

# RESEARCH REPORT



NIEER



## **The Developmental Status of Young Children in Indiana**

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## **Abstract**

The National Institute for Early Education Research (NIEER) conducted a landscape evaluation of early childhood programs in Indiana (IN) between the spring of 2021 and the summer of 2022. The evaluation included assessments of infant, toddler, and preschooler children’s developmental status in multiple domains at two time points to measure growth. Commissioned by Early Learning Indiana (ELI), with generous support from Lilly Endowment Inc., this study aims to provide Indiana programs and policymakers with research-based information on the quality of early childhood programs, as well as the learning and development status of young children birth to five in the state.

This study employed a set of standardized child assessments designed to measure learning across various domains that are psychometrically valid, proven to discriminate effects in intervention studies, and appropriate for the age range of birth to five. The study found that on average, all children showed significant growth in receptive vocabulary, regardless of their enrollment location or center type. However, literacy development lagged for all children similarly, regardless of where children were enrolled. Overall, children also showed improvements in externalizing behaviors. For infants and toddlers, we found lower developmental levels in language, cognition, and socio-emotional levels relative to what we expected due to maturation alone. At baseline, the children of preschool age in the sample had lower levels of literacy and math skills compared to their typical peers, but they had similar language and executive function skills. During the study period, the children made strong gains in vocabulary and showed expected growth in math and executive functions relative to peers their age. However, their literacy skills showed slower growth than typical, and in fact, they lost relative to their peers in standard scores.

The report discusses the policy implications of these findings on children’s developmental status and considering the findings on program quality, we recommend that the state provide all educators with the necessary tools to effectively support children’s healthy growth and development. This includes enriched, culturally responsive curriculum and instructional resources, effective assessments to measure and drive progress for classrooms and children, sustained professional development, and actionable data for continuous improvement.

## **Acknowledgments**

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## **About NIEER**

The National Institute for Early Education Research (NIEER) at the Graduate School of Education, Rutgers University, New Brunswick, NJ, conducts and disseminates independent research and analysis to inform early childhood education policy.

## About the Authors

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Dr. Li, Ph.D. is Assistant Research Professor at NIEER. Dr. Li is an experienced psychometrician and statistician. She has led and participated in leading and conducting rigorous reliability and validity research studies for multiple subjects, including Peabody Picture Vocabulary Test III and IV, the Hawaii Early Learning Profile®, and the High/Scope Child Observation Record.

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## Key Takeaways

### *Overall findings on children's developmental status:*

- All children showed significant growth in receptive vocabulary, regardless of their enrollment location or center type.
- However, literacy development lagged for all children similarly, regardless of where children were enrolled.
- Overall, children also showed improvements in externalizing behaviors.

### *Infant and toddlers:*

- At baseline, we found lower developmental levels in language, cognition, and socio-emotional levels relative to what we expected due to maturation alone.
- We also find growth across infants and toddlers higher than typical for this age group.

### *Preschoolers:*

- At baseline, the children of preschool age in the sample had lower levels of literacy and math skills compared to their typical peers, but they had similar language and executive function skills.
- During the study period, the children made strong gains in vocabulary and showed expected growth in math and executive functions relative to peers their age.
- However, their literacy skills showed slower growth than typical, and in fact, they lost relative to their peers in standard scores.

### *Policy implications:*

The research indicates that high quality early education is one of the most influential investments that state policymakers can make to support young children's learning, in addition to providing supports for families as their children's first teachers. Based on the results of this study, including the findings on program quality and children's developmental status, it is essential to provide all educators with the necessary tools for success. This includes enriched, culturally responsive curriculum and instructional resources, effective assessments to measure and drive progress for classrooms and children, sustained professional development, and actionable data for continuous improvement.

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## Introduction

The National Institute for Early Education Research (NIEER) conducted a landscape evaluation of early childhood programs in Indiana (IN) between the spring of 2021 and the summer of 2022. The evaluation focused on understanding program components, program quality, and children’s learning and development across a variety of programs in the state. Commissioned by Early Learning Indiana (ELI), this study aims to provide Indiana programs and policymakers with research-based information on the quality of early childhood programs, as well as the learning and development status of young children birth to five in the state.

