



Michigan Transitional Kindergarten: Impacts on Early Education Enrollment and Student Achievement through Third Grade



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Policy Issue

In recent years, several states have expanded a new publicly funded learning option: Transitional Kindergarten (TK). TK programs bridge prekindergarten and kindergarten in their eligibility, requirements, and design. Thousands of young children attend Michigan TK programs each year (also known as “Young Fives” and “Developmental Kindergarten”). In an [earlier brief](#), we described the features of TK programs in Michigan. In this brief, we report on two new analyses: 1) how TK interacts with other early learning options in the state, and 2) the impact of attending TK on student learning.

Much of the data used for this project was structured and maintained by the MERI-Michigan Education Data Center (MEDC). MEDC data is modified for analysis purposes using rules governed by MEDC and are not identical to those data collected and maintained by the Michigan Department of Education (MDE) and/or Michigan’s Center for Educational Performance and Information (CEPI). Results, information, and opinions solely represent the analysis, information, and opinions of the authors and are not endorsed by, or reflect the views or positions of grantors, MDE, CEPI, or any employee thereof. This research was funded with help from the Smith Richardson Foundation, as well as training grants R305B20011 and R305B170015 from the U.S. Department of Education’s Institute of Education Sciences.

Key Findings

1

The introduction of TK in Michigan substantially increased the number of children attending a state-funded early education program in the state. Some children enrolled in TK instead of opting for a waiver to enroll in kindergarten before turning five. Other children enrolled in TK instead of Michigan's state-funded Pre-K, known as the Great Start Readiness Program (GSRP). However, the newly available GSRP spots were filled, resulting in more children served in state-funded options overall.

2

The availability of TK increased the proportion of families who chose to delay kindergarten entry, often referred to as "redshirting." Moreover, access to TK led to a larger increase in redshirting among economically disadvantaged children, consistent with the fact that financial circumstances influence families' early education choices in the absence of a publicly-funded option.

3

Enrolling in TK improved children's 3rd grade math test scores by 0.29 standard deviations. We also find suggestive evidence of gains in English Language Arts. These gains are measured relative to a group of children that attended other preschool programs (e.g., state-funded Pre-K, Head Start, and private programs), other formal care options, and informal care arrangements. TK's impacts are notably large relative to most of the prior Pre-K literature.

Background

The landscape of publicly funded early learning options is a complicated patchwork. Most states have at least one public option for four-year-olds from economically disadvantaged families, and several states have multiple such programs. Recently, a handful of states have expanded a relatively new type of program known as Transitional Kindergarten (TK) that bridges prekindergarten (Pre-K) and kindergarten in its eligibility, requirements, and design. TK is a public school-based option for four- and/or five-year olds. Unlike most publicly funded Pre-K programs, TK is available to all age-eligible children regardless of family income.



In partnership with the Michigan Department of Education, our team is conducting the first systematic research on Michigan TK (also known as “Young Fives” and “Developmental Kindergarten”). In addition to analyzing student-level longitudinal data, we have surveyed administrators in districts that do and do not have TK programs, conducted a pilot survey in one district with parents, and interviewed teachers and administrators about their experiences with the program. In our [first policy brief](#) released last year, we examined which districts have adopted TK programs and described the key features of their programs.¹ In the current policy brief, we provide additional information about TK enrollment patterns in Michigan as well as achievement effects through 3rd grade.



