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THE SUNSHINE PORTAL
Florida's Early Childhood Integrated Data System

Research Brief: An Ecological Study of Literacy Growth Among VPK Attendees

FISCAL YEAR 2024-2025

EARLY CHILDHOOD POLICY RESEARCH GROUP (ECPRG)

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Early Childhood Policy Research Group (ECPRG)

This work is the result of the Early Childhood Policy Research Group; a collaborative team housed at the University of Florida Anita Zucker Center for Excellence in Early Childhood Studies that consists of the following partnership organizations and individuals.

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Contributions that Impact Better Program and Child Outcomes

Educational researchers have long recognized that children enter formal schooling with varying levels of academic preparation, shaped by complex interactions between individual, family, and contextual factors. The question of how early childhood education programs can effectively optimize learning outcomes for all participants remains a central challenge in educational policy and practice.

Research Context and Objectives

Since 2018, the Early Childhood Policy Research Group has developed comprehensive administrative data systems to examine child and family development patterns in Florida. This study leverages the Early Childhood Integrated Data System to investigate learning outcomes among 93,584 children enrolled in Florida's Voluntary Prekindergarten Education Program (VPK) during the 2022-2023 academic year.

Guided by Bronfenbrenner's bioecological systems framework, which emphasizes the importance of multiple contextual influences on child development, this research employed machine learning methodologies to identify complex patterns of kindergarten readiness growth. The study examined how combinations of individual, household, and classroom characteristics contribute to both initial academic performance and learning trajectories during the VPK year.

Methodological Approach

This research utilized a sophisticated three-stage machine learning pipeline to analyze multivariate outcomes: initial Florida Assessment of Student Thinking (FAST scores and monthly growth rates during VPK participation. The methodology included random forest regression for variable selection, conditional inference trees for subgroup identification, and subgroup-specific analyses using Shapley values to quantify predictor relationships.

Five primary domains of predictors emerged from the analysis: maternal education level, maternal country of birth, health factors, social service utilization, and VPK attendance patterns. This comprehensive approach allowed researchers to examine not only main effects, but also complex interaction patterns that traditional analytical methods would be incapable of discovering.

Principle Findings

The Compensatory Growth Phenomenon

This study revealed a notable inverse relationship between initial academic performance and growth rates during participation in VPK. Children who entered the program with lower FAST scores demonstrated significantly higher monthly growth units (MGUs) compared to their peers who began with higher initial scores. This compensatory pattern was particularly pronounced among specific demographic subgroups.

Children whose mothers possessed elementary education levels (≤8th grade exhibited average initial FAST scores of 609.7 but achieved growth rates 17% above average (MGU = 1.17. Conversely, children of mothers with doctoral degrees demonstrated average initial scores of 689.9 but experienced growth rates 10% below average (MGU = 0.90). This 27% differential in growth rates between the lowest and highest maternal education groups represents a substantial compensatory effect.

Attendance as a Critical Moderator

Attendance patterns emerged as the most consistent predictor of positive outcomes across all demographic subgroups. Children with high attendance (>60 hours per month demonstrated superior performance compared to those with low attendance (<50 hours per month), regardless of family background characteristics.

The interaction between attendance and maternal education revealed particularly noteworthy patterns. Among children whose mothers had limited formal education, high attendance was associated with growth rates 23-36% above average. Even among higher maternal education groups, consistent attendance enhanced otherwise modest growth patterns.

Economic Factors and Program Effectiveness

Children from families receiving Supplemental Nutrition Assistance Program (SNAP) benefits typically demonstrated lower initial FAST scores but showed evidence of accelerated growth during the VPK year. This pattern was consistent across maternal education levels, suggesting that VPK programming may be particularly beneficial for children in economically challenged families when attendance is maintained.

Theoretical Implications

These findings align with educational theory regarding compensatory education effects, where targeted interventions demonstrate greatest impact among children who begin with different starting points. The results suggest that VPK programming functions as an effective mechanism for enhancing academic growth, particularly when children maintain consistent attendance.

The bioecological framework's emphasis on proximal processes—regular, progressively complex interactions between the child and immediate environment—is supported by the attendance findings.

Limitations and Methodological Considerations

While the machine learning approach allowed for the identification of complex interaction patterns, the observational nature of the data precludes causal inferences. Additionally, the study's focus on academic outcomes, as measured by FAST assessments, may not capture the full range of benefits associated with VPK early childhood education programming.

The research team notes that the Classroom Assessment Scoring System (CLASS) showed minimal associations with growth outcomes. This may be due to measurement limitations of the CLASS, a broad measure of classroom experiences, in relation to the specific childhood outcomes of FAST. Alternatively, it could indicate that other unmeasured classroom factors and individual child experiences influence learning outcomes.

Policy and Practice Implications

The research provides evidence that VPK programming can effectively enhance academic outcomes across diverse family contexts, particularly for children from families with varying educational backgrounds and economic circumstances. However, these benefits are contingent upon consistent program participation.

Programmatic Recommendations:

1. **Attendance Support Systems:** Develop comprehensive approaches to identify and address barriers to consistent VPK attendance, including transportation, scheduling, and family-support needs.
2. **Targeted Outreach:** Focus enrollment and retention efforts among families most likely to benefit from VPK programming, particularly those with limited educational backgrounds or economic resources.
3. **Professional Learning:** Focus educator training on strategies that maximize learning opportunities for children who enter with varying levels of school readiness.

Research Priorities:

1. Investigate specific mechanisms through which attendance influences learning outcomes.
2. Examine long-term effects of VPK participation patterns on elementary school performance.
3. Develop and test interventions designed to improve attendance among populations with multiple participation barriers.

Conclusions

This research demonstrates that Florida's VPK program exhibits significant potential as a compensatory educational intervention, particularly for children who enter with lower levels of academic preparation. **The consistent finding that higher attendance increases literacy growth across all demographic subgroups suggests that policy efforts should prioritize strategies that support consistent program participation.**

The substantial growth differentials observed among children from different educational backgrounds, combined with the benefit of consistent attendance, suggest that early childhood programming can serve as an effective mechanism for enhancing educational outcomes more broadly. Realizing this potential, however, requires sustained attention to factors that support consistent program engagement among families who may face multiple barriers to participation.

These findings contribute to the growing body of evidence supporting targeted, high-quality early childhood experiences as a strategy for promoting academic outcomes while providing specific guidance for program improvement and policy development.

See the Sunshine State Early Childhood Information Portal for a more detailed description of the study and findings.