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Poverty and Learning in Academic Early Childhood: A Systematic Review of the Empirical Literature

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ABSTRACT

Children living in poverty frequently enter kindergarten lacking critical cognitive, academic, and social-emotional skills, and this gap predictably widens throughout K-12. Several researchers have developed intervention programs intended to close the academic gap by building foundational curricular skills. These interventions may not be the most efficacious methods to address student needs. Given recent efforts to establish early childhood education standards and the implicit push to close the school readiness and achievement gap, it is important to identify research-based interventions for practitioners and decision-makers. The purpose of this systematic review of empirical literature, reduced from 97 to 3 articles, was to identify research related to specific pedagogical and instructional approaches used to impact poverty's effects on elementary children's academic performance.

Keywords: poverty, learning, academic achievement, early childhood, elementary

INTRODUCTION

Over 50 million students currently attend public preK-12 institutions in the United States. Approximately 3.7 million children will attend public kindergartens (National Center for Education Statistics, 2016). The number of children living in poverty or low-income significantly increased through the height of the 2008 recession. As of 2014, 15.5 million children under 18 live in poverty. Researchers have recently suggested families require an average of at least twice this income level to meet their income-to-needs ratio. Based on this assumption, 42% of children live in low-income families. (National Center for Children in Poverty, 2016). More than 10 million children who live below the poverty threshold attend public preK-12 schools, and over 1 million of these children attend public prekindergarten and kindergarten. Many more children can be said to be living in low-income families. It is not hyperbolic to postulate poverty poses the single greatest threat to children's well being, especially if they experience poverty in early childhood. Poverty can negatively impact children's ability to learn, social and emotional development, and physical and emotional health (National Center for Children in Poverty, 2016).

PURPOSE

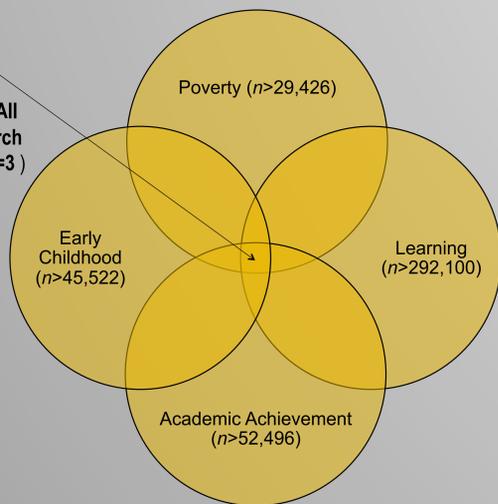
The purpose of this systematic review of empirical literature was to identify research related to specific pedagogical and instructional approaches used to address poverty's impact on elementary children's academic performance. It is essential for policymakers, educational leaders, and early childhood practitioners to be informed about potential high quality, proven research-based strategies to achieve educational equity with their peers.

Problem: There is currently very little empirical research linking the effects of poverty on the brains of young children with effective intervention/instructional strategies to mitigate the effects of poverty on school readiness and learning for children living in poverty.

Two explicit research questions guided this review of empirical literature.

1. What existing evidence based practices impact academic performance for early childhood children (ages four to six) of poverty?
2. Given empirical evidence, how can researchers assess the impact of poverty on school readiness?

At Nexus of Empirical Articles Combining All Four Research Domains (n=3)



LITERATURE REVIEW

There is clear evidence suggesting impact of poverty on student language and pre-academic skills. However little is known regarding other school readiness skill gaps. **Researchers have recently begun to explore the role of executive function (EF) on young children's readiness for school, especially in poverty (Blair, 2016).**

- **Self-regulation** related skills are broad and include self-control, emotional regulation, executive function, problem solving, and grit.
- **Executive function** can be defined as domain-specific mental skills that allow for task completion including response inhibition, attention control, attention shifting or cognitive flexibility, and working memory.
- Management of self-regulation and executive function occurs in the prefrontal cortex of the brain and affect judgment, differentiation, anticipating outcomes, time management, the ability to pay attention and switch focus, the ability to plan and organize, remembering details, and social-emotional aptitude.
- **Researchers believe early childhood is a critical development period for executive function skills and that these skills are critical for school readiness (Blair, 2016; Blair & Raver, 2015; Fitzpatrick, McKinnon, Blair, & Willoughby, 2014).**
- Very little empirical research to date exposes educational interventions addressing the effects of poverty on young children's executive function and school readiness, despite the knowledge that lack of school readiness and poor academic achievement in kindergarten often correlates with a lack of academic success throughout the remainder of K-12 education.



