Does Access to School Meals Improve Student Outcomes?
Evidence from Community Eligibility Provision Participation in North Carolina

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Introduction

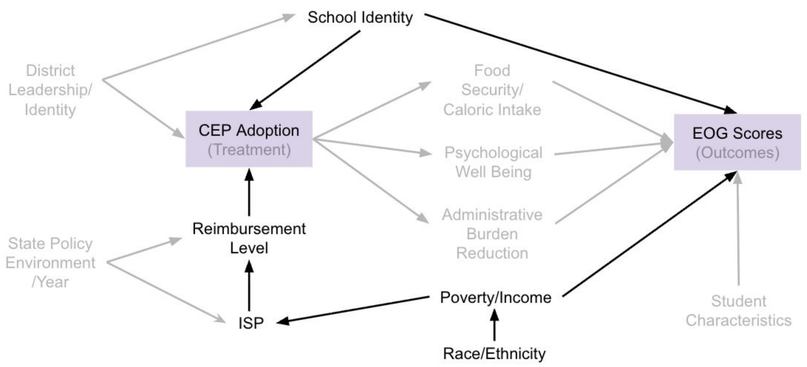
For many students in the United States, school meal programs provide a critical source of daily nutrition. Having access to food plays an important role in student health, cognitive development, and academic performance. In 2014, the U.S. Department of Agriculture introduced the **Community Eligibility Provision (CEP)** nationwide to **expand access to free school meals**. CEP allows eligible high-poverty schools to provide free breakfast and lunch to all students without requiring individual household applications. Our research looks at the impact of this program in North Carolina on student academic outcomes.

Methods

We used student-level demographic and academic outcome data from the North Carolina Education Research Data Center (2011-2019), supplemented with school-level information from the NC Department of Public Instruction and district-level economic measures from the American Community Survey-Education Tabulation.

To improve comparability between treated and never-treated schools [1], we apply eligibility restrictions by limiting treated schools to those remaining in the program after adoption and include only schools eligible for CEP at least once during the study period.

We estimate the impact of CEP adoption on elementary and middle school End of Grade (EoG) test scores using four models under the **Difference-in-Differences (DiD) framework.** We use a modern study-event [2] and staggered-adoption [3] to control the timing of treatment. We compared to a simple DiD, as most schools enter treatment in 2015. The Two-Way Fixed Effects model is added as a reference because it has been traditionally been used in previous studies on CEP adoption.



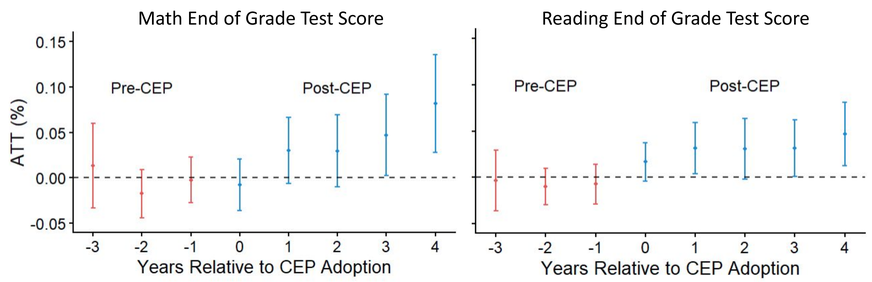
Results

Specification	Math EOG	Reading EOG	Limitations
	Average Treatment Effect on the Treated (ATT) in standard deviation units		
Event-Study DiD [2]	0.0122 (0.0114)	0.0152 (0.0080)	Requires valid comparison groups at each relative time
Staggered-Adoption DiD [3]	0.0362* (0.0116)	0.0315* (0.0089)	Aggregation choices can affect summary estimates
DiD (Cohort 2014 - 2015)	0.0122 (0.0110)	0.0091 (0.0090)	Does not account for staggered adoption of CEP by schools
Two-Way Fixed Effects (TWFE)	-0.0050 (0.0104)	0.0107 (0.0071)	Can be biased under heterogeneous treatment effects

Asterisks indicate statistical significance of differences (p < 0.05).*

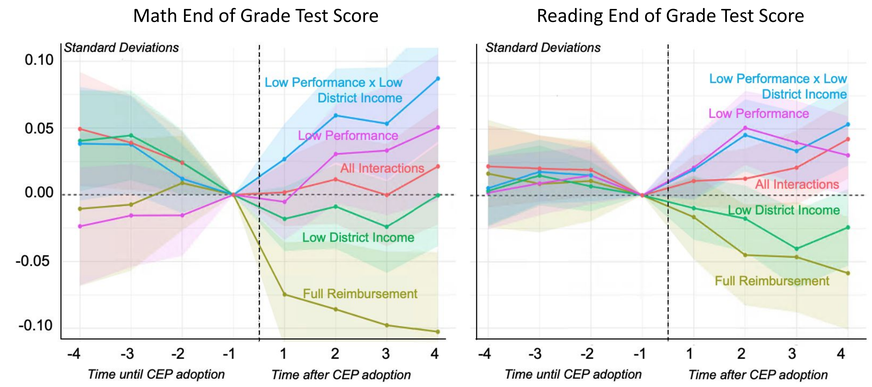
Student Test Scores Improved After CEP Adoption

Effects shown by years since CEP adoption (modern DiD, Callaway Sant'Anna)



CEP Effects Are Largest in Low-Income and Low-Scoring Schools

Effects by years since adoption and school subgroup (Sun & Abraham)



Conclusions

- **Overall effects are modest,** reaching significance under methods designed for staggered treatment adoption (Callaway & Sant'Anna).
- **Effects are strongest for students in the most vulnerable schools**: those with lower performance and lower district income.
- **At scale, a 0.03 SD improvement is meaningful:** had all eligible schools participated in 2017, on average an estimated 14,000 additional students could have passed their End-of-Grade tests: 4.5% of the failing population and 2% of all NC public school students.
- **Effects are higher than the expected by Two Way Fixed Effects.** This is the first CEP study to use modern DiD methods designed for staggered treatment adoption, reducing bias in effect estimates [2,3].

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References

1. Schneider, K. R., Oslund, J., & Liu, T. (2021). Impact of the community eligibility provision program on school meal participation in Texas. Public Health Nutrition, 24(18), 6534–6542. https://doi.org/10.1017/S1368980021003712
2. Sun, L., & Abraham, S. (2021). Estimating dynamic treatment effects in event studies with heterogeneous treatment effects. Journal of Econometrics, 225(2), 175–199. https://doi.org/10.1016/j.jeconom.2020.09.006
3. Callaway, B., & Sant'Anna, P. H. C. (2021). Difference-in-differences with multiple time periods. Journal of Econometrics, 225(2), 200–230. https://doi.org/10.1016/j.jeconom.2020.12.001