

Research Question

To what extent does a critical mass of non-white teachers present at a high school impact the college retention rates of graduates from that high school?

Data

Data Sources:

- **School-Level Data**
 - Chicago Public Schools Data Portal
 - Demographics (Race, Income, ELL, SPED, etc.)
- National Student Clearinghouse
- College Retention & Persistence
- **Individual-Level Data**
 - Employee Position Files

Background

Critical Mass

- Racial diversity above a particular threshold (e.g. 35%) is required to enhance performance.

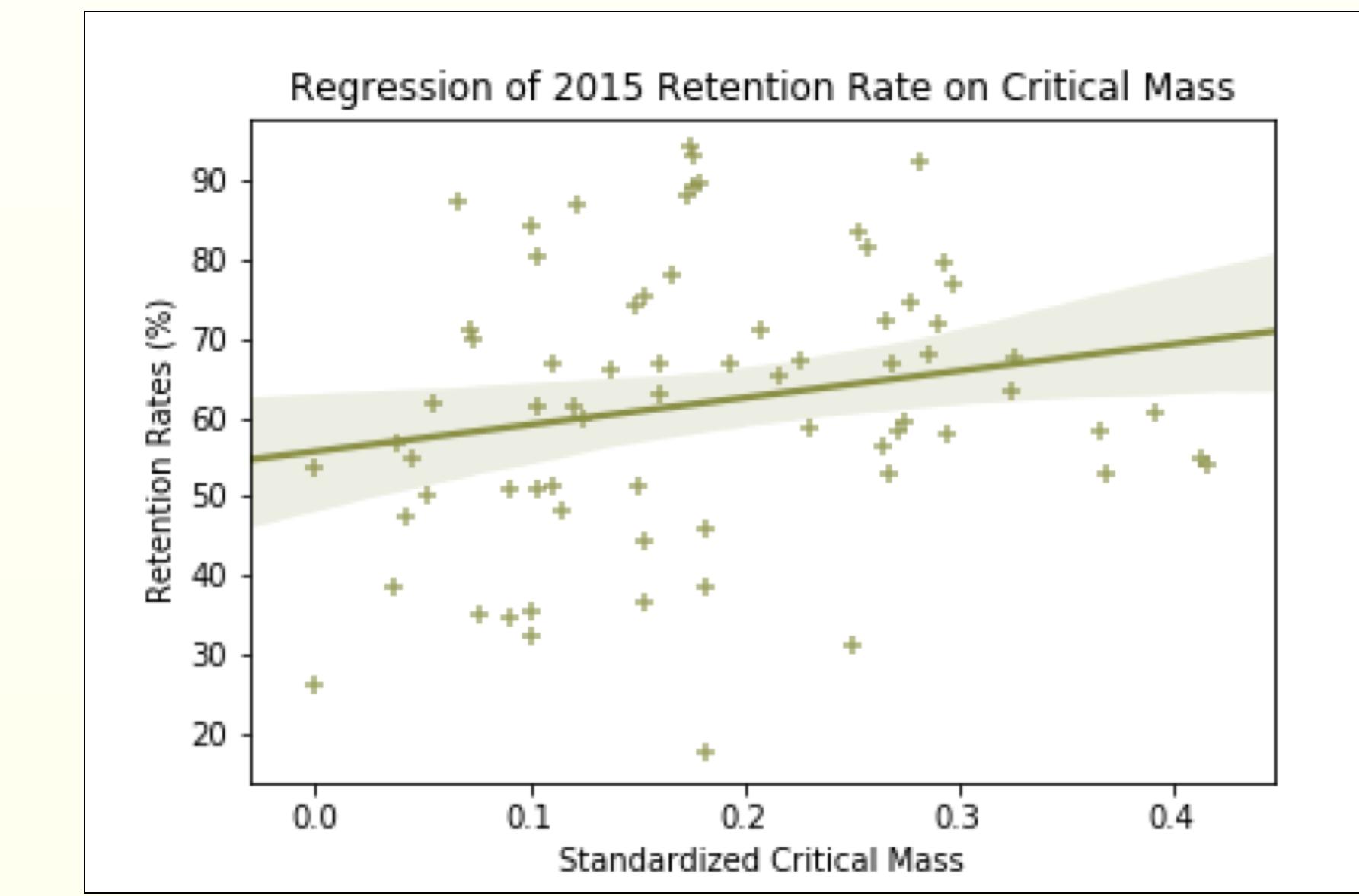
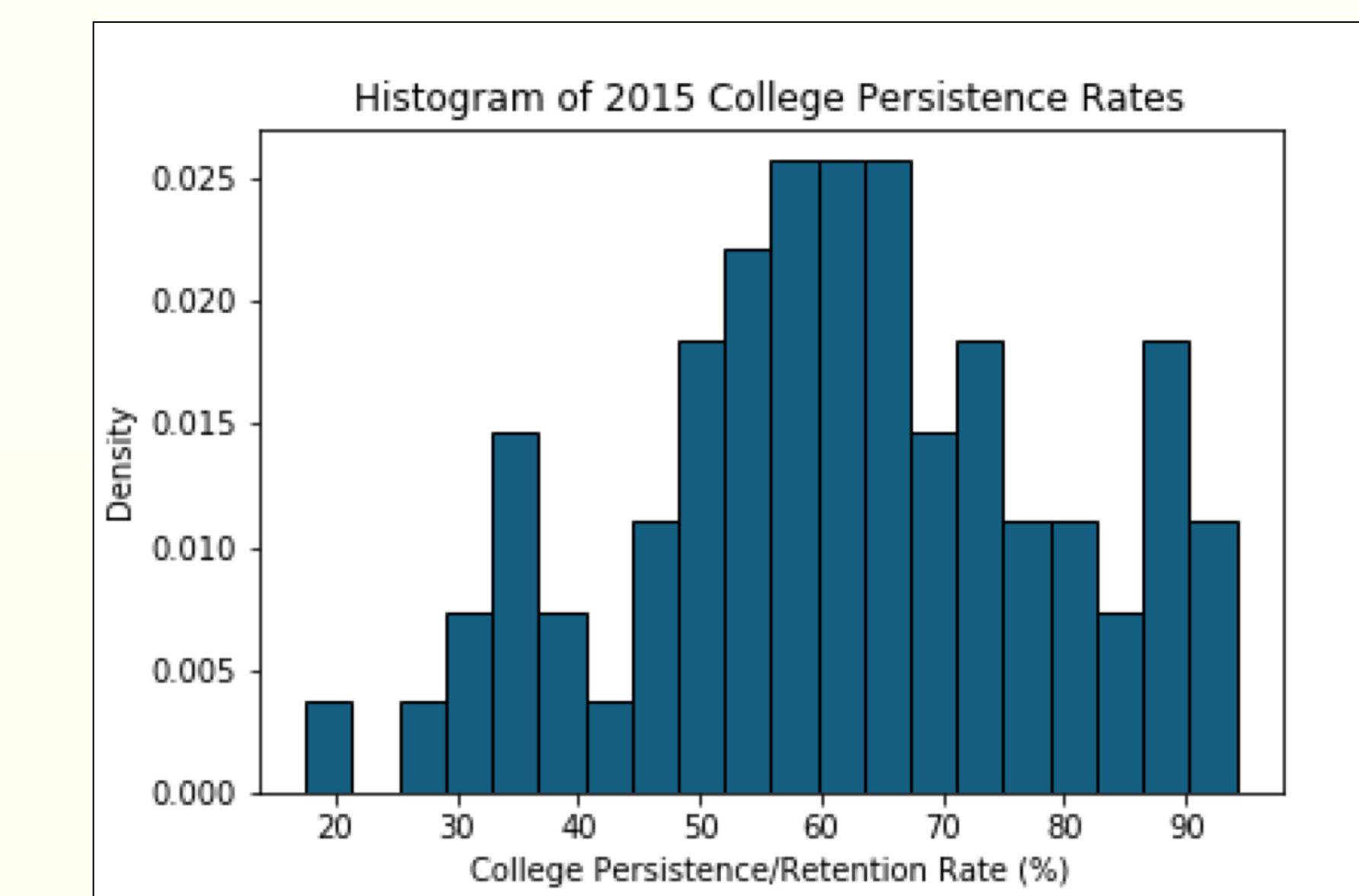
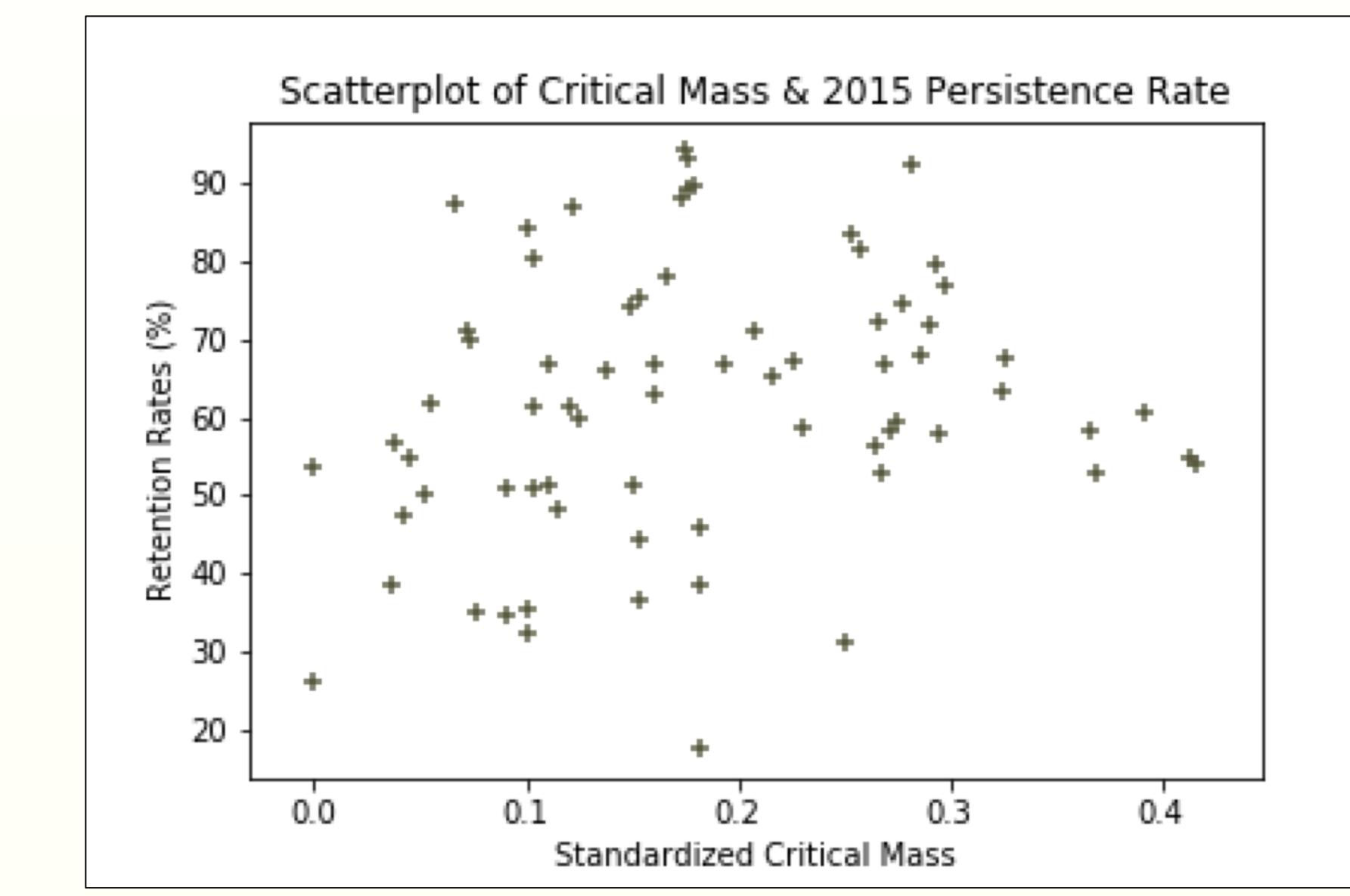
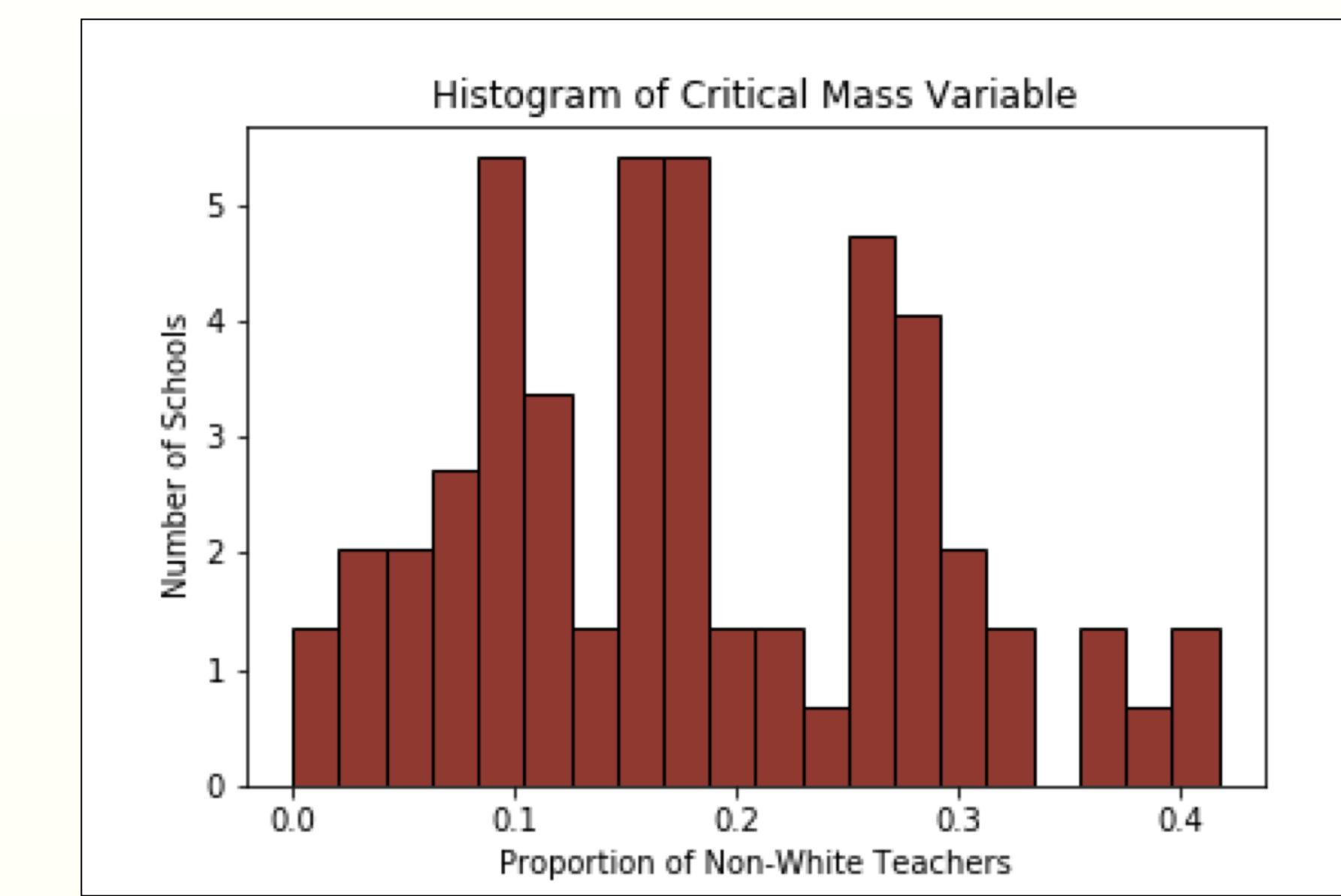
Representative Bureaucracy

