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How well do kindergarten assessments predict third-grade test scores? Evidence from Michigan

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How well do kindergarten assessments predict third-grade test scores? Evidence from Michigan

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Nationally, 45 states and DC require student assessments prior to third grade. We examine how well three assessments used to measure children's skills in kindergarten—the Kindergarten Readiness Assessment (KRA), NWEA, and i-Ready—predict third-grade test scores in Michigan. Our findings help illuminate the importance of strong kindergarten skills and can inform assessment choices in the early years in Michigan and beyond.

Key Findings[1]

• The KRA, NWEA, and i-Ready assessments predicted third-grade reading and math skills. For example, students who scored one standard deviation higher on the spring math NWEA were 21 percentage points more likely to be proficient in math in third grade.

• KRA and NWEA scores were more predictive than i-Ready scores.

• Assessments were similarly predictive for economically disadvantaged children and their non-economically disadvantaged peers.

Background

Nationally, 45 states and DC require student assessments prior to third grade.[2] These assessments have different purposes, including identifying kindergarten readiness, screening for learning difficulties or developmental concerns, and monitoring student progress. As states invest in Science of Reading,[3] these data can also provide critical information on the success of these reforms, ahead of the state standardized third-grade assessments that are required by federal law.

In Michigan, from 2017 to 2019, the state used the Kindergarten Readiness Assessment (KRA).[4] Starting in 2016 and until 2026, under the Read by Grade Three Law, Michigan also mandated that districts choose a K-2 benchmark assessment, with the most popular choices being NWEA[5] and i-Ready.[6]

These assessments are central to two of our recent evaluations of Michigan education policy. Our first study evaluated the impact of enrolling in Transitional Kindergarten (TK), a publicly funded early learning option for 4- and 5-year old children in the year before regular kindergarten.[7] Our second study evaluated Michigan's Read by Grade Three Law, which uses benchmark assessment scores beginning in kindergarten to identify students who need additional support to be proficient in reading by the end of third grade.[8]

In this brief, because of limited research comparing the predictive validity of such assessments and to better understand our previous findings, we examine how these assessments predict a key outcome in both of our prior studies: performance on the state standardized test in third grade. Our findings help illuminate the importance of strong kindergarten skills and can inform assessment choices in the early years in Michigan and beyond.



Methods

Research Questions

1. How predictive are KRA, NWEA, and i-Ready kindergarten assessments of children's performance on state standardized tests in third grade?

2. Are these assessments similarly predictive for students who are and are not economically disadvantaged?

Samples

We study five samples defined by the type and timing of children's kindergarten assessment. The samples are limited to students with a valid score on a kindergarten assessment and, years later, on the state standardized test in third grade.[9] Specifically, we analyze:

- 20,655 students who took the **Kindergarten Readiness Assessment** in fall 2018
- 7,836 students who took **fall NWEA** assessments in 2021-22 or 2022-23
- 9,764 students who took **spring NWEA** assessments in 2021-22 or 2022-23
- 4,254 students who took **fall i-Ready** assessments in 2021-22 or 2022-23
- 4,095 students who took **spring i-Ready** assessments in 2021-22 or 2022-23

These assessments were only administered in select districts, and our five samples are not representative of all Michigan kindergarteners. For example, Appendix Table 1 shows that students in the NWEA and i-Ready samples are substantially more likely to have attended a Title I-eligible school than the average Michigan kindergartener. Students in the KRA sample are disproportionately White, and students in the i-Ready sample are disproportionately Black. Despite these differences, the general consistency of our findings across samples suggests that the kindergarten assessments would likely be predictive for students in other parts of the state too.

Measures

Our data come from longitudinal administrative records on the universe of Michigan public school students. The data include student demographics, school and district enrollment, and state standardized test scores (grades 3 through 8). In our analysis, we use student-level demographic information on gender, race, eligibility for subsidized school meals, having an individualized education program (IEP), and being an English learner.

