attending peers.

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Life-long behavioral impacts.

Research also suggests that preschool has longer term benefits. Learning self-regulation or the ability to control one's body in preschool, is associated with better coping skills in adolescence, higher SAT scores, higher levels of education, and less substance abuse as adults (Campbell et al 2016; Heckman, et al, 2010; Mischel et al., 2011; Moffitt et al., 2011). In fact Moffitt et al (2011) found that learned self control (a key preschool skill) predicted adult outcomes as well as IQ and social class. Specifically, Mischel et al (2011) found that will power or the ability to delay gratification in preschoolers predicted positive adult outcomes including but not limited to academic achievement, perceived self-worth, use of effective coping mechanisms, less drug use, greater ability to focus on tasks, reduced mental illness, and better overall health. Additional behavioral impacts are also evident in the academic achievement, employment, and overall health of preschool attenders. Followup studies of the Carolina Abcedarian Program found that **by age 21, 67% of individuals who attended preschool were either employed in a skilled position or attending higher education versus 47% of their non-preschool attending peers.** The same students were also three times more likely to be enrolled or have attended a 4-year college or university and four times more likely to graduate. Former Abcedarian students were also 20% less likely to become teen parents, experienced fewer depression symptoms, reported less usage of illegal drugs, and were overall in better health. Longitudinal studies of the Child-Parent Centers

in Chicago also found that preschool participants were 32% less likely to be arrested for a felony than their comparison cohort, and 20% less likely to be incarcerated (Anderson, 2014; Reynolds et al, 2007; Reynolds et al, 2011). One study (Farah et al, 2017) even looked at the brains of 40 year olds who had attended preschool and found statistically significant positive effects on the cortical grey volume as well as white matter volume (Campbell et al, 2001; Campbell et al 2002; Campbell et al, 2014; Ramey et al, 1979). In short, the long-term benefits of preschool are considerable.

In addition to long-term benefits for individuals attending preschoool, research from a fifty year follow up of Perry Preschool suggests that positive impacts of preschool don't end with those who attend it, but rather they extend to the next generation. In fact, over 60% of children of Perry Preschool graduates completed high school without suspension, addiction, or arrest, compared to 40% of their peers whose parents did not attend Perry Preschool. They are in general, healthier, have higher educational attainment, and live in more stable family environments than those in the control cohort (Heckman, 2019).

Costs and Returns on Investment

Given the copious research supporting the impact of preschool, it is worth noting that preschool programs are costly to run. However, numerous studies have identified a positive return on investment. The three seminal studies found **net benefits to the community ranging from $3-$17 for every dollar invested in the programs** (Masse & Barnett, 2002; Barnett, 1996; Schweinhart et al, 1993; Reynolds et al, 2002). In fact, the benefits of preschool are so high that even if middle and upper middle class students gained only a tenth of the benefits that low-income children gain, two years of preschool would still be a sound public investment (Barnett et al, 1986; Barnett et al, 2008). Another study found that **birth to five programs targeting disadvantaged children delivered a 13% annual return on investment** (Garcia et al, 2016).

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More than half of the reported returns on investment show up as higher future incomes of preschool attendees. Former Perry preschoolers made on average 25% more than their non attending peers (Heckman et al, 2010) while Abcedarian preschoolers made approximately 60% more than non attending peers (Campbell et al, 2012). Other notable returns show up as less money spent on remediation and tutors ($4 for every dollar spent) for elementary students who attended preschool as well as reduced spending in the criminal justice system (Heckman et al, 2010), approximately $3-$8 less for each dollar spent on preschool (Campbell, et al 2012; Reynolds, 2001; 2002; 2011).

Recommendations

The research is clear: preschool has a positive impact on children, their families, and society. Children in Alliance districts are less likely to enroll in pre-K and thus lose out on the considerable benefits it bestows to children and their families. The state also misses out on the long-term benefits of more children attending preschool in these districts. A clear implication of this research is to **implement universal preschool in the districts that need it most.**

The research is clear: preschool has a positive impact on children, their families, and society.

