

Fighting Fadeout:
Supporting Achievement Beyond Early Childhood Education

Mariarosa Gasbarro

University of Denver

Marsico Institute for Early Learning and Literacy

Morgridge College of Education

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Executive Summary

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Early childhood education programs (ECEP) strive to provide children, especially economically disadvantaged children, with essential developmental skills for success in school. While ECEP effectively enhance participants' academic and school readiness abilities during enrollment, evidence consistently documents either complete or partial fadeout of this advantage shortly after ECEP exit.

Early childhood is well established as a critical period of human development, and early childhood education programs (ECEP) are increasingly recognized as important opportunities to positively impact child cognitive and social-emotional development, particularly for disadvantaged children. Understanding the impact of ECEP participation is essential, given the growing prevalence of state-implemented universal or targeted ECEP designed to meet the early education needs of resident children. Research supports the positive influence of ECEP participation for all children, and recognizes that ECEP effects are significantly larger for children living with disadvantage. Evidence also displays a direct relationship between program investment and participant outcomes, with better-funded programs yielding larger results for ECEP participants. Despite positive findings supporting short-term positive outcomes of ECEP participation for young children, academic advantage held by children who attend ECEP is largely constrained to program enrollment and program exit, resulting in a fadeout of measured advantage shortly after entry into elementary education.

Key Findings about the Fadeout Phenomenon

Partial Fadeout

Although measured academic and school readiness advantage seemingly fades away, children who participate in ECEP are still observed to have increased rates of high school graduation and lower rates of special education placement and grade retention, when compared to socio-economic and racially similar peers who did not attend ECEP.

Fadeout Varies among Racial Groups

Despite overarching benefits related to ECEP participation, research has also identified variation in maintenance of school readiness and academic advantage by race. White, Hispanic, and Native American children tend to maintain their ECEP advantage beyond ECEP exit, while black children display higher rates of fadeout than do other racial groups

Quality Matters: Dose-Response Relationship

While all ECEP display post-program fadeout, high quality model programs (Carolina Abecedarian Project, Perry Preschool Project, and Chicago Child Parent Centers) are shown to sustain ECEP academic advantage longer into schooling than lower quality, large-scale programs (Head Start). As program investment increases, long term program outcomes improve.

Subsequent Educational Experiences Matter

The quality of educational experiences a child encounters after ECEP participation has significant impact on the academic success of ECEP participants. Former ECEP children enrolled in lower quality schools display lower overall academic competence when compared with ECEP participants in higher quality schools. Research has commonly observed that disadvantaged children are more likely to attend poor quality elementary, middle, and high schools. Ensuring all children receive high quality education

throughout schooling will support improved long term education outcomes for all students, and counter ECEP fadeout.

Fighting Fadeout: Policy and Practice Recommendations

Increase Access to and Funding for High Quality ECEP

Providing young children with high quality ECEP opportunities provides powerful support for academic achievement and positive lifetime development. Model ECEP significantly influence increased adulthood employment, decreased reliance on Welfare, and decreased delinquency; outcomes not observed from large-scale implementation of ECEP, which may be of uneven quality... Increasing funding and availability of high quality ECEP for disadvantaged children offers two-fold support in that:

- 1) high quality ECEP promote healthy development by providing children with enriching early experiences that may be otherwise compromised by societal disadvantage; and
- 2) Access to high quality ECEP provides comprehensive family support services and allays the stress of childcare costs on low income families.

State and local governments seeking to maintain the academic and developmental gains children make while participating in ECEP must establish and enforce research-based standards for high quality services.

PK-3 Alignment

Intentional alignment of developmentally appropriate education practices and curricula, from ECEP through 3rd grade, provide seamless support for progressive knowledge acquisition by ensuring that new learning content is built upon previously mastered material. When paired with high quality ECEP, alignment of curricula from pre-kindergarten through third grade serves to enhance academic ability and support longer-term positive outcomes. PK-3 alignment offers an overarching framework of providing high quality education for young children beyond ECEP participation, and therefore promotes enduring positive academic outcomes for students.

State and local governments should create an integrated system of PK-3 learning standards to guide the development of curricula and developmentally appropriate assessments.

Improve, coordinate, and systematize early childhood teacher preparation and in-service training opportunities

Teaching practices that encourage highly responsive interactions with young children show significant promise for positively influencing social-emotional and cognitive growth among young learners, and may influence longer maintenance of ECEP advantage. Expanding current understanding of the responsible mechanisms of successful teaching practices through research will help identify teaching behaviors that influence positive outcomes for children. Providing teachers with meaningful research-based professional development will help ensure that teachers have the necessary tools to continually grow their teaching skills. Additionally, establishing clear and appropriate standards for teacher preparation will help newly trained teachers enter their classrooms prepared to effectively meet the needs of diverse students.

State governments should ensure that the content and clinical experience requirements of state-approved PK-3 teacher preparation programs and publicly supported professional development are aligned with what research has identified as the most effective strategies for improving outcomes for very young children.

Support cross-disciplinary and interagency collaboration and implementation of evidence based practices.

Given the complex inter-relatedness of social factors on child academic outcomes, the issue of fadeout is not one that can be resolved singularly by early childhood educators, but requires cross-disciplinary discussion between educators, economists, policy makers, government officials, and researchers. While certain structural components of ECEP can support more positive outcomes (e.g. curriculum, class size, school quality), review of the literature shows the significant influence of social factors that fall beyond

the control of early educators. The ecology of influences on child development requires that public and private agencies work together in a coordinated and comprehensive manner to support the positive development of young children and families.