The KRA assessment measures children's language and literacy, math, physical wellbeing and motor development, and social skills.[10] We focus primarily on composite scores, though we show findings by subdomain in Appendix Figure 1. For ease of interpretation, we standardize all KRA scores using means and standard

deviations from the universe of KRA test-takers in Ohio. The NWEA[11] and i-Ready[12] assessments measure students' literacy and math skills three times per year. For brevity, we focus on the mid-fall and late spring collections. As with the KRA scores, we standardize the NWEA and i-Ready scores using subject-specific means and standard deviations publicly provided by the two vendors.

Analytic Approach

To assess the predictive validity of the kindergarten assessments, we examine how strongly kindergarten assessment scores are associated with performance on Michigan's third-grade state standardized tests. Specifically, the outcome is whether a student scores at or above the "proficient" threshold on the third-grade math and English Language Arts (ELA) assessments.

We estimate separate regression models for each kindergarten assessment and third-grade subject. For NWEA and i-Ready, we predict third-grade ELA proficiency using kindergarten literacy scores, and we predict third-grade math proficiency with kindergarten math scores. For our main KRA results, we use the composite score, though we show results by subdomain in Appendix Figure 1. All models control for student demographics.

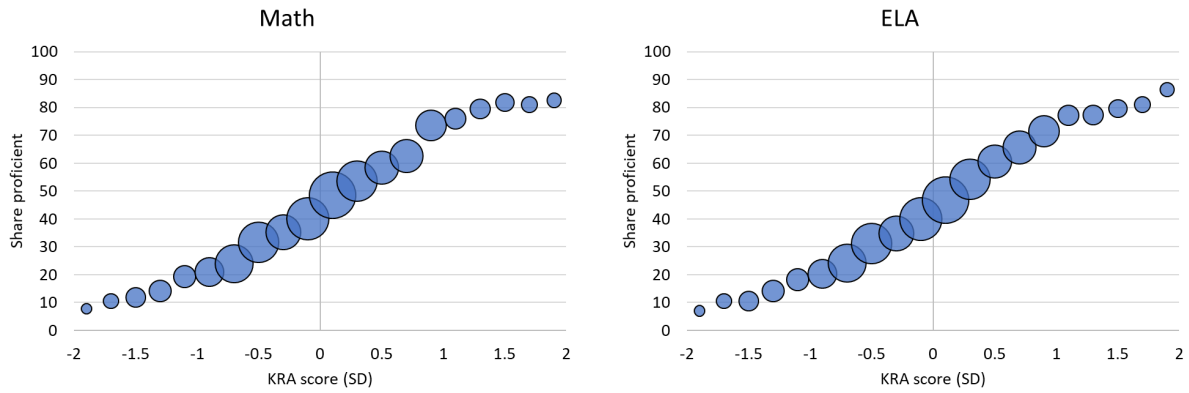
In results not shown here, we obtain similar results when the outcome is a standardized test score (rather than a proficiency indicator) and when we control for the school a student attends. In Figure 3 below, we estimate models separately based on student economic disadvantage status (as defined by the Michigan Department of Education).



Findings

Figure 1 shows—without controlling for student demographics—a strong, positive relationship between KRA scores and proficiency on third-grade assessments. Plots are qualitatively similar for NWEA and i-Ready. Among students with KRA scores at the median (i.e., near 0 standard deviations), around 40%-50% were proficient in math and reading at the end of third grade. Among those who scored one standard deviation (SD) higher in kindergarten, around 75% were proficient in math and ELA in third grade.[13]