Publicly funded universal preschool for all students would lead to positive outcomes for the state of Connecticut. In the 2017-2018 school year, the index score gap between high needs students (special education, language learners, and low income) and non-high needs students was 17.5 in ELA and 21.3 in Math (Callahan, 2019). The considerable impact of preschool on students with special needs or from low income homes supports the need for universally accessible preschool in order to shrink this gap. Universal preschool would also help to alleviate the huge financial burden of childcare and preschool costs on families. Given the current state of the economy and unemployment, access to quality childcare and preschool would be a tremendous boost to wages earned. Ultimately, universal preschool would also lead to higher educational attainment and wages for its participants as well, which would help to drive Connecticut's economy in the future.

The benefits of universal preschool for the next generation are already considerable and worth investing in, but the fact that access to preschool might also influence the subsequent generation magnifies the need and justification for increased preschool funding in the state of Connecticut. Implementing universal preschool in Alliance districts is an important first step towards reducing achievement and attainment gaps and investing in Connecticut's future.

References

Aikens, N., Atkins-Burnett, S., Tarullo, L., Malone, L., Kelly, A., & Cannon, J. (2020). Preschool boys of color: Portraits of the population served by Head Start. Journal of Applied Developmental Psychology, 70, 101167.

Anderson, S., & Phillips, D. (2017). Is pre-K classroom quality associated with kindergarten and middle-school academic skills?. Developmental Psychology, 53(6), 1063.

Ansari, A., López, M., Manfra, L., Bleiker, C., Dinehart, L. H., Hartman, S. C., & Winsler, A. (2017). Differential thirdgrade outcomes associated with attending publicly funded preschool programs for lowincome Latino children. Child development, 88(5), 1743-1756.

Bai, Y., Ladd, H. F., Muschkin, C. G., & Dodge, K. A. (2020). Long-term effects of early childhood programs through eighth grade: Do the effects fade out or grow?. *Children and Youth Services Review*, 104890.

Barnett, W. S. (1986). Lives in the balance: Benefit–cost analysis of the Perry Preschool Program through age 27. In Monographs of the High/Scope Educational Research Foundation. Ypsilanti, MI: High/Scope Press.

Barnett, W. S. (1996). Lives in the balance: Age 27 benefit– cost analysis of the High/Scope Perry Preschool Program. Ypsilanti, MI: High/Scope Press

Barnett, W. S., Lamy, C., & Jung, K. (2005). *The effects of state prekindergarten programs on young children's school readiness in five states*. New Brunswick, NJ: National Institute for Early Education Research.

Barnett, W. S. (2008). Preschool education and its lasting effects: Research and policy implications. Boulder and Tempe: Education and the Public Interest Center & Education Policy Research Unit.

Barnett, W. S., Friedman-Krauss, A. H., Horowitz, M., Kasmin, R., & Squires, J. H. (2017). The state of preschool 2016: State preschool yearbook. New Brunswick, NJ: National Institute for Early Education Research.

Brown, T. T., & Jernigan, T. L. (2012). Brain development during the preschool years. *Neuropsychology review*, 22(4), 313-333.

Callahan, J. (2019). Connecticut's Academic Achievement Gap. The Office of Legislative Research

Campbell, F. A., Ramey, C. T., Pungello, E., Sparling, J., & MillerJohnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. Applied Developmental Science, 6, 42–57.

Campbell, F. A., Pungello, E. P., Burchinal, M., Kainz, K., Pan, Y., Wasik, B. H., ... & Ramey, C. T. (2012). Adult outcomes as a function of an early childhood educational program: an Abecedarian Project follow-up. Developmental psychology, 48(4), 1033.

Campbell, F. A., Conti, G., Heckman, J. J., Moon, S. H., Pito, R., Pungello, E., et al. (2014). Early childhood investments substantially boost adult health. Science, 343, 1478–1485.

Cascio, E. U., & Schanzenbach, D. W. (2013). The impacts of expanding access to high-quality preschool education (No. w19735). Cambridge, MA: National Bureau of Economic Research.

Dale, M. K. (2014). Addressing the underlying issue of poverty in child-neglect cases. *Children's Rights Litigation E-Newsletter*.

Economic Policy Institute. (2020). Child care costs in Connecticut. https://www.epi.org/child-care-costs-in-the-united-states/#/CT

Farah, M. J., Duda, J. T., Nichols, T. A., Ramey, S. L., Montague, P.R., Lohrenz, T. M., & Ramey, C. T. (2017). Early educational intervention for poor children modifies brain structure in adulthood. In Poster presentation, Society for Neuroscience (SfN) 2017, Washington, DC.