State governments should build infrastructure to facilitate interagency and interdisciplinary work to address the broad range of issues that affect the development of very young children from birth through age 8.

Fighting Fadeout: Literature Review

The first years of life are well established as a critical period for physical, neurological, and social-emotional development, important elements of healthy child growth, but more importantly foundational components of lifetime success¹. Although these basic elements of human development apply to the healthy growth of all children, the importance of providing enriching cognitive and social-emotional experiences is magnified for children living in disadvantaged environments²⁻⁴. Stressors associated with poverty and systematic inequality directly impact the quality of home and community environments, thereby limiting developmentally enriching opportunities, and negatively influencing outcomes for children living with disadvantage³⁻⁵.

In order to mitigate the developmental risks associated with exposure to poverty and inequity, efforts have been made to support early development through a variety of interventions, with early childhood education programs (ECEP) prevalently represented among these. ECEP have been implemented in various forms, varying with regard to: time of program entry, length of program participation, half-day versus full-day enrollment, curriculum, comprehensiveness of services, degree of parent involvement, and home-visiting or center-based care. ECEP also vary with regard to intensity and scope of implementation, with several programs identified as “model” programs due to high quality, comprehensive services, and empirically supported practices (e.g. High/Scope Perry Preschool Project, Abecedarian Project, and Chicago Child-Parent Centers), and others as large-scale programs that offer less intensive implementation (e.g. Head Start and state funded pre-school and pre-kindergarten). These programs have been frequently examined to identify participation effects on child development, and despite limitations associated with research of ECEP, investigators have consistently identified positive outcomes associated with program participation (see Table 1 in Appendix for an overview of programs and outcomes).

Generally speaking, children who participate in ECEP experience significant academic and social-emotional developmental growth during enrollment⁶⁻⁸. The magnitude of program effects are

mediated by program investment and child need, wherein programs with greater financial support consistently result in larger positive outcomes for participant children and families; and children facing the greatest degree of societal disadvantage (i.e. high poverty, low level of maternal education) benefit most from enrollment in ECEP^{9,10}. While findings show significant cross-domain developmental advantage among ECEP participants when compared to non-ECEP peers, these measured advantages are largely limited to immediate, short-term observation, and drop soon after program exit^{6,8,11-14}.

This diminishment of measured advantage is largely known as “fadeout” in the research literature; however, fadeout has recently been reconceptualized as children “not maintaining their advantage,” given that children in fact display post-ECEP academic advantage, when compared to peers of the same race and socioeconomic status (SES) who did not attend ECEP, but experience a drop in achievement shortly after entry into elementary education. In essence, children are not losing their ECEP gains, but are simply not maintaining their advantaged academic trajectory in elementary education. Instead of continuing to achieve the elevated level of academic skill observed during ECEP, participants display a decrease of previous advantage after elementary school entry. This results in equalized levels of achievement between ECEP participants and non-ECEP peers as soon as first grade entry^{12,15-17}. Despite a drop in measured academic advantage, participation in ECEP is significantly related to decreased incidence of special education placement and grade retention, and increased rate of high school completion when compared to non-ECEP participant peers^{4,6,8,11,12}. Therefore, the influence of ECEP on positive outcomes across school years suggests that children benefit from ECEP in ways that may not directly impact academic achievement, but still promote positive lifetime outcomes, nonetheless.

Method

In order to closely examine fadeout or the failure to maintain ECEP advantage, a comprehensive literature review of current ECEP research was conducted. Articles were collected through electronic databases searches (e.g. ERIC, Ebsco) for contemporary articles examining child outcomes after participation in various ECEP. Additional articles were obtained using web-based resource centers, particularly the Foundation for Child Development resource library, as well as through references of

previously retrieved articles. A thorough discussion of the research challenges that limit the generalizability of findings on the effects of ECEP participation can be found in Appendix A. Appendix B provides a summary of major research studies and their findings, as well as a description of data sources in the early childhood field.

Fadeout Findings

Fadeout and Differences in Academic Achievement

The size of outcomes of ECEP participation varies among programs, but all ECEP display similar patterns of fadeout of academic advantage^{9,10}. Fadeout rates are significantly mediated by program investment, quality, and comprehensiveness of services. Well-funded ECEP (such as the Perry Preschool Project and Carolina Abecedarian Project, see Table 1 of Appendix B for program overviews) consistently show longer maintenance of advantage when compared to larger-scale ECEP (specifically, Head Start). For example, in a meta-analysis of model programs, six nationally representative samples, and fourteen state ECEP, Gorey⁶ observed that 80% of children enrolled in model programs maintained IQ scores 13-14 points above control group peers 5-9 years after ECEP participation. Comparatively, composite analysis of model and larger-scale programs showed 69% of ECEP enrolled children had elevated IQ scores 5 years post ECEP, when compared to controls. Additionally, ECEP impact over the life span is also influenced by program quality, investment, and service provision. Model programs are shown to significantly support success throughout the school years and into adulthood on a greater scale than lower quality programs (see Table 1 of the Appendix B). Evidence consistently shows that ECEP influence child outcomes in a dose-response relationship: the more investment in the program, the greater the magnitude of outcomes for participants¹⁸.