This research brief, *The Developmental Status of Young Children in Indiana*, summarizes the developmental status of infants, toddlers, and preschoolers in a sample of 321 classrooms in 206 programs in Indiana across two time periods. Pre-test data was collected in the fall/winter of the 2021-22 school year, and follow-up post-tests were conducted in spring/early summer of the same school year.

The full report of the study, *Evaluation of Early Childhood Programs and Child Development in Indiana*, and an accompanying Research Brief, *Quality in Early Care and Education Programs in Indiana*,<sup>i</sup> discusses the implications of these findings for policymakers and funders in Indiana as they seek to strengthen the early care and education system in order to improve the school readiness of young children. Together, the two briefs can provide important information about the developmental status of children and classroom quality in the state to the Indiana Early Learning Advisory Committee as they implement the recommendations in the 2022 report, *A Roadmap to Modernize Indiana’s Early Learning System*.<sup>ii</sup>

## State of Young Children in Indiana

According to the National Kids Count report, Indiana ranks 29 out of the 50 states since 2019 for child well-being and 17<sup>th</sup> in overall indicators of education.<sup>iii</sup> Indiana ranks 20<sup>th</sup> in rates of child poverty, with a rate of 17.6%. This means that many children are experiencing the adverse impacts of low economic status of their families.<sup>iv</sup>

Very little is known, however, regarding young children’s developmental status or the impact of early care and education programs on child outcomes. There is some evidence that low-income four-year-old children participating in the state-funded On My Way PreK showed growth in school readiness, language, and literacy as compared to similar peers.<sup>v</sup> Most children participating in On My Way PreK maintained growth through the third and fourth grade on standardized measures of English/language arts and math. However, “only 28-48% of children in On My Way Pre-K meet target benchmarks set for higher-income children on language, literacy and math skills.”<sup>vi</sup> This means there is more work to be done to ensure equitable access to high quality early care and education programs for all children in Indiana.

The state is gearing up to strengthen its focus on the youngest learners. In 2022, the governor created the Office of Kindergarten Readiness in the Department of Education to work closely with the state’s Early Learning Advisory Committee and the early learning division of the Department of Family and Social Services. To ensure data drives state decisions, the State Board

of Education has launched a new data dashboard, or “GPS”, called Indiana Graduates Prepare to Succeed that will track indicators of early school success (e.g., early literacy and kindergarten readiness) through post-high school graduation. This study is the first step towards understanding how a broad sample of young children across the state of Indiana are progressing developmentally as compared to their peers, and how various experiences in early care and education impact their development.

## **Study Design**

We assessed multiple domains of children’s development using independent measures and teacher reports in the fall/winter of the 2021-22 school year, and again in the late spring/early summer of 2022. This research brief summarizes key findings on the developmental status of infant, toddler, and preschool children in the sampled programs in Indiana. The sample consists of 321 classrooms in 201 programs, including center-licensed, home-licensed, Local Education Agencies (LEAs), and ministry programs. Among these, 48 were home-based providers. Twenty-nine were Building Blocks programs (Building Blocks is a non-profit serving 28 counties in southern Indiana). The sample included programs across all PTQ ratings; however, more than 60% of the sample were rated 3 and 4, while about 13% were not rated. Additionally, 78% were in low-income communities, with 44% in urban areas and 35% in rural areas.

The study’s original plan was to conduct assessments of children’s developmental status at two time points to assess growth - the first assessment in the spring of 2021 and the second assessment in the fall of 2022. These timelines were revised due to constraints imposed by the COVID-19 pandemic. Child assessments were conducted twice to assess child growth over time - once between September 2021 and February 2022 and again between April 2022 and July 2022. The constraints imposed by COVID-19 and the delta and omicron variants on early childhood programs required working individually with programs to engage them in the study and to find time for observations and child assessments when the program could be visited by the research team. It is important to recognize that survey data on teachers and the socio-emotional status of children was most impacted by this.

## **Child Measures**

This study employed a set of standardized child assessments designed to measure learning across various domains and that are psychometrically valid, proven to discriminate effects in intervention studies, and appropriate for the age range of birth to five. Analyses of growth in children in these measures allows understanding of the differential experiences of children across programs in Indiana.