Figlio, D., & Roth, J. (2007). The behavioral consequences of pre-kindergarten participation for disadvantaged youth. In *The problems of disadvantaged youth: An economic perspective* (pp. 15-42). University of Chicago Press.

Garcıa, J. L., Heckman, J. J., Leaf, D. E., & Prados, M. J. (2017). The life-cycle benefits of an influential early childhood program. University of Chicago, Department of Economics.

Gormley, W.T., Phillips, D., & Gayer, T. (2008). Preschool programs can boost school readiness, Science, 320, 1723-24.

Gormley Jr, William T., Deborah A. Phillips, Katie Newmark, Kate Welti, and Shirley Adelstein. "Social□ emotional effects of early childhood education programs in Tulsa." *Child development* 82, no. 6 (2011): 2095-2109.

Gormley Jr, W. T., Phillips, D., & Anderson, S. (2018). The effects of Tulsa's Pre□K program on middle school student performance. *Journal of Policy Analysis and Management*, 37(1), 63-87.

Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. American Educator, 27(1), 4-9.

Heckman, J. J., Moon, S. H., Pinto, R., Savelyev, P. A., & Yavitz, A. (2010). The rate of return to the HighScope Perry Preschool Program. Journal of public Economics, 94(1-2), 114-128.

Heckman, James J., Seong Hyeok Moon, Rodrigo Pinto, Peter Savelyev, and Adam Yavitz. *A new cost-benefit and rate of return analysis for the Perry Preschool Program: A summary*. No. w16180. National Bureau of Economic Research, 2010.

Heckman, James J., and Ganesh Karapakula. *Intergenerational and intragenerational externalities of the Perry Preschool Project.* No. w25889. National Bureau of Economic Research, 2019.

Huang, F. L., Invernizzi, M. A., & Drake, E. A. (2011). The differential effects of preschool: Evidence from Virginia. Early Childhood Research Quarterly, 27(1), 33-45.

Hill, C. J., Gormley Jr, W. T., & Adelstein, S. (2015). Do the short-term effects of a high-quality preschool program persist?. Early Childhood Research Quarterly, 32, 60-79.

Magnuson, K. A., & Waldfogel, J. (2005). Early childhood care and education: Effects on ethnic and racial gaps in school readiness. The future of children, 169-196.

Masse, L. N., & Barnett, W. S. (2002). A Benefit Cost Analysis of the Abecedarian Early Childhood Intervention.

Mischel, Walter, Ozlem Ayduk, Marc G. Berman, B. J. Casey, Ian H. Gotlib, John Jonides, Ethan Kross et al. "'Willpower'over the life span: decomposing self-regulation." *Social cognitive and affective neuroscience* 6, no. 2 (2011): 252-256.

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., ... & Sears, M. R. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the national Academy of Sciences*, 108(7), 2693-2698.

Montrosse-Moorhead, B., Dougherty, S. M., La Salle, T. P., Weiner, J. M., & Dostal, H. M. (2019). The overall and differential effects of a targeted prekindergarten program: evidence from Connecticut. Early Childhood Research Quarterly, 48, 134-145.

Narr, Katherine L. et al. "Relationships Between IQ and Regional Cortical Grey Matter Thickness in Healthy Adults." *Cereb Cortex*, September 2007.

Peisner-Feinberg, E. S., Schaaf, J. M., LaForett, D. R., Hildebrandt, L.M., & Sideris, J. (2014). Effects of Georgia's Pre-K Program on children's school readiness skills: Findings from the 2012–2013 evaluation study. Chapel Hill, NC: University of North Carolina, FPG Child Development Institute.

Peisner-Feinberg, Ellen, Sabrina Zadrozny, Laura Kuhn, and Karen Van Manen. "Effects of the North Carolina Pre-Kindergarten Program: Findings through Pre-K of a Small-Scale RCT Study. 2017-2018 Statewide Evaluation." *FPG Child Development Institute* (2019).

Phillips, D., Gormley, W., & Anderson, S. (2016). The effects of Tulsa's CAP Head Start program on middle-school academic outcomes and progress. Developmental Psychology, 52(8), 1247.