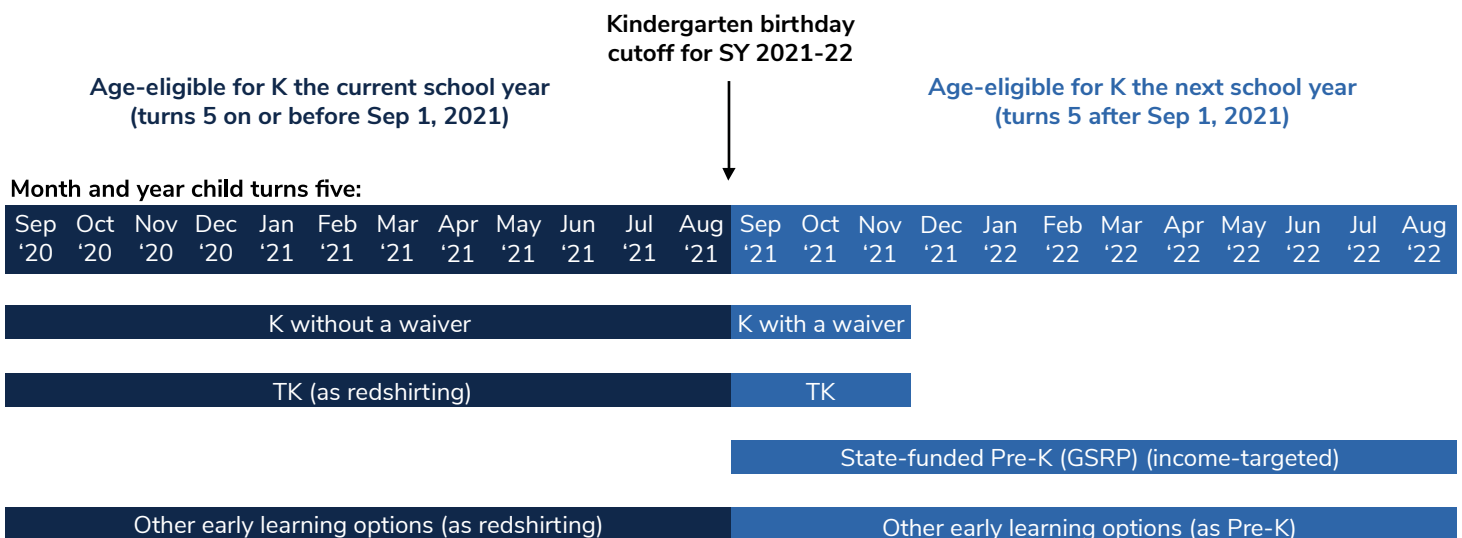
What TK Looks Like in Michigan

Michigan TK is a district-led, publicly funded early learning option. In our focal years, while each district decided whether to offer the program and had wide latitude over its design, a few policies applied to all TK programs in the state.² TK operated solely in public schools, unlike most other publicly funded early childhood programs that operated in both public schools and community-based centers. The state funded TK at the same per-child rate as K-12, and TK teachers had to meet the same education and certification requirements as their K-12 counterparts.³

According to state rules, any child who turned 5 on or before December 1 in a given year was eligible to attend TK

programs (see Figure 1). Unlike other state-funded and federally-funded early learning options in Michigan, eligibility was not restricted based on family income or other indicators of need. In other words, TK is a universal rather than a targeted early childhood program.⁴ Surveys of district administrators revealed that virtually all districts permitted children with summer and fall birthdays to enroll in TK programs, while somewhat more than half allowed children with spring birthdays to attend.⁵ For children with fall birthdays, TK served as an alternative to Pre-K and other child care because they were too young to enroll in kindergarten (without a waiver). For children with summer or spring birthdays, who were age-eligible for kindergarten without a

Figure 1: Early Learning in Options in Michigan by Child Birthday



waiver, TK provided families with a way to delay kindergarten entry (often called “red-shirting”). Figure 2 summarizes some of the key features of TK programs in Michigan, which we described in more detail in our [earlier brief](#).⁶ We also describe some of these key features in the rest of this section.

TK teachers must meet the same education and certification requirements as K-12 teachers and are compensated at parity with K-12 teachers.

This stands in stark contrast to Michigan’s Pre-K program (called the Great Start School Readiness Program, or GSRP), which does not require teachers to have the same certification as K-12 teachers and receives only about 60% of the average per child funding of \$14,347 in K-12.

TK programs use skill-specific curricula.

Michigan districts have the ability to determine which curricula to use in their TK programs, and most report using several academically-focused, skill-specific curricula. On average, district administrators report using an average of 3.5 curricula in their TK programs and 66% of responding districts report using curricula covering both literacy and math. About 40% of districts primarily use Pre-K curricula in their TK program, 38% use kindergarten curricula, and about 22% use an equal mix of both. In contrast,

the vast majority of state Pre-K and Head Start programs in Michigan and nationally use comprehensive curricula that have been regularly outperformed by other options.⁷



TK is full day.

97% of administrators reported that TK is offered full-day and matches the K-12 calendar. In contrast, most of Michigan’s state-funded Pre-K classrooms offer four days per week and fewer weeks per year than K-12. Longer program hours are beneficial to working parents and can improve children’s learning outcomes via additional instructional time.⁸

Figure 2: Michigan TK Program Features



63% of districts offer TK in every elementary building



89% of districts use TK-only classrooms (not mixed with K)



97% of districts offer a full-day TK program



The average TK classroom class cap is 19 students



On average, TK teachers receive 34 hours of professional development per year



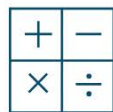
86% of districts serve TK enrollees with IEPs in their general education TK classrooms

Curricula Used in TK



94%

Literacy specific



69%

Math specific



37%

SEL specific



16%

Comprehensive (covers all learning domains)



3%

District-created only (cannot determine learning domains)

Notes: TK teacher professional development hours per year (mean=34, SD=11, min=2, max=70), TK class cap (mean=19, SD=3, min=13, max=31).