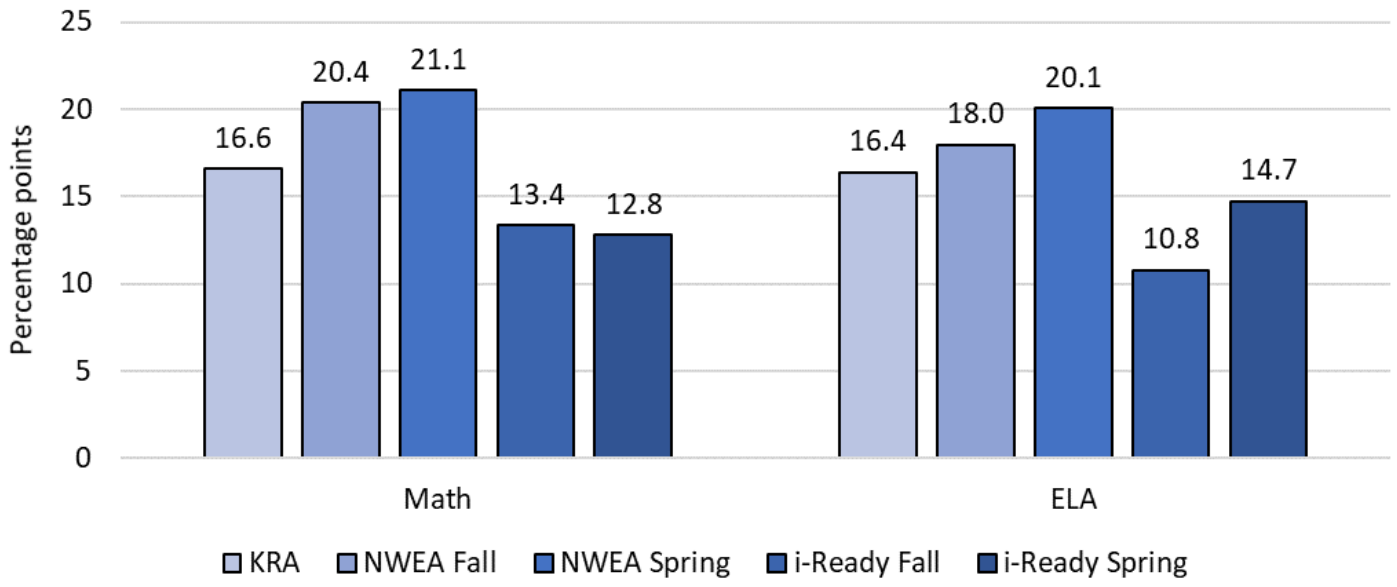
Figure 1. Students With Higher KRA Scores Are More Likely to Score "Proficient" on Third-Grade Standardized Tests



Note: These plots depict the share of students who scored above the "proficient" threshold on Michigan's statewide standardized test in math and ELA in third grade. The x-axis is a student's overall score in standard deviation (SD) units on the Kindergarten Readiness Assessment (KRA) in fall 2018. The KRA scores are grouped into bins with widths of 0.2 SDs. The y-axis shows the share of students within a KRA bin who are proficient in a given subject on the third-grade test. Marker size is proportional to the number of students in each KRA bin. N = 20,655.

In Figure 2, we compare the predictiveness of the three assessments for third-grade proficiency after controlling for student demographics. Within each assessment, we obtain similar results for third-grade math and ELA. Overall, the NWEA has the strongest predictive validity: for example, students who scored one standard deviation higher on the spring math NWEA were 21.1 percentage points more likely to be proficient in math in third grade, on average. The KRA is slightly less, but overall similarly, predictive. The i-Ready is also predictive, but somewhat less so compared to the other two assessments. All of the estimates are statistically significant at the 1% level.