While ECEP have proven to be successful in decreasing the achievement gap over past decades (with some experts identifying a 24% decrease in the gap because of increased quality and availability of ECEP), the well-documented disparity in academic success, predicted by socio-economic status (SES) and race or ethnicity, is still present among American children^{3,27,28}. Understanding the achievement gap and its correlates with long-term academic outcomes presents an important perspective for understanding

fadeout. When a full view of societal influences is taken into consideration, a clear relationship between poor academic outcomes and economic and social disadvantage adds context to factors that accompany fadeout. An ECEP program can only be expected to achieve outcomes as significant as the communal and societal support offered to its' participants. Because of the historical inequities present in the American educational system, one "must be sensitive to the dilemma within the US of expecting all children to meet a single standard of excellence when resources devoted to meeting this standard are inherently unequal." (p. 79)⁹.

Another potential explanation for fadeout of ECEP positive effects is offered by Duncan, Ludwig, & Magnuson²⁵. They suggest fadeout observed among HS participants may be influenced by increased implementation of high quality childcare for disadvantaged children, beyond HS, and programs that target promotion of maternal education completion in American communities. The possible influence of participation in other ECEP or community support programs speaks to the previously mentioned research challenge of comparing children in ECEP with true control group peers who receive no ECEP. Provision of supplemental supports other than HS confounds research because comparison group children are also receiving ECEP, and therefore experiencing similarly beneficial educational experiences. Non-HS community- and privately-based services preclude HS participants from displaying continued academic advantage above non-HS peers because more children are entering school prepared to learn, thereby seemingly diminishing the ECEP advantage.

Fadeout and Race

Because of the significant risks associated with poverty and child outcomes, and the disproportionate representation of underrepresented people living in poverty, understanding racial influences on child academic success contributes to understanding ECEP fadeout. Overall, black children are more likely to be enrolled in ECEP programs (49% enrollment) followed by white children (43% enrollment) and Hispanic children (23% enrollment)¹⁶. While the rates of enrollment between black and white children are fairly similar, there are significant differences in the types of ECEP in which children participate. White children tend to be enrolled in higher quality programs, whereas black and Hispanic

children are more likely to participate in lower quality ECEP (as measured by teacher qualifications, curriculum practices, class size, and teacher responsivity)¹⁶. When considering that the black/white achievement gap has been observed as early as 3 years old³, differential quality of ECEP serves to further separate the academic trajectory for disadvantaged children from the very earliest school experiences.

Other observed patterns suggest race and ethnicity mediate academic achievement after ECEP participation. Downey and colleagues²⁷ found that black children enter kindergarten with greater academic competence than Hispanic or Native American children, but not white children, and experience an achievement drop through the course of the year, resulting in equal performance with Hispanic and Native American children by year end and greater disparity with white students. Interestingly, the fadeout pattern displayed by low income black children is not replicated by other underrepresented children, with Hispanic and Native American students showing sustained advantage into elementary school, in relation to white peers^{3,27,28}. Additionally, despite exiting HS academically equal with white peers, black children later display a drop in achievement, while white children maintain their achievement gains into adolescence^{12,29}. Currie and Neidell²⁹ posit that observed racial homogeneity of ECEP attended by disadvantaged children, mostly due to neighborhood demographics, may contribute to racially distinct achievement pathways, but continued examination of race mediated child outcomes is key for better supporting underrepresented children's academic success.

Fadeout and Subsequent School Quality

Additionally, school and community affluence, which are directly related to school quality, exert significant influence over child academic outcomes^{7,9,12}. Neighborhood schools largely result in homogenous SES school composition that reflects the SES of the surrounding community^{7,9}. Furthermore, disbursement of school funding based upon local property tax inherently benefits schools in wealthier communities over schools in impoverished neighborhoods, creating unequal educational environments⁹. School SES is critical to consider given its' observed influence on child academic outcomes, with higher SES schools producing greater reading achievement test scores than less affluent schools^{7,9,12}. Schools serving disadvantaged children and former HS participants are shown to score 3/4th of a standard

deviation below more wealthy counterparts on achievement tests, and a 60% gap in average cognitive assessment scores has been observed between children in the highest SES percentile when compared with children in the lowest SES⁹.

The discrepant maintenance of academic advantage calls into question the attributes of elementary, middle, and high school experiences for disadvantaged children who participate in ECEP. While literature published in very recent years investigating subsequent school quality was not found for this review, Currie and Thomas⁷ and Lee and Loeb³⁰ offer insight into the characteristics of schooling following HS participation. Using data from the 1988 NELS dataset (see Table 2 of Appendix for description of dataset), Currie and Thomas attribute HS fadeout to attending poorer quality schools after ECEP [here school quality is measured by average test scores of students in the school and a statistical fixed effect model accounting for observed (e.g. SES) and unobserved (e.g. student commitment to school) characteristics of the school]. Analysis of academic achievement at 8th grade, in low quality schools, showed similar levels of within-school academic ability between former HS students and non-HS students (who attended private ECEP, were cared for by their mothers, or received non-maternal home-based care from the ages of 3-4)⁷. Conversely, Currie and Thomas observed that 8th grade non-HS students academically outperformed former HS students within higher quality schools, when comparing former HS students and non-HS schoolmates. SES has also displayed interesting relationships with elementary school quality and child academic achievement. Pigott and Susman Israel⁹ observe that former HS participants sustain higher achievement, relative to same school peers, when enrolled in low SES elementary schools. Alternately, former HS students display moderate achievement when compared to schoolmates in average SES schools, and low to negative achievement in high SES schools in within school comparisons⁹.