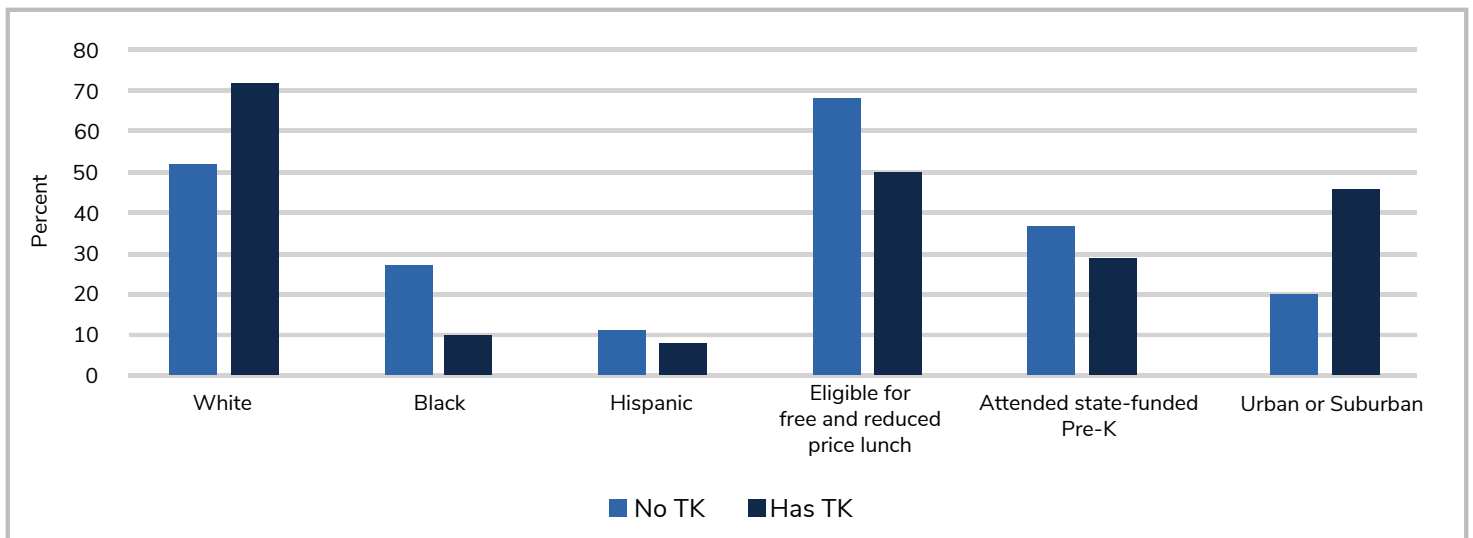
N=153. Respondents were asked, “Which curriculum does your district use for transitional kindergarten classrooms?” and answers were categorized into academic domains, comprehensive curriculum, or district-created only. SEL = socio-emotional learning.

TK Enrollment Across and Within Districts

As highlighted in our earlier [policy brief](#), districts that offered TK were more likely to be in suburbs and towns and to serve fewer children from historically disadvantaged groups. Figure 3 shows how student demographics and urbanicity differed across districts that did and did not offer TK in the 2021-22 school year. Districts offering TK were also substantially larger than those that did not. For example, districts with TK

programs had roughly 236 kindergarten students each year compared with only 106 in districts that did not. In terms of spending, districts that offered TK spent roughly the same amount per pupil as districts that did not (\$12,161 vs. \$12,746). All districts were eligible for state funding for TK. Our research so far suggests that a variety of supply and demand factors likely influenced district decision to adopt TK or not.⁹

Figure 3: Differences Between Michigan Districts That Offered TK and Districts That did not Offer TK in 2021-2022



Note: The figure above uses administrative data from school year 2021-22. District-level designations for TK and no-TK are based on administrative records and primary data collection.¹⁰ “State-funded Pre-K” refers to students who enrolled in Michigan’s Great Start Readiness Program (GSRP) or a GSRP/Head Start blend program.