- The current UNICEF definition of school readiness is the "product of the interaction between the child and the range of environmental and cultural experiences that maximize the development outcomes for children" (Britto, 2012, p. 6).
- Leading researchers are increasingly determining **poverty's impacts on the development of executive function (Blair & Raver, 2015; Fitzpatrick et al., 2014)**, but the school readiness and achievement gap can be reduced by using **high-quality, research-based pedagogy and curriculum** in conjunction with creating a nurturing, supportive environment that **reduces stress on the developing brain (Shonkoff, 2011)**.
- The evidence from the existing neurocognitive research also suggests a **predictive relationship between executive function and self-regulation to literacy and numeracy skill development (Shonkoff, 2011).**

METHODS

Databases/Sources Searched

- Electronic Resource Information Center (ERIC)
- EdSource
- PsycInfo
- Science Direct
- Social Sciences Database
- PsycARTICLES
- What Works Clearinghouse
- www.USA.gov
- National Institute of Health
- National Science Foundation

Poverty	Learning	Early Childhood
<ul style="list-style-type: none">• Poverty• Poverty-study• Poverty-teaching• Economically disadvantaged• Low socioeconomic status• Income-to-needs ratio	<ul style="list-style-type: none">• Learning• Academic achievement• School learning• School readiness• Child learning• Learning orientation• Academic challenge• Executive function• Self-regulation	<ul style="list-style-type: none">• Elementary education• Kindergarten• Early childhood education• Preschool education• Early childhood program• Preschool age (2-5 years)• School age (6-12 years)• Preschool• First grade

RESULTS

This literature review served two distinct purposes.

1. The first was to determine the **relevance of the study** and examine the current body of research on how the **effects of poverty on young learners** can be **assessed or measured** and the **resulting impact of poverty on learning**. The manuscripts were also scrutinized to determine if authors included data outlining specific types of **interventions empirically correlated to specific deficits or needs** children present in **academic early childhood** because of growing up in poverty. Articles were therefore reviewed that addressed meeting the school-based needs of children in poverty.
2. The second was to determine if the **existing research base is sufficient to inform instructional decision-making** at the classroom level or policy and decision-making at the higher levels of educational systems. Empirical studies of the effects of poverty and targeted instructional approaches were identified, described, and analyzed. The explicit focus was to **identify discrete needs or gaps young children present when they enter school** that make them less ready to learn than their more advantaged peers and what, if any, **instructional approaches** can help **mitigate these deficits**.

Within the search parameters in the electronic online databases and various research-funding websites, 97 were culled. The final number of articles was reduced from 97 to 3. Of these, only three articles (3.09%) were empirical studies and addressed at least one of the research questions. The remaining 96.91% either did not meet the search criteria, align with the research questions, or were position papers, interviews, descriptive studies, or other types of non-empirical investigations

Table 1: The Reduction of Found Articles from 97 to 3

Category	Number	Percent
Poverty and learning articles found in six databases	97	100%
United States education	93	95.88%
Academic early childhood (ages 4-6)	72	74.22%
Directly addressing the research questions	66	68.04%
Empirical study	3	3.097%
Executive function	2	2.06%
Parenting and school readiness	1	1.03%

Table 2: Exclusion Criteria for Systematic Literature Review

Reason for Exclusion	Number of Articles Excluded	Percentage of the Total (N = 97)
Study Was Not Empirical		
Analysis of Extant Data Sets (e.g., the Early Childhood Longitudinal Study – Kindergarten, the Family Life Project)	33	34%
Qualitative Studies	27	28%
Longitudinal Studies	12	12%
Position Papers	2	2%
Meta-Analysis	1	1%
Interview	1	1%
Study Did Not Address Research Questions or Filters		
Study Subjects Either Younger or Older	21	22%
Did Not Address the Research Questions	6	6%
Did Not Represent United States Education	4	4%
Were Not Published Between 2006-2016	2	2%