Infants and toddlers were assessed with the Bayley Scales of Infant and Toddler Development-Fourth Edition (Bayley-IV). This is a comprehensive assessment of five developmental domains for children ages 1 to 42 months of age. We used two scales of the Bayley — cognitive and language (expressive and receptive), as well as the socio-emotional companion surveys to teachers.



Preschool-age children were assessed in expressive vocabulary, math, literacy, executive function, and socio-emotional skills. The measures utilized were:

- The Peabody Picture Vocabulary Test--Fourth Edition (PPVT-IV), a 204-item test of receptive vocabulary in standard English.
- The Woodcock-Johnson Psycho-Educational Battery-Fourth Edition (WJ-IV), which includes two subscales: Applied Problems and Letter-Word Identification subtests, which broadly measure math and "reading."
- Dimensional Change Card Sort Task (DCCS), which assesses attention-shifting and short-term memory.
- Peg Tapping Test (PT). This test requires children to inhibit a natural tendency to mimic the experimenter while remembering the rule for the correct response.
- The Child Behavioral Checklist, a teacher-reported measure of children's social-emotional skills.<sup>vii</sup>

Preschool child assessors were trained to reliability by the NIEER team, and Bayley IV assessors were trained through Pearson's online training platforms, with reliability conducted with NIEER. NIEER Training includes training in practices and procedures for research conducted with children, as well as completing background checks and training in human subjects' research (human subject protections, ethical issues, etc.).

## Findings

Results are reported on the developmental gains of children in the programs by child age, urbanicity, program rating, and program type. In addition, estimates on the association between children's gains and various center and family variables provide insights into the factors that influence children's developmental progress.

### *Infants and toddlers*

This evaluation measured infant and toddler developmental gains in the areas of vocabulary (receptive and expressive), cognitive development, and socio-emotional development. Infant and toddler scores for the 2021-22 gains for the overall sample, and for selected subgroups of interest are reported below. Gains allow interpreting the developmental progress of the children in the sample in relation to the typical average development of children of the same age.<sup>viii</sup> Standard positive gains depict gains for children above those typical for children of the same age, and negative standard gains do not depict losses, but rather a slower progression than average relative to children their age.

*Infants and toddlers in the sample evidenced lower developmental levels at the first assessment, and despite gaining more than is typical by the second assessment, were still on average performing lower on the measures of infant-toddler development by the end of the study.* Infants and toddlers in the study scored under the norm relative to children their age at baseline on the language subscale of the Bayley. Children in higher-rated programs had slightly higher language scores at baseline, and baseline scores were highest for non-rated programs and in mid-sized communities.<sup>ix</sup> Over the study period, children in the study gained in relation to typical peers

their age, with mean standardized gains of 3 points in language. Language gains were largest in home-licensed care (which had on average lower baseline scores), PTQ rated 3 (with the lower baseline scores as well), and mid-sized communities (which started with higher child scores on average and where children grew the most in terms of language).

While gaining more than expected relative to typical peers their age, infants and toddlers in the study scored on average under the levels expected due to maturation even by 2022 in cognitive development. Children in non-rated centers and centers rated at 4 evidenced average higher baseline levels in cognitive development in relation to peers their age and in the study. Average cognitive standardized scores for children were also higher in programs in mid-sized communities and much lower in rural communities. Over the study period, children in the study gained in relation to typical peers their age, with mean standardized gains of 2.5 points in cognition. Children in rural communities started with the lowest baseline scores and grew the most on average. Similarly, children in home-licensed care evidenced the lowest baseline scores and grew as much. This is also the case for cognitive gains for children in centers with a PTQ rating of 3 or under.

Teachers also reported that infants and toddlers in the study were performing slightly under or at average levels relative to peers their age at baseline, further supporting the findings from independent measures of children’s developmental status. Between pre- and post-test, children in the sample improved slightly in terms of socio-emotional development relative to what would be expected for their age, but mostly stayed at par with peers in socialization. Scores varied slightly across quality levels with higher growth reported in children in centers rated 4 or unrated centers in socio-emotional development and in centers rated 4 in socialization. It is important to note that these scores are based on teacher reports and there was a low response rate and a high amount of variance (high standard deviations) by teachers at post-test.