Findings

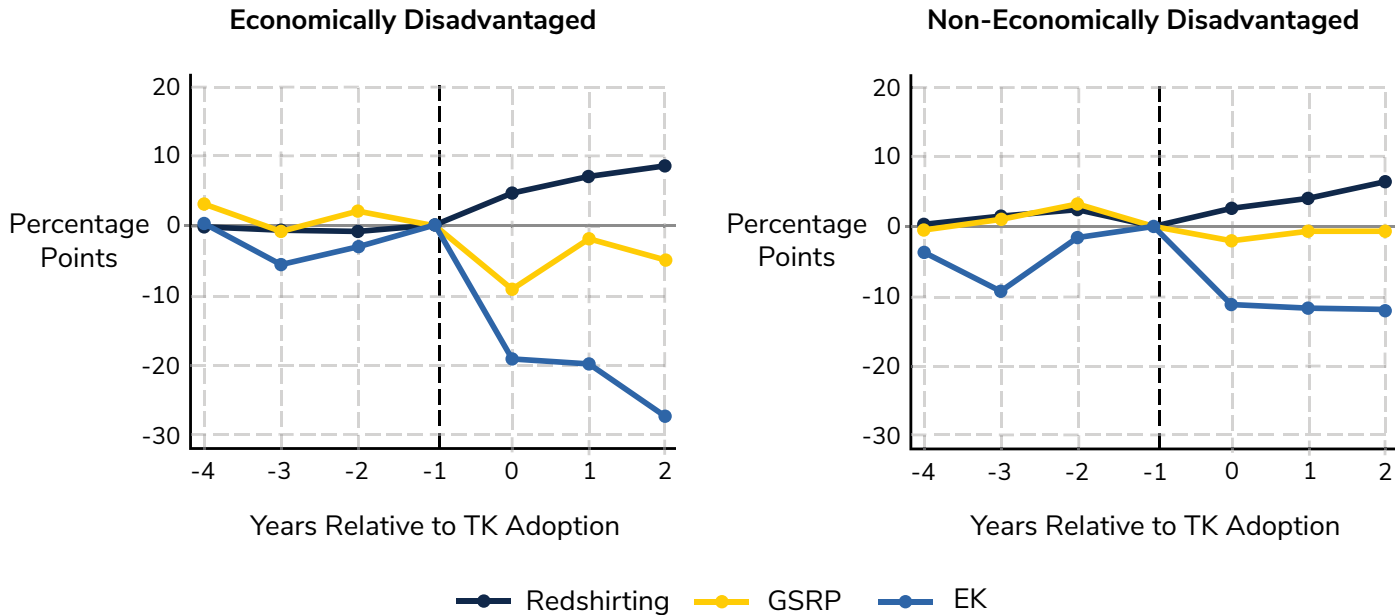
Finding 1: TK Pulled Children from Early Kindergarten and GSRP, But Expanded Overall Enrollment in State-Funded Early Childhood Programs.

TK expanded in a complex early educational landscape in Michigan that included many other options. Accordingly, it is natural to expect the availability of TK to influence the overall early childhood education landscape. To determine how access to TK impacted enrollment in other educational options, we conducted two analyses: one that examined changes over time in 14 districts with the most reliable data on TK enrollment over the

past ten years, and a second that examined all districts in SY 2020-21, comparing those that offered TK versus those that did not. Both analyses pointed to similar findings, which we summarize here (see Figure 4). For a more detailed explanation of these analyses, see Berne et al., 2024.¹¹

We began by examining impacts on enrollment in early kindergarten entry (EK) and GSRP, both of which are Pre-K year options. For these analyses we limit our sample to children born in the fall because younger children are not eligible for TK in their Pre-K year.

Figure 4: Changes in Early Learning Option Participation After a District Adopts TK



Note: GSRP=Great Start School Readiness Program; EK=Early Kindergarten (by waiver). These estimates come from statistical models that compare enrollment trends in districts with and without TK, using administrative student data. The set of districts with TK includes 14 districts that adopted TK between SY 2016-17 and SY 2020-21. The comparison group includes all 206 districts that never had TK between SY 2012-13 and SY 2021-22. The redshirting estimates are for all children in a kindergarten cohort. The GSRP and EK estimates are only for children born in the fall since other children are not age-eligible for TK at four years old. See endnotes for a more detailed explanation of these analyses.¹²

First, we found that the introduction of TK reduced the likelihood of children entering kindergarten early. Among economically disadvantaged children (the left panel in Figure 4), the fraction choosing to waive into kindergarten early dropped by roughly 20-30 percentage points following the introduction of TK. Given that roughly 50 percent of these children would have enrolled in kindergarten early in the absence of TK, this is a sizable decline. Among other children (the right panel in Figure 4), early kindergarten entry declined by around 10 percentage points—a much smaller, but still substantial, decrease.