Ramey, C. T. (1979). The Abecedarian Approach to Social Competence: Cognitive and Linguistic Intervention for Disadvantaged Preschoolers.

Ramey, C. T. (2018). The Abecedarian approach to social, educational, and health disparities. *Clinical child and family psychology review*, 21(4), 527-544.

Ramey, C. T., Campbell, F. A., Burchinal, M., Skinner, M. L., Gardner, D. M., & Ramey, S. L. (2000). Persistent effects of early intervention on high-risk children and their mothers. Applied Developmental Science, 4, 2–14.

Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2002). Age 21 cost–benefit analysis of the Title I Chicago Child–Parent Centers. Educational Evaluation and Policy Analysis, 24, 267–303.

Reynolds, A. J., Temple, J. A., Ou, S. R., Robertson, D. L., Mersky, J. P., Topitzes, J. W., & Niles, M. D. (2007). Effects of a school-based, early childhood intervention on adult health and well-being: A 19-year follow-up of low-income families. *Archives of pediatrics & adolescent medicine*, 161(8), 730-739.

Reynolds, A. J., & Ou, S. R. (2011). Paths of effects from preschool to adult well□being: A confirmatory analysis of the child□parent center program. *Child development,* 82(2), 555-582.

Schulte, B. & Durana, A. (2016). The Care Report. *New America*.

Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). Significant benefits: The High-Scope Perry Preschool study through Age 27. Ypsilanti, MI: High/Scope Press.

Sonnier-Netto, M. E. (2018). *The Association between Early Care and Education and Midlife Outcomes: The Abecedarian 5th Decade Follow-up* (Doctoral dissertation, Virginia Tech).

The Impact of Early Adversity on Children's Development. (2015). *Harvard Center on the Developing Child.* https://46y5eh11fhgw3ve3ytpwxt9r-wpengine.netdna-ssl.com/wp-content/uploads/2015/05/inbrief-adversity-1.pdf

Weiland, C., & Yoshikawa, H. (2013). Impacts of a prekindergarten program on children's mathematics, language, literacy, executive function, and emotional skills. Child Development, 84(6), 2112-2130.

Yang, W., Datu, J. A. D., Lin, X., Lau, M. M., & Li, H. (2019). Can early childhood curriculum enhance social-emotional competence in low-income children? A meta-analysis of the educational effects. Early Education and Development, 30(1), 36-59.

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M. R., Espinosa, L. M., Gormley, W. T., ... & Zaslow, M. J. (2013). Investing in our future: The evidence base on preschool education.

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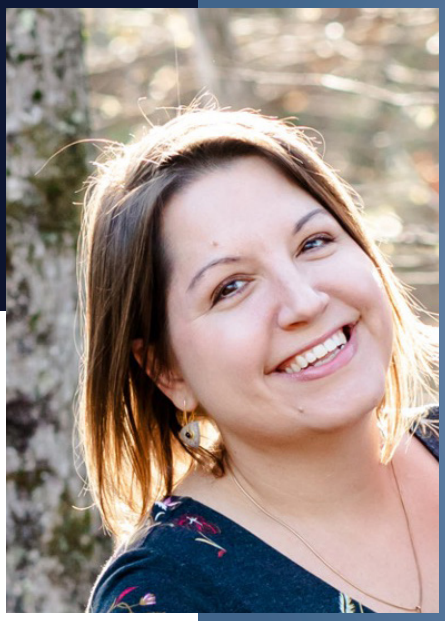
CEPARE produces high-quality research, evaluation, and policy analysis that informs leaders and policymakers on a range of pressing issues, with a particular focus on enhancing social justice and equity across p-20 educational settings in Connecticut and beyond. CEPARE produced this brief as part of the SETER Alliance, which aims to strengthen and support learning opportunities in Connecticut's Alliance districts.

Author Biography



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Daron Cyr is a doctoral candidate in the Learning, Leadership, and Education Policy program at the University of Connecticut's Neag School of Education. Her research interests include equity of access specifically in the field of parent engagement, and in the transition from preschool to kindergarten. Her doctoral work follows a BS in elementary education and an MA in curriculum and instruction, also from UConn. Prior to pursuing a PhD, Daron taught kindergarten and first grade and wrote curriculum in New Haven, CT. She is now also teaching her own kindergartener at home! For more information, contact daron.cyr@uconn.edu.