*Few differences were found by type of program and other characteristics.* We also assessed the degree to which classroom and center characteristics are related to infant and toddler gains, controlling for child socio-demographic characteristics. Results showed few differences in children’s development by type of program (i.e., LEA, center-based, home, others), by urbanicity or by PTQ rating. However, the trends were not systematic across all child outcomes. Exploratory analyses suggest a negative association between “ministry” programs and children’s language gains, and a positive and significant association for programs with PTQ ratings of 3 and 4 and children’s language gains. The positive association was also present for programs with a rating of 3 in terms of cognitive gains.

### *Preschool children*

*Preschool-aged children started out at lower developmental levels and progress slower than national norms.* On average, children in the sample gained in receptive vocabulary relative to peers their age, but had less growth in literacy and math as compared to their peers. In literacy and math, children in this IN sample were performing under the norm at pre-test, and with a slower progress than typical for children of similar age. They were further behind by the spring 2022 assessment.



Developmental gains for the 2021-2022 follow-ups across selected subgroups were analyzed. Gains (or losses) should be interpreted as changes relative to peers their age.<sup>x</sup> Preschool-aged children in the sample showed average baseline scores in literacy and math above findings from the fall 2019 FACES study of Head Start.<sup>xi</sup> Preschool children started with scores above average for their age and gained in relation typical of their peers their age in vocabulary. In literacy, standard gains were negative, which implies gains below those of average peers their age. For math, gains, while slightly negative, were close to zero, which implies children gained at par with typical peers their age.

Preschool children in the IN sample were on par developmentally on measures of executive function with national peers and made expected gains due to maturation on follow-up assessments. The incidence of socio-emotional problems decreased between the pre and post-test with most improvements observed in externalizing behaviors. Teachers report the measure and there was a low response rate in the number of teacher reports (with only 32% of the sample having post-test scores). Therefore, these results should be interpreted with caution.

*Children's developmental status were not meaningfully different when analyzed by selected program characteristics.* We assessed the degree to which classroom and center characteristics are related to children's gains, controlling for child socio-demographic characteristics.<sup>xii</sup> With few exceptions, there were no systematic patterns in differences in gains across program types in literacy, math, and executive function measures. However, the trends were not similar across the different child outcomes. The associations that emerged significant (and in fact, negative) were:

- Children in LEA programs (which started with higher baseline scores), as well as rural and urban programs, scored lower on measures of receptive vocabulary. These children showed smaller growth during this period.<sup>xiii</sup>
- PTQ-rated 3 programs also evidenced lower receptive vocabulary score gains.
- Rural programs and PTQ 3- and 4-rated programs evidenced lower gains on the measure of executive function.
- Ratings on CLASS Emotional and Instructional Support in preschool classrooms were negatively related with receptive vocabulary gains, while ratings in CLASS Classroom Organization were positively associated with receptive vocabulary and literacy gains.

## **Conclusion**

*What we know from research.* Decades of research on young children's participation in high-quality early education programs indicates benefits for children's cognitive, academic, and social-emotional development. These effects are typically greater for children experiencing poverty, and numerous studies have indicated significant reductions in related adverse experiences such as placement in special education programs, dropping out of school, and on adult employment and health.<sup>xiv</sup> The critical factor in achieving these positive outcomes is the

quality and sustainability of participation in high-quality early care and education programs and early elementary school.

*What we found for Indiana's children.* Descriptions on the developmental growth of children in early childhood programs provide a landscape on the development of children in several types of ECE programs in Indiana.

*Key findings for infants and toddlers:*

- Infants and toddlers in the sample showed lower developmental levels than typically observed for children in this age group in 2021 (with the measure utilized in this study).
- However, babies and toddlers appear to be gaining relative to the norm, with positive gains in standardized scores, even if remaining under the average relative to peers their age.
- Some differences emerged by program type, with children in programs showing lower baseline scores in language and cognitions seemingly evidencing higher growth.

