Claudia Yang

Fay Yan

Kevin Xie

Yizhou Zhou

Professor Palermo

ENGRD 302W

7 November 2024

Research Proposal

Research Question:*How do regional and demographic factors contribute to disparities and inequalities in educational outcomes?*

**Introduction**

Educational inequalities continue to persist across the United States, driven by complex interactions between regional and demographic factors. These disparities manifest through differences in funding, access to resources, and family backgrounds, ultimately affecting students' academic performance and future opportunities. Our research seeks to investigate how regional and demographic factors, such as poverty, geographic location, and school funding, contribute to disparities in educational outcomes. By focusing on both SAT scores and GPA as measures of academic performance, we aim to paint a more holistic picture of how these factors shape the educational landscape, providing valuable insights for policymakers and educators aiming to reduce these inequities. Additionally, our data enables us to investigate trends in educational performance relative to the U.S. economy (GDP), examining their correlations and similarities over time. By identifying these patterns, we aim to provide insights that could guide strategic educational investments for long-term economic benefits.

**Literature Review**

Educational disparities rooted in racial and socioeconomic divides continue to influence academic outcomes across regions, as shown by Orfield et al. in *School Segregation By Race, Poverty and State*. The authors suggest that academic outcomes are closely tied to both poverty and geographic location, as minority students in high-poverty regions are frequently segregated into under-resourced schools, limiting their academic opportunities and widening performance gaps(Orfield et al.). In her book *When Money Matters*, Wenglinsky complements this by showing that educational spending—particularly on instructional resources—directly impacts student achievement in areas like mathematics. This spending disparity is often linked to family income, with wealthier students more likely to attend schools that can invest in resources that enhance academic performance, whereas students in low-income areas typically lack access to such funding (Wenglinsky).

The study by Chew, Satpathy, and Wong (2020) examined how geographic and socioeconomic factors shape academic outcomes in California’s K-12 education. Using Geographic Information Systems (GIS), the researchers identified family structure, healthcare spending, and proximity to educational resources as critical influences on SAT performance. Students from two-parent households and those with higher health insurance spending tend to perform better on the SAT, as do those surrounded by educational businesses. In contrast, students from diverse, larger, and multigenerational households generally score lower. The study noted limitations of using SAT scores alone to assess academic performance, highlighting that standardized tests may not fully capture broader educational outcomes. Additionally, a study by Zwick shows that inequities in educational opportunities makes it difficult to isolate academic achievement from family income, as home environments often reflect economic status. Students from wealthier families are more likely to come from achievement-oriented homes, which reinforces academic advantages (Zwick). Despite efforts to de-emphasize test scores in college admissions, such measures may have limited impact on diversifying student bodies, given that test scores, grades, and course completion patterns are all influenced by socioeconomic factors. This underscores the challenge of achieving educational equity when academic metrics are so closely tied to family background.

Additionally, Hanushek, Ruhose, and Woessmann’s work links economic growth to education quality, demonstrating that states with higher student achievement experience greater increases in GDP. This suggests that improving education, particularly in math and cognitive skills, can have long-term economic benefits, further highlighting the importance of addressing disparities in educational opportunities (Hanushek), which implies that disparities in education quality can have significant long-term economic implications.

Building on these previous findings, our study aims to investigate how poverty, regional characteristics, and funding disparities intersect to drive educational inequalities across demographic groups. Also, we consider GPA along with SAT scores as indicators for academic performance, seeking a more comprehensive view to better understand the impacts of socioeconomic and geographic factors on student achievement. Through this study, we hope to offer insights that could guide targeted interventions for addressing and reducing educational disparities.

**Method**

To answer our research question, we will conduct a quantitative analysis using data on academic performance (Bart) alongside demographic and regional factors from our dataset. Specifically, we will use linear regression models to examine the relationship between socioeconomic variables, such as family income and regional funding levels, and academic outcomes. Additionally, logistic regression will be used to analyze categorical outcomes, such as the likelihood of achieving a certain GPA threshold based on regional and demographic factors.

We also plan to visualize spatial patterns in educational disparities, building on the previous work of Chew, Satpathy, and Wong, who used GIS as a primary method. We will continue improving the visualization to provide a better and more reader-friendly representation of our findings for our target audience. Our methods will be iterative, as we refine our approach based on preliminary findings and insights provided by existing literature. This mixed-methods approach will help us draw more nuanced conclusions regarding how regional and demographic factors contribute to educational disparities.

Work Cited

Bart, Austin Cory. “School Scores CSV File.” *CORGIS Datasets Project*, 24 Oct. 2016, corgis-edu.github.io/corgis/csv/school\_scores/. Accessed 21 Oct. 2024.

Chew, Briana, et al. “Geospatial Analysis: A New Window into Educational ...” *Taylor & Francis*, 19 Dec. 2018, journals.sagepub.com/doi/10.3102/0091732X20907362. Accessed 05 Nov. 2024.

Eric A. Hanushek, Jens Ruhose. “It Pays to Improve School Quality.” *Education Next*, 3 Mar. 2022, pp. 16-24, www.educationnext.org/pays-improve-school-quality-student-achievement-economic-gain/.

Orfield, Gary, et al. “Brown at 62: School Segregation by Race, Poverty and State.” *eScholarship, University of California*, 1 Nov. 2016, escholarship.org/uc/item/5ds6k0rd. Accessed 04 Nov. 2024.

Wenglinsky, Harold. “When Money Matters: How Educational Expenditures Improve Student Performance and How They Don’t. A Policy Information Perspective.” *ERIC*, Policy Information Center, Mail Stop 04-R, Educational Testing Service, Rosedale Road, Princeton, NJ 08541-0001; Internet: Http://Www.Ets.Org ($9.50)., 31 Mar. 1997, eric.ed.gov/?id=ED412271. Accessed 04 Nov. 2024.

Zwick, Rebecca. “Is the SAT a ‘Wealth Test’?” *Phi Delta Kappan*, vol. 84, no. 4, Dec. 2002, pp. 307–311, doi:10.1177/003172170208400411.