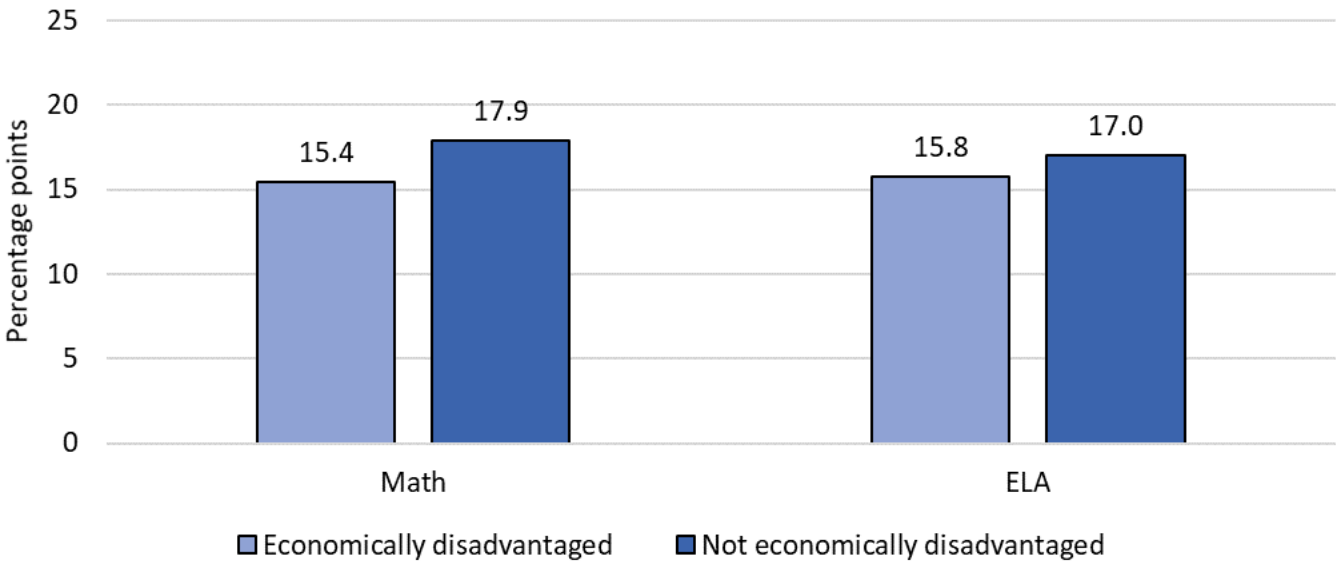
Figure 2. Kindergarten Assessments Remain Predictive of Third-Grade Test Scores After Controlling for Demographics



Note: This plot shows estimates from regression models that predict third-grade proficiency using kindergarten assessment scores and controlling for student demographics. Each estimate is the predicted increase in the probability of being proficient in third grade associated with a 1 standard deviation increase in kindergarten assessment scores. We use KRA composite scores to predict third-grade math and reading. For NWEA and i-Ready, we predict third-grade math proficiency with kindergarten math scores, and third-grade ELA proficiency with kindergarten literacy scores. All estimates are significant at the $p<0.01$ level.

As we show in Figure 3, predictive validity is similar by student economic disadvantage status. Note that we limit this analysis to the KRA sample because it is the largest.

Figure 3. Kindergarten Assessments Are Predictive of Third-Grade Test Scores for Students Who Are and Aren't Economically Disadvantaged, Controlling for Demographics



Note: This plot shows estimates from regression models that predict third-grade proficiency using fall KRA composite scores and controlling for student demographics. We only show KRA results because this assessment has the largest sample. Each estimate is the predicted increase in the probability of being proficient in third grade associated with a 1 standard deviation increase in kindergarten assessment scores. All estimates are significant at the $p<0.01$ level. N = 9,564 for economically disadvantaged students; N = 11,091 for non-economically disadvantaged students.

Conclusion

Our descriptive findings show that kindergarten assessments provide an early signal of children's trajectories in their critical elementary school years. Our findings are highly relevant in Michigan, where districts use a patchwork of assessment tools and state assessment policy continues to evolve.

More broadly, our findings can help inform state and district leaders—in Michigan and elsewhere—as they consider which assessments to adopt and how to interpret early assessment data to support students most effectively.

