From Poverty to Performance: Educational Disparities Across California's Public Schools

Framing

The concept of school poverty, measured as the proportion of poor children attending a school, is a key variable to understand educational inequality in schools (Borman & Dowling, 2010; Carbonaro et al., 2023). There are over 6 million public school children in California attending schools with extensive variation across poverty concentration, making it essential to comprehend how these inequities determine academic outcomes. Even though previous studies had documented general achievement gaps, comprehensive school-level studies within the full scope of California's statewide public-school systems are still needed. Moreover, recent studies indicate subject-specific gaps — mathematics is more adversely impacted by school poverty compared to English Language Arts (ELA) (Kuhfeld et al., 2022). The trend is also evidenced by longitudinal studies indicating that students with extensive exposure to high-poverty schools achieve the least gains in math (Halpern-Manners, 2016; Langenkamp & Carbonaro, 2018). Whether these differential subject impacts generalize across the full breadth of California's diverse schooling landscape requires systematic investigation.

This study examines school-level associations between poverty and achievement for the entire population of California public schools, including the magnitude of these associations, as well as whether these associations vary for English Language Arts and Mathematics. By offering empirical evidence about achievement patterns throughout across California's diverse school environment, this study has the potential to inform more specific resource allocation and intervention policies.

Research Question

How does academic achievement vary by school poverty level in California public schools, and does this relationship differ between English Language Arts and Mathematics?

Data and Methods

This analysis merges two comprehensive California datasets: the 2023-24 Free and Reduced Price Meal (FRPM) enrollment data (California Department of Education, 2024) and the 2023-24 California Assessment of Student Performance and Progress (CAASPP) results (California Assessment of Student Performance and Progress, 2024). FRPM enrollment is widely adopted in education research as an indicator of school-level poverty concentration, serving as the primary measure of student economic disadvantage available in K-12 administrative data (Domina et al., 2018). The merged dataset includes 6,859 schools with complete poverty and achievement data, which is sufficient for reliable testing.

Schools were categorized into four poverty levels based on the percentage of pupils qualified for free or reduced-price meal: Low-poverty (≤25% FRPM Enrollment Rate), Mid-low poverty (25.1-50%), Mid-high poverty (50.1-75%), and High-poverty (>75%). The achievement measures were gauged with CAASPP scale scores in ELA and Mathematics, weighted with the number of pupils assessed to give representative school-level means.

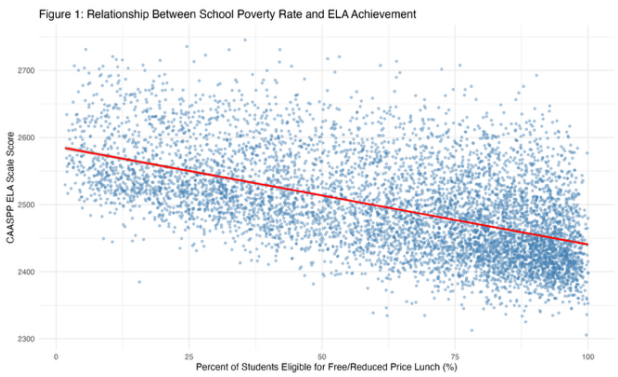
Key Findings

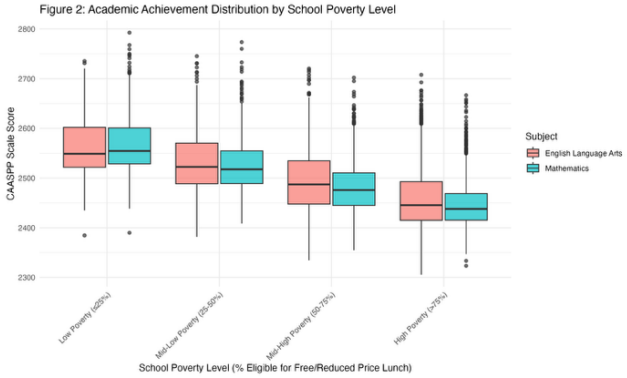
Subject	Overall[1]	Low Poverty (≤25%) N = 885[1]	Mid-Low Poverty (25-50%) N = 1,307[1]	Mid-High Poverty (50-75%) N = 1,649[1]	High Poverty (>75%) N = 3,018[1]	p-value[2]
ELA Score	2,494.6 (71.1)	2,562.7 (56.3)	2,532.1 (59.0)	2,494.9 (63.9)	2,458.2 (59.5)	<0.001
Math Score	2,484.6 (64.8)	2,567.5 (55.5)	2,524.6 (51.2)	2,480.5 (50.1)	2,445.3 (43.4)	<0.001

[1] N = Number of schools; Data presented as Mean (Standard Deviation)

[2] One-way analysis of means (not assuming equal variances)

Behind the statistics for California schools is a disturbing reality affecting millions of students every day. Table 1 reveals the systematic character of inequality in schools: high-poverty students (>75% FRPL Enrollment Rate) achieve 104 points lower on the ELA test, and 122 points lower on the Mathematics test, than students from low-poverty schools (⩽25% FRPL Enrollment Rate). These significant differences ($p < 0.001$) are large: low-poverty schools significantly surpass the statewide averages (2,562.7 vs. 2,494.6 on the ELA test; 2,567.5 vs. 2,484.6 on the Math test), whereas high-poverty schools significantly underperform statewide averages (2,458.2 vs. 2,494.6 on the ELA test; 2,445.3 vs. 2,484.6 on the Math test). California's modest statewide averages of 2,495 points on the ELA test and 2,485 points on the Mathematics test obscure these stark differences.





The extent of this inequality runs far deeper than individual instances of deep poverty. Figure 1 betrays the poverty-achievement relationship as a continuous, linear line by plotting individual schools over the full range of economic diversity. Each of the points on this scatter plot represents an actual school community, and collectively, they create a clear downward trend that functions predictably across the full range of poverty levels. Schools with 30% low-income students differ measurably from those with 60%, for instance, which differ from those with 80%. This linear relationship demonstrates that the poverty-achievement connection affects schools throughout California's educational landscape, not just those at the extremes.

A particularly concerning pattern emerges when examining how different academic subjects respond to school poverty conditions. Mathematics appears especially vulnerable to the challenges that high-poverty schools face. Figure 2 provides compelling visual evidence of this differential impact through side-by-side comparisons across poverty categories. While both subjects show declining performance as poverty increases, Mathematics exhibits more pronounced changes in score distributions. In high-poverty schools, the Mathematics boxes become notably compressed compared to ELA, suggesting that poverty constrains not only average mathematical achievement but also limits the full range of what students can accomplish.

Conclusion

This analysis documents systematic educational inequities across California's public schools, with achievement gaps of 104 points in ELA and 122 points in Mathematics between

high- and low-poverty schools. The linear relationship between school poverty rates and academic performance affects nearly 2 million students in high-poverty schools, with Mathematics showing greater sensitivity to socioeconomic disadvantage than English Language Arts.

These results indicate two near-term policy priorities: comprehensive resource investments for high-poverty schools with increased funding, smaller class sizes, and wraparound services, and targeted Mathematics interventions with special coaching, extended time for learning, and better instructional materials. The Mathematics gap is specifically alarming, given the mathematical competency being the portal to STEM fields and college readiness, both routes targeted by concentrated school poverty's systemic undermining.

These gaps recorded herein signify more than statistical disparities. They signify students deprived of opportunities. In one of the richest states of America, no student deserves to be so heavily disadvantaged academically because they go to schools with high poverty concentrations. California has both the resources and the responsibility to change this reality. What remains is the commitment to act.

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