Second, we found that access to TK led some economically disadvantaged children to substitute away from GSRP, the state's income-targeted Pre-K program. Among children with fall birthdays—the subset of TK-eligible children who were age-eligible for GSRP—there was a decline in GSRP enrollment of about 6 percentage points (from a baseline of 29 percent).¹³ However, when we looked at the number of children across all birth months attending GSRP programs in these districts, we did not see a decline following the introduction of TK programs. Thus, we believe that when TK programs drew some children (those with fall birthdays) from GSRP, it opened spots in these programs for other children. In this way, TK did not crowd out GSRP, but rather

expanded the total number of state-funded early childhood spots. Unfortunately, data limitations prevented us from investigating how capacity in private early learning options changed after districts adopted TK.

Finding 2: TK Increased the Prevalence of Kindergarten Redshirting, Particularly Among Economically Disadvantaged Children.

Some parents choose to delay children's entry into kindergarten, either because of a concern that a child may not be cognitively or emotionally prepared to start school or a belief that starting school later conveys academic, social, and/or physical advantages.¹⁴ In such cases, families must keep children at home or enroll them in some type of (usually paid) early learning option. Nationally, there are clear sociodemographic differences in kindergarten redshirting that are likely a result of variation in parent preference, unequal access to public programs, and the cost of redshirting.¹⁵

Interestingly, in Michigan districts where TK was not available, we found no sociodemographic gaps in redshirting: roughly 4% of children (born in any month) redshirted regardless of economic disadvantage status. Figure 4 shows that in TK districts, access to TK increased the prevalence of redshirting, particularly

among economically disadvantaged children. In those districts, the proportion of economically disadvantaged households choosing to delay kindergarten entry increased by 9 percentage points (from a baseline of 4 percent) with the availability of TK. Among non-economically disadvantaged households, rates increased by 5 percentage points (from a baseline of 5 percent). Our findings suggest TK provided more equitable access to redshirting, though previous research is mixed regarding whether redshirting improves children's longer-term outcomes or not.¹⁶

Finding 3: TK Improved Children's 3rd Grade Math Scores.

In assessing the overall effectiveness of Michigan TK, one important outcome to consider is academic achievement. However, it is challenging to infer the impact of TK simply by comparing the outcomes of TK participants with those of other children. The reason for this is that—as discussed above—children who participate in TK programs differ from their peers in several other ways that might independently affect their academic performance, including gender, socioeconomic status, and the presence of a documented learning disability.

To address this methodological challenge, we used a statistical approach that leverages

the age-based cutoff for TK. Under state policy, Michigan children who turned five by December 1 of a given school year were eligible for TK; children who turned five on December 2 or later were not eligible (see Figure 1). Hence, children with birthdays on either side of this largely arbitrary cutoff had dramatically different TK enrollment rates: roughly 37% of children born in November or on December 1 enrolled in TK while no children with other December birth dates did so. The benefit of this approach is that there were no meaningful differences in other student characteristics across the cutoff. For example, children with late November birthdates were virtually identical to their peers with early December birthdays in gender, race, family income, neighborhood, and presence of a learning disability. Hence, by comparing children on either side of the birthdate cutoff, we can learn about the impact of participating in TK. We describe this statistical method, known as a Regression Discontinuity Design, and the sample used for our analysis in greater detail in Berne et al. (2024).¹⁷

We found that enrolling in TK in the Pre-K year improved student performance on Michigan's 3rd grade math exam by 0.29 standard deviations (see Figure 5). To put our estimated effect in context, the math improvement we found amounted to 61% of expected cognitive development

between 3rd and 4th grade in Michigan.¹⁸ We also found suggestive evidence that TK participation led to positive (but smaller) effects on English Language Arts performance, although we lacked the statistical precision to make a definitive statement.¹⁹