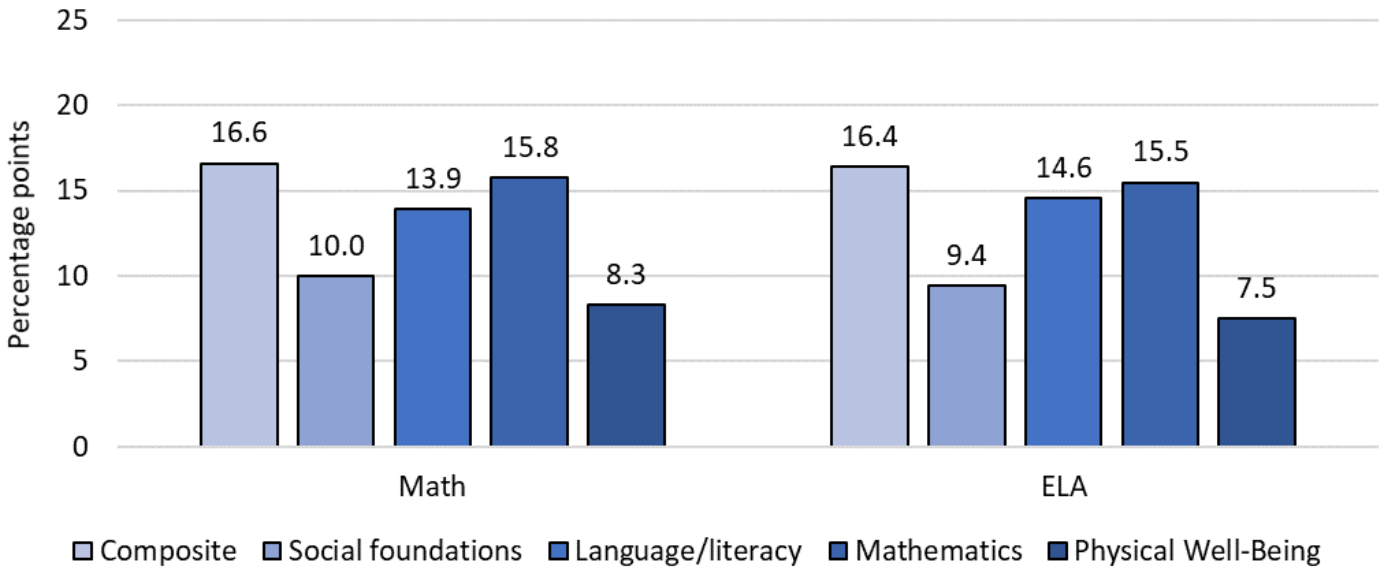
Appendix

Appendix Table 1. Characteristics of Students in Each Assessment Sample

	SY 2018-19		SY 2021-22 and SY 2022-23				
	All students	KRA	All students	NWEA fall	NWEA spring	i-Ready fall	i-Ready spring
Student characteristics							
Female	48%	49%	48%	49%	50%	50%	50%
White	64%	74%	62%	64%	67%	16%	17%
Black	22%	12%	23%	20%	19%	71%	70%
Hispanic	9%	11%	9%	11%	10%	11%	12%
Asian	4%	2%	5%	3%	3%	1%	1%
Other race/ethnicity	1%	1%	1%	2%	2%	0%	0%
Economically disadvantaged	57%	54%	58%	56%	61%	85%	84%
Has an IEP	14%	13%	15%	13%	13%	7%	7%
English learner	8%	5%	9%	8%	13%	8%	8%
School characteristics							
Charter school	12%	4%	12%	19%	14%	5%	5%
Title I eligible	79%	81%	43%	80%	83%	92%	92%
City	25%	18%	25%	14%	22%	76%	75%
Suburb	42%	32%	42%	52%	49%	9%	9%
Town	12%	19%	12%	15%	12%	7%	7%
Rural	21%	30%	21%	20%	17%	8%	8%
Share eligible for FRPL	55%	52%	56%	55%	59%	81%	81%
Share proficient on M-STEP (ELA)	44%	48%	42%	43%	40%	14%	14%
Share proficient on M-STEP (math)	41%	44%	37%	38%	35%	12%	12%
Number of students	121,512	20,655	220,185	7,836	9,764	4,254	4,095

Note: This table presents the average of several characteristics across all Michigan kindergarteners and Michigan kindergarteners in each assessment sample. We compute all averages at the student level, meaning the school characteristics are school-level averages weighted by kindergarten enrollment. The M-STEP is Michigan's statewide standardized test. IEP = individualized education program. FRPL = free- and reduced-price lunch.