These findings show fadeout as influenced by the context of subsequent school quality and SES, and may suggest fadeout occurs as more of a “move toward the middle” for ECEP participants. Higher quality schools encourage higher performance from students, and lower quality schools decrease prior advantage to levels equal with lower achieving peers. Although within-school assessments of academic

ability show significant differences in levels of achievement between HS and non-HS schoolmates, evidence supports that enrollment in high quality subsequent schools promotes academic outcomes for former HS students. Currie and Thomas point out that although black former HS students attending high quality schools score 8 points lower, on average, than schoolmates on reading assessment measures, black former HS students at high quality schools surpass the reading achievement of an average SES child in an average quality school by an average of 3 points.

Additionally, Lee and Loeb³⁰ offer an additional examination of middle school experiences for former HS students, and similarly find significant relationships between HS participation and poor quality middle school experiences. Middle schools of former HS students were less safe, had weak academic climates, and replicated established findings correlating school SES and school achievement. Lee and Loeb note that, “American children who... need the best educational environments to lift them from poverty are actually enrolled in our nation’s lowest quality schools,” amplifying risk for disadvantaged children, and lending to a reciprocal system of inequity. The quality of later schooling is an area for further investigation, and may offer yet another explanation for fadeout among low-income ECEP students.

Not only is subsequent school quality a significant predictor of ECEP fadeout, but Magnuson, Ruhm, & Waldfogel¹⁷ identify another potential fadeout pathway in the relationship between maintaining ECEP advantage and subsequent classroom size and quality of academic instruction (where quality is quantified by the frequency and depth of reading instruction offered by teachers). Analysis of ECLS-K dataset data (see Table 2 of Appendix for description of dataset) collected during the spring of kindergarten, 1st grade and 3rd grade revealed that when ECEP participants were placed in classes with high academic instruction and small class size, they experienced fadeout of their academic advantage when compared to non-ECEP children who were able to successfully "catch-up" to ECEP participant peers. The converse was found for classrooms with low academic instruction and larger class size, wherein ECEP participants maintained greater academic advantage over non-ECEP participants who failed to "catch-up" to ECEP peers. The authors posit this effect suggests ECEP children are prepared to

learn regardless of classroom size or degree of instruction, compared to non-ECEP children who require more attentive instruction for success. Magnuson et al. also found a possible "sleeper effect" for preschool participants, in that larger effects of achievement scores were observed in the spring of third grade than the spring of first grade for ECEP participants. This observation requires more investigation, but may suggest that early education imparts skills necessary for later/more advanced academic success, and the presence of fadeout is related more to the quality of later teaching rather than ECEP program limitations.

Developmentally Appropriate Practices

Implemented curriculum practices represent one important aspect of determining quality of subsequent schooling, and also significantly impacts academic success during ECEP enrollment and beyond. Using data from the HS/Public School National Transition Demonstration dataset (see Table 2 of Appendix for a brief description); Huffman and Speer⁵ have identified significant positive relationships between attending kindergarten and 1st grade classrooms with higher levels of developmentally appropriate practice (DAP) and academic outcomes among urban children living in poverty. DAP instruction is characterized by child-directed classroom practices in which the child actively engages with his/her environment, which is deliberately constructed by the teacher in a manner that facilitates interactive, age-appropriate learning. DAP curricula value the process of learning over a specific product of learning. While none of the former HS students' classrooms practiced high levels of DAP, moderate DAP classrooms showed significant positive effects on reading ability, expressive and receptive language skill, applied mathematical concepts, and general academic competence. Additionally, black children displayed equal educational gains when compared to white peers. Conversely, developmentally inappropriate practice (DIP) classrooms were found to improve standardized test performance for reading and writing skills, but decreased child motivation for learning. Experts posit that observed achievement gains in DIP instruction are a product of highly structured, direct teaching approaches that foster rote memorization, whereas the process-oriented focus of DAP facilitates skillful application of knowledge. Another study³¹ failed to find effects for DAP on child outcomes, but attributed their lack of measurable findings to moderate quality DAP in classrooms, as well as the questionable validity of standardized

measures of development compared to unmeasured aspects of success. The distinction between process and product oriented curricula could hold significant longitudinal influence in that DAP may support long-term critical analysis and cognitive skill when compared to DIP's facilitation of rote memorization.

Successful model programs, such as Perry Preschool Project, Carolina Abecedarian Project, and the Chicago Child-Parent Centers, provide evidence supporting the implementation of high quality DAP curricula, as opposed to primarily didactic academic instruction. The observed benefits of DAP in model programs offers a strong counter to calls made by policy makers to increase academic instruction in publicly funded ECEP to sustained academic gains^{5,7,9,9,29,32}. The efficacy of DAP are further evidenced in the long-term positive outcomes of model programs that have yet to be replicated by large-scale programs. Given this evidence, a push for increased academic focus would not be supported by current evidence as a way to reduce or prevent fadeout.