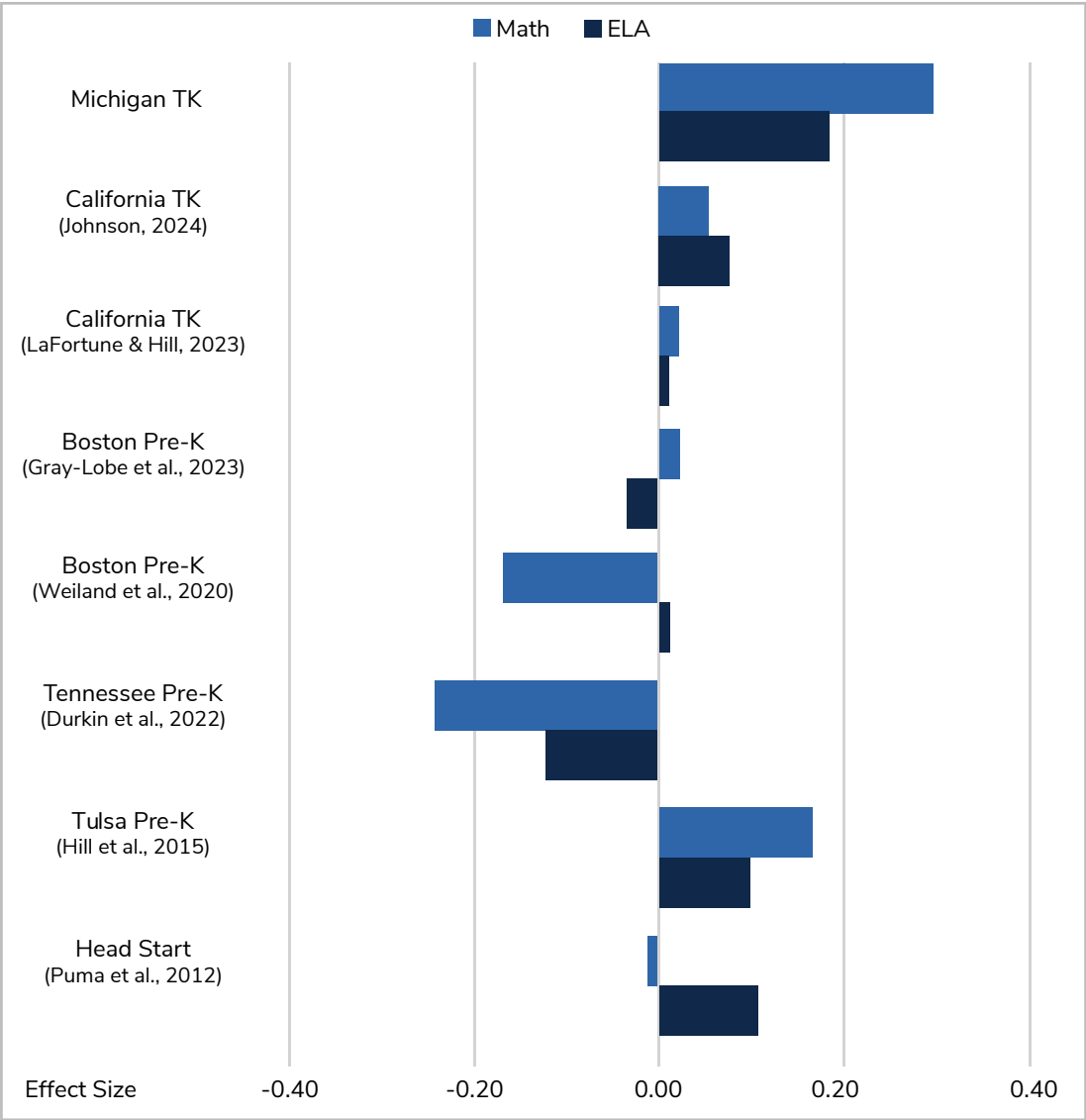


Importantly, TK impacted children's outcomes above and beyond "business as usual" educational experiences. Many children in the comparison group attended other preschool programs like Head Start, GSRP, and private programs (see Appendix Table 1).

These TK gains are persistent and large relative to the prior literature. Across all relatively rigorous evaluations of programs since the 1960s, the average impact of preschool on children's end-of-preschool cognitive skills is about 0.25 standard deviations.²⁰ As another way to contextualize

our findings, in Figure 5, we display third grade math and reading impacts for relatively recent preschool evaluation studies. These studies vary in their geographic focus and in many key program features (i.e., universal versus targeted, curricula used, teacher education and pay). They also vary in the care settings of the comparison group. Relative to these studies, Michigan TK – and notably, CA TK – effects stand out as particularly large and persistent.

Figure 5: Effects of Early Learning Programs on Third Grade Math and Reading Scores



	Michigan TK	California TK (Johnson, 2024)	California TK (LaFortune & Hill, 2023)	Boston Pre-K (Gray-Lobe et al., 2023)	Boston Pre-K (Weiland et al., 2020)	Tennessee Pre-K (Durkin et al., 2022)	Tulsa Pre-K (Hill et al., 2015)	Head Start (Puma et al., 2012)
Research Design	Regression Discontinuity	Regression Discontinuity	Regression Discontinuity	School Assignment Lottery-RCT	School Assignment Lottery-RCT	Researcher controlled lottery assignment-RCT	Propensity Score Matching	Researcher controlled lottery assignment-RCT
Best estimate of % of comparison group in another preschool program	48	N/A	62	62	97	32	48	41