Appendix Figure 1. Predictiveness of KRA Scores by Subdomain



Note: This plot shows estimates from regression models that predict third-grade proficiency using fall KRA scores and controlling for student demographics. Each estimate is the predicted increase in the probability of being proficient in third grade associated with a 1 standard deviation increase in kindergarten assessment scores. We show estimates separately by KRA subdomain.

Endnotes

[1] Acknowledgements: We thank the Michigan Department of Education (MDE), Michigan Department of Lifelong Education, Advancement, and Potential (MiLEAP), and Center for Educational Performance and Information (CEPI) for their partnership, especially Thomas Howell and Emily Laidlaw. We thank the Washtenaw Intermediate School District for sharing Michigan's Kindergarten Readiness Assessment data, especially Naomi Norman. We also thank members of the broader Read by Grade Three research team, especially Tara Kilbride, Emily Mohr, Josep Nadal-Fernandez, Tanya Wright, Katharine Strunk, and Brian Jacob. Finally, we thank Nicole Wagner Lam and Jasmina Camo-Biogradlija for assistance with data agreements and project management and Kyle Kwaiser and Thomas Staines for data management. This research used data structured and maintained by the Michigan Education Research Institute-Michigan Education Data Center (MEDC). MEDC data are modified for analysis purposes using rules governed by MEDC and are not identical to those data collected and maintained by MDE and CEPI. This research was funded by the Martha Darling and Gilbert Omenn Research Fund for Early Childhood Education. Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and do not reflect the views of any other entity.

[2] Education Commission of the States. (2026). *State K-3 Policies 2026: Does the state require assessments prior to the end of third grade?* https://reports.ecs.org/comparisons/state-k-3-policies-2026-11

[3] Council of State School Officers. (n.d.) *Science of reading implementation and legislative state scan.* https://learning.ccsso.org/science-of-reading-legislation-and-implementation-state-scan

[4] WestEd (2015). *Ready for kindergarten: Kindergarten readiness assessment technical report addendum.* https://dam.assets.ohio.gov/image/upload/v1734729963/childrenandyouth.ohio.gov/For%20Providers/Kindergarten%20Readiness/KRA_Technical_Report_Addendum_2015.pdf

[5] NWEA. (2026). *MAP Growth K–2.* https://www.nwea.org/

[6] Curriculum Associates. (2026). *i-Ready*. https://www.curriculumassociates.com/programs/i-ready-assessment

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[8] Berne, J. S., Jacob, B. A., Weiland, C., & Strunk, K. O. (2026b). Assessing the impact of grade retention: A cautionary tale of exclusion restriction violations. *Journal of Public Economics, 253, 105534.;* Strunk, K. O., Wright, T. S., Westall, J., Zhu, Q., Kilbride, T., Cummings, A., ... & Mavrogordato, M. (2022). *Michigan's read by grade three law: Year two report.* https://epicedpolicy.org/wp-content/uploads/2022/02/RBG3_Rpt_Yr2_Feb2022.pdf.

[9] For the KRA, educators could test their whole class or randomly sample around 8 students. In previous work (Berne et al., 2026a), we found evidence that sampling was not random, with selection on race/ethnicity and economic disadvantage. We use all available scores for our purposes. For NWEA and i-Ready, we used data from districts that gave permission for their data to be used in our Read by Grade Three evaluation (Berne et al., 2026b).

[10] WestEd (2015). *Ready for kindergarten: Kindergarten readiness assessment technical report addendum.* https://dam.assets.ohio.gov/image/upload/v1734729963/childrenandyouth.ohio.gov/For%20Providers/Kindergarten%20Readiness/KRA_Technical_Report_Addendum_2015.pdf.

[11] NWEA. (2026). *MAP Growth K–2.* https://www.nwea.org/

[12] Curriculum Associates. (2026). *i-Ready*. https://www.curriculumassociates.com/programs/i-ready-assessment

[13] For reference, in a standard normal distribution, a one standard deviation increase would move a student who began at the 50th percentile (i.e., the median) to the 84th percentile.