*Key findings for preschool children:*

- When the study commenced, the children of preschool age in the sample had lower literacy and math skills compared to typical peers (children with which the instruments were normed), but their language and executive function skills were similar.
- Over the course of the study, preschool children made on average significant gains in receptive vocabulary, exceeding the typical growth for children their age. In addition, they exhibited mostly expected growth in math and executive functions.
- However, their literacy skills showed slower growth than typical, and in fact, a decline was observed relative to their peers in standard scores. These patterns were consistent across different ratings, urban areas, and program types. The slower growth in literacy development is particularly significant since children were lagging to start with, and these trends mean a slower literacy growth is compounding over time. The math trends are not as stark, but there is some indication of a similar (albeit small) issue for some children.
- Patterns in vocabulary provide a sense of optimism, as preschool children gained substantially over the study period. These trends seem to align with other research on the COVID-19 pandemic's impact on children's learning. It could be that children in the critical early years evidence higher vulnerability to the impacts of the pandemic (as suggested by this research and other studies measuring child growth during the pandemic). Further research could help clarify these and other similar findings.

*What Indiana policymakers can do.* The research indicates that high-quality early education is one of the most influential investments that state policymakers can make to support young children's learning, in addition to providing supports for families as their children's first

teachers. The Indiana Early Learning Advisory Committee (ELAC) 2022 report to the Governor and the Legislative Council calls on the state to strengthen the early learning system to ensure young children in Indiana, especially vulnerable children, “have access to early learning opportunities capable of preparing them with the foundational skills required to thrive in kindergarten and beyond.”<sup>xv</sup>

In this context, this study aims to provide a landscape on the state of young children in Indiana to serve as a baseline for the actions of state agencies in the future. Based on the results of this study, including the findings on program quality and children’s developmental status, it is essential to provide all educators with the necessary tools for success. This includes enriched, culturally responsive curriculum and instructional resources, effective assessments to measure and drive progress for classrooms and children, sustained professional development, and actionable data for continuous improvement.

As noted, in the accompanying reports, we recommend the following:

- Enhance infant teachers' skills to support early language development and cognitive development.
- Increase toddler teachers' acumen in facilitating instruction and modeling language.
- Enhance pre-K teachers' skills in strategies to facilitate instruction, scaffolding learning, and application of knowledge to new concepts, with an emphasis on language development and content (i.e., math).
- Increase the effective use of research-based curricula.
- Increase the availability of developmentally appropriate materials in classrooms.

To ensure teachers and other staff receive sustained and tailored support for quality improvement (QI), Indiana will need to revise and align the system of quality improvement to these indicators. Further, as Indiana ELAC considers revisions to Paths to Quality, the findings suggest the following system enhancements:

- Conduct annual or bi-annual independent assessments of quality with one or more standardized measures (possibly stratified by PTQ rating).
- Build a robust data system that can collect, analyze, and use data frequently to target resources and training to programs and individual educators as needed.
- Invest in a select “few” QI interventions (e.g., curriculum, coaching) with strong research-based evidence, targeted to different sectors and program types.
- Conduct a longitudinal evaluation (spanning over four or more years) of PTQ program participants and children in order to determine how quality levels change over time and the impacts on children from infancy through early elementary.