Note: All effects are reported in standard deviation units.²¹ “School Assignment Lottery-RCT” refers to programs that were oversubscribed and enrollment was determined by a lottery conducted by schools or districts. “Researcher Controlled Lottery-RCT” refers to programs that were oversubscribed and enrollment was determined by a lottery conducted by the research team. The estimated percent of students in the counterfactual enrolled in a center-based child care setting, including both private and public centers, are shown under the respective programs. The remaining students in each case could be in any of the following care arrangements: at home with a parent, at home with a care-taker other than parents, or in a family child care home.²²

Table 1: Estimated Proportion of Michigan 4-year-olds Enrolled in Different Care Settings in 2015 and 2019 in all Districts with Reliable Student-Level Transitional Kindergarten Enrollment Data

Panel A. 2015 Cohort						
	Transitional Kindergarten	Early Kindergarten Entry	GSRP	Head Start	Other Licensed Child Care	Residual Care Arrangements
Mean	5%	5%	20%	10%	13%	46%
25th Percentile	2%	3%	7%	2%	8%	29%
75th Percentile	7%	7%	28%	11%	19%	61%
Panel B. 2019 Cohort						
	Transitional Kindergarten	Early Kindergarten Entry	GSRP	Head Start	Other Licensed Child Care	Residual Care Arrangements
Mean	11%	6%	20%	8%	14%	42%
25th Percentile	7%	3%	8%	1%	8%	29%
75th Percentile	14%	8%	31%	11%	19%	56%

Note: These enrollment rates are calculated using student-level administrative data from the Michigan Education Research Institute, aggregate enrollment data from Head Start Program Information Reports, center capacity data from the Michigan Department of Licensing and Regulatory Affairs, and population and enrollment data from the American Community Survey. The rates should be seen as suggestive since they require substantial imputation.

Endnotes

1, 2, 5, 6, and 10. Shapiro, A., Berne, J., Cordoba Garcia, K., Jacob, B., Musaddiq, T., Owusu, S., & Weiland, C. (2023). *Michigan Transitional Kindergarten: A first look at program reach and features*. Ann Arbor, MI: Education Policy Initiative. <https://edpolicy.umich.edu/research/epi-policy-briefs/michigan-transitional-kindergarten-first-look-program-reach-and-features>

3. The average salary of public school teachers in Michigan is \$57,926. GSRP teachers in public schools earn \$40,412 on average. GSRP teachers in community-based organizations have a median salary of \$33,000. Nationally, the average Head Start teacher salary is \$34,073 per year. See: https://edpolicy.umich.edu/sites/epi/files/2023-12/MI%20Pre-K%20for%20All%20Report_v8_0.pdf and <https://nhsa.org/wp-content/uploads/2022/05/2022.05-Workforce-Brief.pdf>

4. Although the state does not target TK by any factor other than age, some districts reported using other information to decide which children are prioritized for TK seats (e.g., previous child care/Pre-K experience, kindergarten readiness, and meetings with teachers) (Shapiro et al., 2023).

7. Weiland, C., Chaudry, A., Shapiro, A., Berne, J., Hyland, K., Hamp, N., & Taylor, A. (2023). *An evidence-based path to expanding high-quality Pre-K in Michigan*.

Ann Arbor, MI: University of Michigan Education Policy Initiative. <https://edpolicy.umich.edu/research/epi-policy-briefs/evidence-based-path-expanding-high-quality-pre-k-michigan>.

8. Atteberry, A., Bassok, D., & Wong, V. C. (2019). The effects of full-day prekindergarten: Experimental evidence of impacts on children's school readiness. *Educational Evaluation and Policy Analysis*, 41, 537-562; Yoshikawa, H., Weiland, C., & Brooks-Gunn, J. (2016). When does preschool matter? *The Future of Children*, 26, 21-35.

9, 11, and 12. Berne, J., Jacob, B., Musaddiq, T., Shapiro, A., & Weiland, C. (2024). *Transitional Kindergarten: The new kid on the early learning block*. Providence, RI: Annenberg Work Paper. <https://edworkingpapers.com/sites/default/files/ai24-921.pdf>

13. As expected, we see virtually no change in GSRP enrollment among non-economically disadvantaged children, which is consistent with the fact that only a small fraction of these children would have been eligible for GSRP.

14 and 16. Dee, T. S., & Sievertsen, H. H. (2018). The gift of time? School starting age and mental health. *Health Economics*, 27(5), 781-802.; Deming, D., & Dynarski,

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S. (2008). The lengthening of childhood. *Journal of Economic Perspectives*, 22(3), 71-92.; Huang, F. L. (2015). Investigating the prevalence of academic redshirting using population-level data. *AERA Open*, 1(2).