PK-3 Alignment

While increased academic instruction may not prevent fadeout, continued access to high quality education beyond ECEP offers a better means for predicting and sustaining academic success. To this end, alignment of ECEP with later schooling can offer a solution to prevent fadeout and maintain children on the pathway to educational success. Educational alignment conceptualizes schooling as an intentionally seamless progression of educational curricula, wherein successive educational experiences build upon previous experiences. PK-3 alignment, as it is referred to in the literature, calls for meaningful coordination of developmentally appropriate curricula from early childhood education through 3rd grade. This alignment of curricula ensures children enter subsequent grade levels equipped with foundational knowledge necessary for further learning, therefore supporting child academic outcomes and mitigating fadeout after ECEP.³³⁻³⁷

Both the Carolina Abecedarian Project (ABC) and Chicago Child-Parent Centers (CPC) provide evidence supporting the benefits of PK-3 alignment by including follow-on services in program design and implementation. As displayed in Table 1 in the Appendix, participation in ABC or CPC significantly influenced child outcomes across school years and into adulthood. Closer examination of specific effects

of ABC follow-on services (which provided a home-school resource teacher who supported parents and children by individualizing supplementary academic enrichment materials, tutoring children, and teaching parents how to help their children) reveals that while enrollment in the infant and ECEP components of ABC yielded the largest effects for cognitive and academic advantage, participation in follow-on services augmented IQ and academic assessment scores for children who also received infant and ECEP services^{10,37}. Children who participated in all three components of ABC maintained significant academic and intellectual advantage at a 15-year-old follow-up study, and showed improved cognitive capacity even at a 21-year-old follow-up evaluation, though 21-year-old outcomes did not meet statistical significance³⁷. Similarly, participation in both ECEP and follow-on services of CPC (which also provided families with resource teachers who helped children learn by tutoring, individualized learning materials, and supporting families) produced significantly higher rates of reading and math achievement when compared to peers who experienced either ECEP or follow-on services alone³⁸. This advantage was maintained at a 15-year-old follow-up evaluation; and a 24-year-old follow-up study showed a significant relationship between participation in both ECEP and third grade follow-on services and increased school completion, increased full-time employment, and decreased delinquency^{38,44-48}.

However, further analysis of the impact of post-ECEP follow-on services alone suggests that follow-on services must be offered in concert with high quality ECEP in order to maximize the benefit of PK-3 alignment. As stand-alone services, HS transition and ABC follow-on services were not found to independently predict later outcomes^{9,10,37}; although, CPC follow-on services did significantly influence increased 8th grade reading and word analysis test scores for children who also received ECEP^{37,38}. In all programs, ECEP were shown to be the strongest predictor of later outcomes, but follow-on services were consistently associated with improved rates of high school completion. Investigation of the HS transition program (which provided follow-up services to children into 3rd grade that supported parent involvement, health and nutrition, and academic support) failed to yield significant program effects, though participation in HS follow-on did show a trend toward a smaller achievement gap between disadvantaged children and their more economically privileged peers at third grade assessment^{9,37}. The differences of

outcomes between ABC, CPC, and HS transition may be a function of program quality, as only 20% of HS transition programs were found to provide high quality services, again emphasizing the importance of program investment in ECEP as well as subsequent schooling³⁷.

Teacher Impact

Teacher education and credentials represent another important area of ECEP investigation. PPP, ABC, and CPC all used highly educated teachers to implement program curriculum components, a push similarly seen in policy makers' increasing call to establish BA degrees as a basic requirement for teachers in federally or state funded ECEP^{12,39-41}. Requiring that all ECEP teachers hold minimum BA degrees holds intuitive value, and raises expectations that BA trained teachers will be better poised to implement scientifically validated practices⁴¹. Increased education could also serve to professionalize the field and reduce turnover³⁹. However, approximately 85% of current HS teachers already hold a BA or associate degree, and state-funded PK teachers typically hold the same credentials as elementary teachers²⁹. Moreover, findings pertaining to effects of teacher training for ECEP teachers are largely inconclusive or negligible. Meta-analyses of teacher qualifications and child academic success show no clear pattern of association between teacher training and child outcomes^{39,40}. Marginally significant findings were observed for BA trained teachers predicting child math skill, and teachers with education beyond a BA displayed better quality of teaching and teacher-child interaction^{39,40}. Other observations found that teachers educated beyond an associates degree were more effective instructors; however, significant findings are limited and have yet to be reliably replicated³⁹.

Clearly, teachers hold an important role in a child's education, and the lack of substantive findings may be attributed to vast disparities between teacher training programs³⁹⁻⁴¹. However, teachers represent only one component of a larger school system; their work does not occur in a vacuum, and is therefore highly influenced by the values and support of school and community leaders. Early and colleagues³⁹ write, "we will not attain high quality standards in all classrooms using our current teaching preparation and support system" (p. 192). To this end, Mashburn and Pianta¹³ offer a different perspective for examining teacher competence in the classroom, and suggest that present literature fails to capture the

true mechanisms responsible for fostering child academic outcomes by focusing on structural components (e.g. degree) as opposed to process features (e.g. teacher-child interaction). They suggest that the quality of teacher-child interaction represents a learning pathway, and improving this relationship in turn supports child outcomes. Pianta's MyTeachingPartner intervention (MTP) offers an innovative, web-based in-service skill development model of direct teacher-mentor consultation. MTP provides teachers with access to video vignettes of positive teaching practices, and allows them to film and submit their own teaching methods to a mentor/consultant. The consultant then offers direct feedback on strengths and weaknesses of the teacher's actual practices. In a small trial study, MTP significantly increased effective and responsive teaching practices, especially for teachers in high poverty schools, and also significantly improved child gains in receptive language, gains that grew during the 2nd year of intervention. MTP offers a novel approach to teacher training, and may help explain the conflicting findings surrounding teacher impact on child outcomes. Closer investigation of process components of education may reveal a better understanding of teacher impact on child academic success.