## Endnotes

- <sup>i</sup> See <https://nieer.org/evaluation-of-early-childhood-programs-and-child-development-in-indiana-from-2021-2022>
- <sup>ii</sup> Indiana Early Learning Advisory Council (2022). A Roadmap to Modernize Indiana’s Early Learning System: 2022 Recommendations of the Early Learning Advisory Committee. <https://www.in.gov/fssa/carefinder/files/ELAC-Recommendations-2022.pdf>
- <sup>iii</sup> 2022 Indiana Kids Count Databook: Executive Summary. [https://www.iyi.org/wp-content/uploads/2022/01/IYI\\_22ExecSummary.pdf](https://www.iyi.org/wp-content/uploads/2022/01/IYI_22ExecSummary.pdf)
- <sup>iv</sup> Quinlan, C. Indiana has the 20<sup>th</sup> child poverty rate in the U.S. (January 2023) Indiana Capital Chronicle. [https://www.newsandtribune.com/news/indiana-has-the-20th-highest-child-poverty-rate-in-u-s-at-17-6/article\\_02256026-8bc3-11ed-8702-4f20bcc7d624.html#:~:text=Mississippi%20has%20the%20highest%20child,United%20States%20for%20a%20reason](https://www.newsandtribune.com/news/indiana-has-the-20th-highest-child-poverty-rate-in-u-s-at-17-6/article_02256026-8bc3-11ed-8702-4f20bcc7d624.html#:~:text=Mississippi%20has%20the%20highest%20child,United%20States%20for%20a%20reason)
- <sup>v</sup> Purdue Center for Early Learning (October 2021). On My Way PreK, Indiana Early Learning Pilot Program Final Report, Evaluation 2015-2021. <https://www.in.gov/fssa/carefinder/files/OWMPK-Purdue-Evaluation-Report.pdf>
- <sup>vi</sup> Finders, J. (2021). On My Way PreK Research Report, summary of findings. <https://www.in.gov/fssa/carefinder/files/OMWPK-2-Study-Summary-Report-0122.pdf>
- <sup>vii</sup> For complete references and full descriptions of the measures used in the study, see the Evaluation report, Nores, M., Harmeyer, E., Connors-Tadros, L., Li, Z. & Contreras, C. (2023) Evaluation of the Early Childhood Programs and Child Development in Indiana. Report 2. New Brunswick, NJ: National Institute for Early Education Research.
- <sup>viii</sup> These measures are standardized at a mean (average) score of 100 and with a standard deviation of 15. Standard scores under 100 points signify developmental levels below average for children this age.
- <sup>ix</sup> As shown in report 1 for the project. See Nores, M., Harmeyer, E., Connors-Tadros, L., Li, Z., & Contreras, C. (2022). Evaluation of the Early Childhood Programs in Indiana. Report 1. New Brunswick, NJ: National Institute for Early Education Research.
- <sup>x</sup> Vocabulary, literacy, and math measures are standardized (at a mean score of 100 and with a standard deviation of 15). As the instruments were standardized with normative samples several years back, the standardized scores and gains can feasibly help understand the sample in the study relative to pre-pandemic conditions.
- <sup>xi</sup> See Table B.4. on page 80 in: Kopack Klein, A., Aikens, N., Li, A., Bernstein, S., Reid, N., Dang, M., Blesson, E., Rakibullah, S., Scott, M., Cannon, J., Harrington, J., Larson, A., Malone, L., Tarullo, L. *Descriptive Data on Head Start Children and Families from FACES 2019: Fall 2019 Data Tables and Study Design. OPRE Report #2021-77*. Washington, DC: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research, and Evaluation. <https://www.acf.hhs.gov/opre/report/descriptive-data-head-start-children-and-families-faces-2019-fall-2019-data-tables-and>
- <sup>xii</sup> We therefore conducted multivariate estimates to examine the significance in child gains of being enrolled in different program types and settings. Results showed few differences in pre-K children’s development by type of program (i.e., LEA, center-based, home, others), by urbanicity or by PTQ rating.
- <sup>xiii</sup> CLASS Emotional Support scores were also positively associated with the DCCS executive function gains in the raw measure, although these do not include 4C sites. Females seem to systematically perform better in literacy, and older children in receptive vocabulary (while statistically significantly performing less well than their younger peers in math). White children evidence statistically significant higher gains in receptive vocabulary and lower gains in math.

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<sup>xiv</sup> Bustamente, A., Dearing, E., Zacchrisson, H., & Vandell, D. (March/April 2022). Adult Outcomes of Sustained High Quality Early Child Care and Education Programs; Do They Vary by Family Income? *Child Development*, Volume 93, Issue 2, pages 502-523.

<https://srcd.onlinelibrary.wiley.com/doi/10.1111/cdev.13696>

<sup>xv</sup> Mapt Solutions (August 2022). Early Care and Education: Overview and Situational Analysis.

<https://www.in.gov/fssa/carefinder/files/ELAC-Meeting-August-22.pdf>