15. In the U.S. as a whole, 5.9 percent of all kindergarten-aged children redshirted in SY 2010-11. Among children whose family income was below 200% of the poverty threshold, 4.8 percent redshirted; among children whose family income was 200% of the poverty threshold or above, 7.3 percent redshirted (Digest of Education Statistics, 2012; see: https://nces.ed.gov/programs/digest/d12/tables/dt12_136.asp). Huang, F. L. (2015). Investigating the prevalence of academic redshirting using population-level data. *AERA Open*, 1(2).

17. Berne, J., Jacob, B., Musaddiq, T., Shapiro, A., & Weiland, C. (2024). The effect of early childhood programs on third-grade test scores: Evidence from Transitional Kindergarten in Michigan. *American Economic Association Papers and Proceedings*, 114, 480-485.

18. This is based on the average growth of Michigan students from grade 3 in 2017-18 to grade 4 in 2018-19, which is nearly identical to estimates found in other literature (Hill et al., 2008). Hill, C. J., Bloom, H. S., Black, A. R., & Lipsey, M. W. (2008). Empirical benchmarks for interpreting

effect sizes in research. *Child Development Perspectives*, 2(3), 172-177.

19. These estimates are not statistically different than zero. See Berne et al., 2024 for detailed estimates. Berne, J., Jacob, B., Musaddiq, T., Shapiro, A., & Weiland, C. (2024). The effect of early childhood programs on third-grade test scores: Evidence from Transitional Kindergarten in Michigan. *American Economic Association Papers and Proceedings*, 114, 480-485.

20. Duncan, G. J., & Magnuson, K. (2013). Investing in preschool programs. *Journal of Economic Perspectives*, 27(2), 109-132.

21. The impacts were estimated using the following standardized tests for math and ELA in third grade: The Michigan TK study (Berne et al., 2024) used the Michigan Student Test of Educational Progress Assessment (M-STEP); the California TK study (Johnson, 2024) used Smarter Balanced; the California TK study (LaFortune & Hill, 2023) used the Smarter Balanced Summative Assessments, the Boston Pre-K study (Gray-Lobe et al., 2023) used test scores from the Massachusetts Comprehensive Assessment System (MCAS), the Boston Pre-K study (Weiland et al., 2020) used scores from Massachusetts Comprehensive Assessment System (MCAS) and Partnership for Assessment of Readiness for College and

Endnotes

Careers (PARCC) assessment, the Tennessee Pre-K study (Durkin et al., 2022) used scores from state achievement tests under the Tennessee Comprehensive Assessment Program (TCAP), the Tulsa Pre-K study (Hill et al., 2015) used the Oklahoma Performance Index which is a scaled score based on the Oklahoma Core Curriculum Test, and the Head Start Impact Study (Puma et al., 2012) used scores from the ECLS-K Reading and WJ III Applied Problems assessments.

22. For the Michigan TK study (Berne et al., 2024), the estimated proportion of counterfactual students in child care centers was based on proportion of four-year olds in TK districts enrolled in a center-based preschool setting (and EK) in 2015 and 2019. For the California TK (LaFortune & Hill, 2023), the counterfactual group was not directly observed and estimate for percent of children of the relevant age group in the state enrolled in a center-based setting was based on the National Household Education Survey of 2016. The counterfactual for the Boston Pre-K study by Gray-Lobe et al. (2023) was also not directly observed and was based on the authors estimates of change in proportion of students enrolled in public Pre-K (Head Start) and private preschool due to the expansion of the Boston Pre-K program. For the Boston Pre-K study by Weiland et al. (2020), the counterfactual statistic was based on the

care setting of students in the control group as reported by parents. The Tennessee Pre-K study (Durkin et al., 2022) did not have information on the care arrangement for the full sample of comparison students in the RCT analytic sample and estimated the proportion of counterfactual students enrolled in a center-based setting through parent interviews of children for a sub-sample sample of students that had similar characteristics to students in the full RCT analytic sample. The estimate for the counterfactual for Tulsa Pre-K study (Hill et al., 2015) was based on a survey of parents; the survey, however, had low response rate for questions related to type of care in child's Pre-K year and was administered when students were in third grade with potential recall problems of respondents. For the Head Start study (Puma et al., 2012), we reported the counterfactual estimated for the program by Bloom & Weiland (2015), which came from program records and parent surveys. With the exception of the Tulsa Pre-K program, all estimates for the proportion of counterfactual enrolled in center-based settings were based on an intent-to-treat sample.