Future Directions and Policy Recommendations

Despite the clear limitations of ECEP research and varying long-term outcomes, positive lifetime benefits resulting from high quality programs display the potential of well supported programs to mitigate developmental risks faced by disadvantaged children. With growing parent work force participation and an increased emphasis on employment in Welfare regulations, the need to provide disadvantaged children with high quality child care and ECEP is more important than ever. Working parents' alternative to costly, high quality care is low-quality ECEP, a compromise for the developmental wellbeing of children. Consistent support for whole child approaches in ECEP highlight the early years as foundational for future growth, and suggest that future academic growth is best bolstered by facilitating early education that meets all developmental needs of children⁴². All ECEP are vulnerable to fadeout. Expecting significant lifetime impacts from a limited intervention is unrealistic; however, ECEP participation still provides varying degrees of protection against environmental and societal risk on the long-term, and can provide a foundation for successive academic and personal success.

The question still remains as to what can be done to better support, augment, and sustain the academic and developmental advantage held upon ECEP exit.

Recommendation 1: Increase access to and funding for high quality ECEP for low income children.

As explored in these pages, ECEP holds greatest influence for children facing the greatest disadvantage; a relationship indicating the efficacy of ECEP programs in attending to needs of the whole child by providing developmental support otherwise compromised by social disadvantage. This relationship also conveys the remarkable challenges faced by families living in poverty, and forces consideration of the potential of offering families substantive financial support, for example, in the form of additional tax credits. Publicly funded high quality ECEP offers another mean of financial support to struggling families. Targeted ECEP implementation for low-income families would offset increasingly prohibitive costs of quality care for working families, while simultaneously providing young children with a strong developmental bedrock for future lifetime achievement.

Model programs offering high-quality center based care and salient parent-visiting or parent-engagement components hold great potential for low-income children and families, and amply justify monetary investment by supporting long-term achievement for children living in disadvantage (see Table 3 of Appendix B for review of ECEP cost-benefit analyses). Outcomes from participation in model programs surpass effects found in large-scale ECEP, and support providing low-income families with comprehensive services in order to encourage long-term benefits from ECEP participation.

State and local governments seeking to maintain the academic and developmental gains children make while participating in ECEP must provide funding to establish and enforce research-based standards for high quality services.

Recommendation 2: PK-3 Alignment:

Coordinating curriculum and developmentally appropriate teaching practices from early childhood education through 3rd grade ensures that children enter subsequent grade levels ready to learn, increases child academic readiness, and, when paired with high quality ECEP, provides lasting academic

and lifetime benefits to students. PK-3 alignment offers a strong buffer against ECEP fadeout by continuing to support academic development for children, especially children living with disadvantage, by promoting the implementation of sequential and effective learning environments.

State and local governments should create an integrated system of PK-3 learning standards to guide the development of curricula and developmentally appropriate assessments.

Recommendation 4: Improve, coordinate, and systematize early childhood teacher preparation and in-service training opportunities

Teaching practices that encourage highly responsive interactions with young children show significant promise for positively influencing social-emotional and cognitive growth among young learners, and may influence longer maintenance of ECEP advantage. Expanding current understanding of the responsible mechanisms of successful teaching practices through research will help identify teaching behaviors that influence positive outcomes for children. Furthermore, providing teachers with meaningful practice-based professional development will help ensure that teachers have the necessary tools to continually grow their teaching skills. Additionally, establishing clear and appropriate standards for teacher preparation will help newly trained teachers enter their classrooms prepared to effectively meet the needs of diverse students.

Significant disparities between teacher training programs and inconsistent standards regarding teacher credentialing between preparation programs and states contribute to the lack of inconclusive findings of teacher impact on child outcomes. This variability prompts a call for establishing teacher qualification standards that ensure teachers hold a basal understanding of child development and are able to effectively implement early childhood pedagogies in practice. Additionally, evolving understanding of the driving mechanisms responsible for teacher impact on child outcomes may reorganize working knowledge of educational processes and yield more meaningful and effective teacher preparation and in-service trainings that promote responsive teaching strategies. Teaching practices that encourage highly responsive interactions with young children show significant promise for positively influencing social-emotional and cognitive growth among young learners, and may influence longer maintenance of ECEP

advantage. Expanding current understanding of the responsible mechanisms of successful teaching practices through research will help identify teaching behaviors that influence positive outcomes for children. Furthermore, providing teachers with meaningful practice-based professional development will help ensure that teachers have the necessary tools to continually grow their teaching skills. Additionally, establishing clear and appropriate standards for teacher preparation will help newly trained teachers enter their classrooms prepared to effectively meet the needs of diverse students.

State governments should ensure that the content of and clinical experience requirements of state approved PK-3 teacher preparation programs are aligned with what research has identified as the most effective strategies for improving outcomes for very young children.