Table 3: Characteristics of the Three Analyzed Empirical Studies

Author	Year	Sample Size	Participant Information	Gender	Age	Ethnicity	SES	Research Design	Instruments	What Works Clearinghouse Study Review		
Bierman, Nix, Greenberg, Blair, & Domitrovich	2008	356	Block Design Scale of the Wechsler Preschool and Primary Scale of Intelligence – III (average standard score of 7.98 (SD=2.88), approximately the national mean of 10)	51% F	4;0-5;11	46% M	Mean=4.49 years old (SD=.11, range=3.72-5.65)	17% Hispanic, 25% African American, 42% European American	Poverty (15% school is in high poverty by 50% school is in low poverty)	Experimental (Cluster Randomized Controlled Trial in Classroom)	• BOY/EDY assessments • Rating scales • Direct observations	• Meets SWC Group Design Standards without Reservations
Blair & Raver	2014	759	Universal Intelligence Test (UIT) (10 to 11 years)	Unknown	Unknown	Unknown	Unknown	Poverty (72% Low Income)	Experimental (Cluster Randomized Controlled Trial in Classroom)	• BOY/EDY assessments • Saliva sample collection • Teacher self-reflection forms (fidelity) • Teacher observations (fidelity)	• Meets SWC Group Design Standards without Reservations	
Brotman, Dawson-McClure, Calzada, Palamar, & Petkova	2013	1,050	Universal Intelligence Test (UIT) (10 to 11 years)	51% F	4;0-5;11	46% M	Mean=4.15 years at the beginning of study (Mean=7.4 years at the end of kindergarten)	91% Black (Study included Black and Latino students)	Poverty (72% Low Income)	Experimental (Cluster Randomized Controlled Trial in Classroom)	• Standardized kindergarten assessments • Developmental trajectories of teacher-rated academic performance from prekindergarten through kindergarten	• Meets WWC Group Design Standards without Reservations

Of the three studies (3.09%), all focused on **young children**: one of the studies focused on four-year-old prekindergarten children; one focused on prekindergarten children and the subsequent year in kindergarten; and the third study focused on kindergarten students and the subsequent year in first grade. All studies had a **mixed representation of male and female students**, and two of the three studies had a **heterogeneous grouping of ethnicities**. The other study did not specify the percentages of the African American and Latino participants who were the focus population. Each of the three studies used classifications of **“poor” or “below the poverty line” and “low income,”** but one study classified the schools involved in the cluster trial as being **“high” or “low” poverty** based on federal guidelines. The three studies used a **variety of instruments including assessments, rating scales, direct observations, interviews, and questionnaires**. Two of the studies focused specifically on investigating **executive function**, and one concentrated on the effects of an in-home parent intervention indirectly geared toward improving executive function. **The sample sizes ranged from 356 children to 1,050 children.**

SUMMARY & CONCLUSIONS

Each of these studies shares some common characteristics for implementation and application.

1. Each study article alluded to or directly states that this is a **nascent and underrepresented field of research in the literature**. The existing evidence based practices that can impact academic performance for early childhood children (ages four to six) of poverty is contained in these three studies. **This answers the first research question for this systematic review of the empirical literature.**
2. **The second question guiding this literature review sought empirical evidence on how to assess the impact of poverty on school readiness.** Recent advances and findings in neuroscience suggest poverty affects children's **EF and self-regulation development**, which in part **attributes to poverty related gaps in academic abilities and school readiness**. There are established batteries of early childhood executive function skills that can provide information to practitioners about children's readiness for school.
3. Study participants, children in **academic early childhood** in the first two and parents of prekindergarten children in the third, either predominantly or exclusively consisted of subjects living in **low income or high poverty households**. This is promising in that the main goal of this research was to identify interventions that specifically mediated the effects of poverty on how young children learn.
4. Each study focused on studying the **impact of interventions** targeted toward **increasing executive function and self-regulation in young children**, either directly or through enhanced parenting techniques, in an effort to increase school readiness and improve academic achievement. **This information can be used to find or create interventions that combine executive function, self-regulation, and social-emotional development in combination with high-quality pedagogical and instructional approaches to teaching foundational literacy and numeracy skills.**
5. Each study addressed the **persistent and pervasive school readiness and later academic achievement gap** children who live in poverty face and the implicit need to discover and test possible intervention strategies to mitigate these disadvantages.

Given the strong alignment to the research questions for this literature review and similarities of the three empirical studies, pursuing interventions that directly seek to improve EF and self-regulation behaviors and skills in young children may improve readiness for school and academic success in school.

PRACTICAL APPLICATIONS

All three studies, particularly the ones focused on classroom interventions, show promising outcomes. Data suggests a correlation between targeted EF and self-regulation interventions with low-stress, contextually appropriate classroom environments, and strategic content-based instruction to increased school readiness behaviors and academic outcomes. For generalization purposes, further research is required. Suggestions for futures studies include:

1. Replicate the study(ies) with children in different demographic settings (i.e., type of school, region of the country, socio-economic status).
2. Replicate the study(ies) with increased sample sizes.
3. Extend the study(ies) to other primary elementary grades to explore if these initial findings can be replicated.

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