Recommendation 5: Support cross-disciplinary and interagency collaboration and implementation of evidence based practices.

Given the complex inter-relatedness of social factors on child academic outcomes, the issue of fadeout is not one that can be resolved singularly by early childhood educators, but requires cross-disciplinary discussion between educators, economists, policy makers, government officials, and researchers. While certain structural components of ECEP can support more positive outcomes (e.g. curriculum, class size, school quality), review of the literature shows the significant influence of social factors that fall beyond the control of early educators. The ecology of influences on child development requires we, “know not only how education interventions can contribute in relation to other policy strategies – for example housing, health, income policy, and family-based intervention – but also whether there must be a ‘comprehensive package’ of strategies, at least within the United States, which does not have strong family support policies and universal health insurance” (p. 43)²¹. Multidisciplinary collaboration can help merge family services for disadvantaged families, thus providing low-income children with a streamlined, comprehensive support system to promote developmental success. Furthermore, bridging the historical disconnect between research and practice through active implementation of evidence-based practices will also support healthy development for disadvantaged

children. Based on wide body of ECEP literature, the evidence continually shows that you get what you pay for: the more money invested in education, the more promising the outcomes for students. Though the need for continued research is clear, educators and policy makers have access to tools shown to support long-term positive outcomes for children, particularly children at-risk of developmental dysfunction; implementing use of these tools may constitute a great challenge, but ultimately results in an invaluable endeavor.

State governments should build infrastructure to facilitate interagency and interdisciplinary work to address the broad range of issues that affect the development of very young children from birth through age 8.

Appendix A

Research Limitations

A large body of literature has evolved examining effects of participation in a variety of available ECEP in order to better understand the contributing factors and underlying pathways of this phenomenon. Despite an overarching consensus that ECEP participation provides children significant short-term advantage, and varying medium- and longer-term developmental advantage, these findings are limited due to among a litany of issues that plague ECEP research. A chief limitation to conducting quality ECEP research lies in the ethical and methodological challenges of conducting randomized control trials (RCT) of ECEP intervention, which, in turn, limits the generalizability of findings, or the degree to which findings can be applied to the population at large^{11,19-22}. Because the primary focus of ECEP research centers upon the impact of program participation for disadvantaged children, selecting experimental and control groups poses a delicate ethical consideration: one cannot prevent equally needy children from receiving potentially supportive services. This dilemma has been somewhat countered in Head Start (HS) research by examination of HS and non-HS participant siblings²³, and also in recent HS research that creates experimental and control groups based on available enrollment space and wait-listed children²⁴. While these methodologies permit an ethical division of comparison groups, they still fail to ensure true research validity. The sibling study data is vulnerable to carry-over effects of sibling participation in HS; and HS RCT researchers found control group children (i.e. wait-list children) enrolled in other HS programs or comparable ECEP, while participants assigned to HS often left their placement. These flaws result in an inaccurate assessment of Head Start effects,

and in the case of the RCT, offer valid insight only with regard to having the opportunity to participate in Head Start, as opposed to actual effects of program participation²⁴.

Appendix B

Table 1

Program	Research Design	Program Features	Selected Program Outcomes
Carolina Abecedarian Project (ABC) 1971	<ul style="list-style-type: none"> • RCT • 111 sample size • Longitudinal follow-up to 21 years old 	<ul style="list-style-type: none"> • Entry: 6 weeks – 3 months; Exit: 5 years – 9 years • Full day, full year • 1:3 infant ratio; 1:6 ECEP ratio • BA and above educated teachers and assistants 	<p><u>Decreased:</u></p> <ul style="list-style-type: none"> • Special education placement • Grade retention <p><u>Increased:</u></p> <ul style="list-style-type: none"> • School completion • General academic skill and test achievement • IQ at 15 years old • Years of schooling, including college, at 21 years old • Delayed child birth <small>6, 8, 9, 24</small>
Chapel Hill, NC	<ul style="list-style-type: none"> • Predominately black children 	<ul style="list-style-type: none"> • Home-school resource teacher/community liaison • Child-centered “learning games” curriculum • Emphasis on language development as well as whole child • Follow-on services into elementary school 	<ul style="list-style-type: none"> • IQ at 15 years old • Years of schooling, including college, at 21 years old • Delayed child birth <small>6, 8, 9, 24</small>
High/Scope Perry Preschool Project (PPP) 1962	<ul style="list-style-type: none"> • RCT • 123 sample size • Longitudinal follow-up to 40 years old • Predominately black children 	<ul style="list-style-type: none"> • Entry: 3 – 4 years; Exit: 5 years old • Half day, school year • 1:6 ratio • MA educated teachers • Weekly home-visit • Child centered High/Scope Curriculum. Emphasizes child’s active learning through central principle: “Plan, Do, Review”. 	<p><u>Decreased:</u></p> <ul style="list-style-type: none"> • Special education placement • Grade retention • Delinquency at 21 years old & sentencing and imprisonment at 40 years old. • Out-of-wedlock childbirth <p><u>Increased:</u></p> <ul style="list-style-type: none"> • IQ until 7 years old • Achievement testing until 14 years old • General academic success • School completion • Employment & earnings at both 27 & 40 years old • Home ownership at 40 <small>6, 8, 9, 25</small>
Ypsilanti, MI			
Chicago Child Parent Center (CPC) Chicago, IL	<ul style="list-style-type: none"> • Matched sampling • 1,539 sample size • Longitudinal follow-up to 24 years old • Urban, black (93%) & Hispanic (7%) community 	<ul style="list-style-type: none"> • Entry: 3 – 4 years; Exit: 9 years • Half-day preschool & half or full-day kindergarten, follow-on through 3rd grade; school year only • 2:17 preschool ratio; 25:2 kindergarten & elementary school ratio • BA and beyond educated lead teacher and coordinating teachers • Parent-resource/family-support teacher • Parent participation commitment • Whole child approach 	<p><u>Decreased:</u></p> <ul style="list-style-type: none"> • Special education placement • Grade retention • Teen age pregnancy • Delinquency at 18 years old & incarceration and conviction at 24 years old • Depression at 24 years old <p><u>Increased:</u></p> <ul style="list-style-type: none"> • Elementary school success • School entry literacy • School completion, 24 years old • College enrollment, 24 years old • Full-time employment, 24 years old <small>2, 7, 26</small>
Head Start (HS)	<ul style="list-style-type: none"> • Many studies, most with poor controls • Data analysis. 	<ul style="list-style-type: none"> • Entry: 3 – 4 years; Exit: 5 years • Half- and full-day preschool • Ratio varies by program • Most teachers hold associate or bachelor degree, varies by program, no established requirement 	<p><u>Decreased:</u></p> <ul style="list-style-type: none"> • Special education placement • Grade retention <p><u>Increased:</u></p> <ul style="list-style-type: none"> • School completion • Literacy skill at school entry
National	<ul style="list-style-type: none"> • RCT • - 4,667 sample 		

	size	• Whole child approach: health and nutrition, social services, & parent involvement	7, 9, 16-18, 22, 27, 28
	- Follow-up to 5 th grade (only NTDS participants, see Table 2, below)	• Less investment and lower quality than model programs	
State Preschool (PS) and Pre-Kindergarten (PK)	• Many regional studies, conducted with variable validity	• Entry: 3 – 4 years; Exit: 5 years • Half- and full-day programs • Ratio varies by program • Teacher more likely to hold BA, especially in PK classrooms, than HS teachers	<u>Decreased:</u> • Grade retention • Small reduction in special education placement
	• Data analysis	• Programs highly variable by state, but PK generally higher quality than HS; PS equal quality as HS	<u>Increased:</u> • Cognitive and academic skill upon school entry • School completion
National			4, 28, 29

Table 2

Database	Sample Number	Years Followed	Child Assessments
ECLS-K – Early Childhood Longitudinal Study, Kindergarten class of 1998-99	21, 260	K entry (Fall ‘98) – 8 th grade (Spring 2007)	Reading and math measures based on Peabody achievement tests and Woodcock-Johnson Psycho-Educational Battery-revised; parent & teacher interview
NLSY – National Longitudinal Study of Youth, 1979	3,984- ‘79 cohort 7,538- children of ‘79 cohort	1979-2004 Intergenerational study. 14-22 year-old females first interviewed in 1979; child interviews began in 1986	Peabody Picture Vocabulary Test, PIAT math and reading; HOME inventory; child-adolescent social, emotional, physical assessment; mother specific interviews
NTDS – National Head Start/Public School Early Childhood Transition Demonstration Study, 1991-1999	10, 829	K entry (Fall ‘92) – 3 rd grade (Spring 1997)	Peabody Picture Vocabulary Test, Woodcock-Johnson reading and math assessments; parent & teacher interview; classroom observation; child school record
NELS – National Educational Longitudinal Study, 1988	26,435	1988- Eighth graders first interviewed Four follow-up studies: 1990, 1992, 1994, and 2000	Student report questionnaire (reported on school, work, parent, peer, and community influence on school, drug and alcohol use). Parent and teacher report questionnaire. Standardized test scores.

19, 23

Table 3: ECEP Cost Benefit Analysis

Program	Initial Cost	Total Benefits*	Cost-Benefit Ratio
Carolina Abecedarian Project	\$ 70,697	\$ 176,284	2.5**
High/Scope Perry Preschool Project	\$ 17,599	\$ 284,086	16.1**
Chicago Child-Parent Centers	\$ 8,224	\$ 83,511	10.1**
Head Start	\$7,326 [♦]	***	***
State Preschool	\$6,300 [∞]	Δ	Δ

* Where available, “Total Benefits” figures include analysis of estimated costs of: child care, maternal earnings, K-12 education cost savings, post-secondary cost savings, crime cost savings, welfare cost savings, health cost savings, and participant earnings.¹⁸

** 3% Discounted Rate¹⁸

♦ National average investment¹⁸.

*** Actual figures estimating total benefits and cost-benefit ratio not available; however, experts suggest that short-term academic advantage only 25% as large as model program outcomes will pass cost-benefit ratio and yield “lifetime benefits that are large in relation to program cost.” (p. 16)¹⁸

[∞] Estimated cost of universally implemented, pre-kindergarten program.⁴³

^Δ Due to significant variation of state investment in preschool/pre-kindergarten programs, Lynch bases estimates of total benefits on CPC cost-benefit analysis, yielding conservative cost-benefit ratios ranging between 1.50-2.51.⁴³

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