- Institutional bureaucracies – i.e. public schools – should be demographically representative of the constituents – i.e. students – they serve.

Model

College_Retention

$$\begin{aligned} \text{College_Retention} = & \beta_0 + \beta_1 \text{CriticalMass} + \beta_2 \text{ELL} + \beta_3 \text{SPED} + \beta_4 \text{FreeLunch} + \beta_5 \text{White} + \beta_6 \text{Black} \\ & + \beta_7 \text{NativeAmericanAlaskan} + \beta_8 \text{Hispanic} + \beta_9 \text{MultiRace} + \beta_{10} \text{Asian} + \beta_{11} \text{HIFI} + \epsilon \end{aligned}$$



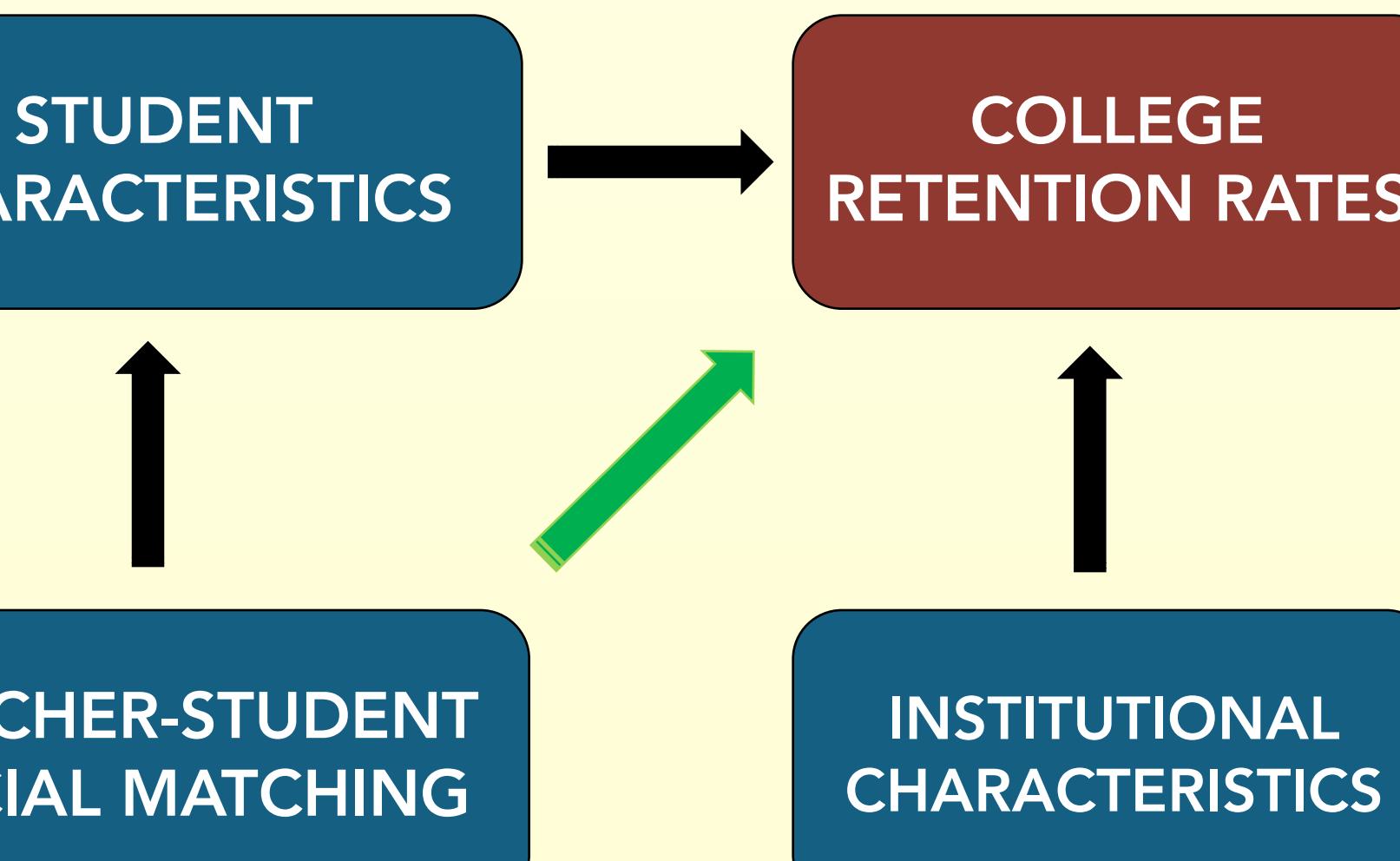
Results & Conclusion

Initial Hypotheses:

- Non-linear relationship between critical mass and retention rates
- Spline at *critical mass* = 0.35 – should see increase in retention rates

Conclusions:

- Coefficient on critical mass is negative
- No clear critical mass effect

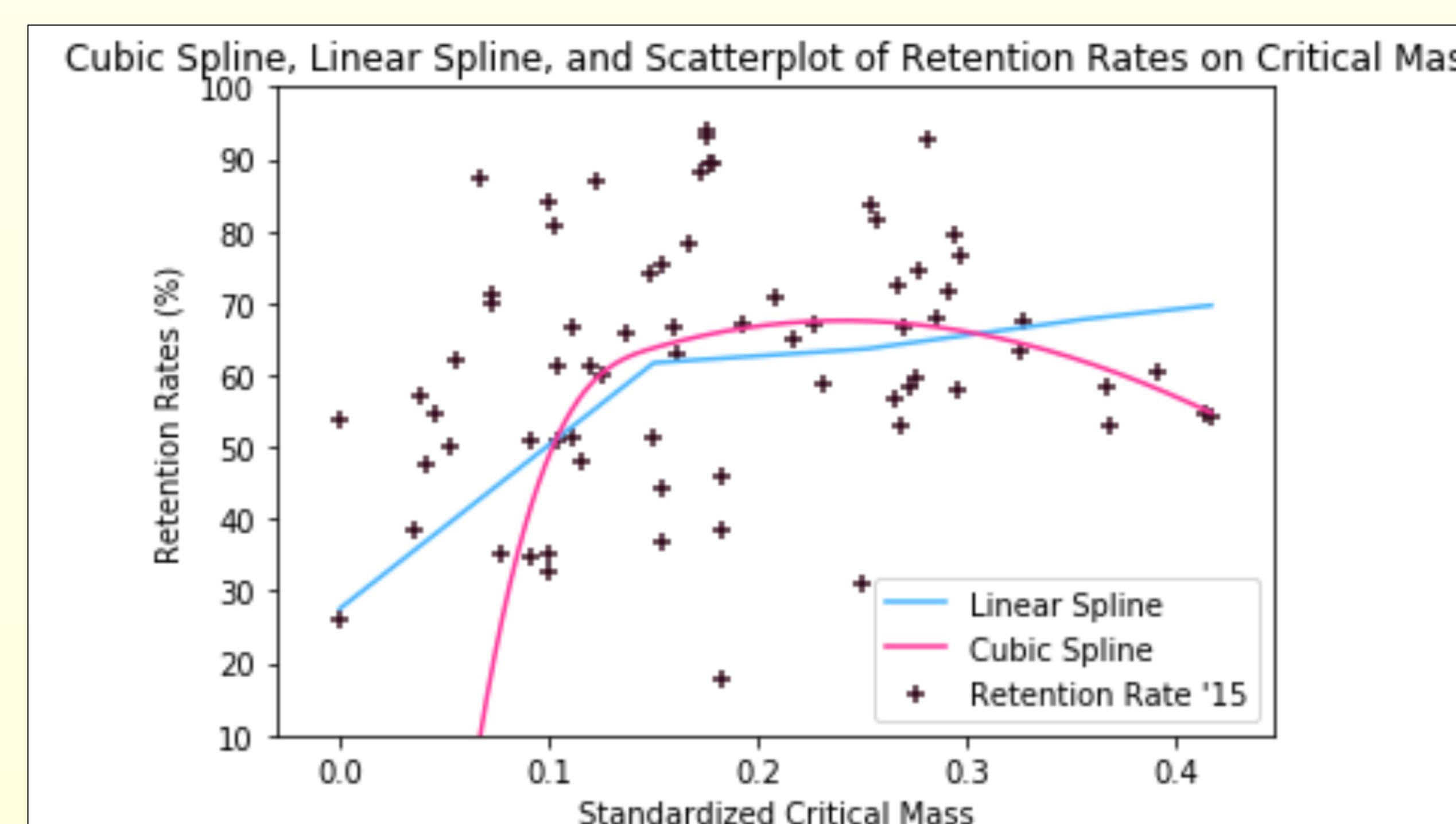


Methods

Calculating Critical Mass:

- *ethncolr* package
 - Ensemble Method to predict race of individual:
 - 2010 U.S. Census
 - Wikipedia
 - Florida Voter Registration Files

Linear & Cubic Spline



OLS Regression

| Variable | Est. | St.Err. | P-Value |
|------------------|---------|----------|---------|
| Intercept | 70.1730 | 2902.180 | 0.981 |
| Critical Mass | -19.522 | 22.049 | 0.380 |
| White | 0.7278 | 29.005 | 0.980 |
| Black | 0.6698 | 29.021 | 0.982 |
| Native A/Alask | 0.1416 | 29.549 | 0.996 |
| Hispanic | 0.8030 | 29.019 | 0.998 |
| Multi-racial | -3.8293 | 29.569 | 0.897 |
| Asian | 1.2574 | 28.972 | 0.966 |
| Hawaiian/P.Islan | -1.1538 | 30.553 | 0.970 |
| Unknown | -0.5121 | 29.497 | 0.986 |
| ELL | 0.1835 | 0.590 | 0.757 |
| SPED | -63.539 | 19.516 | 0.002 |
| Free Lunch | -72.695 | 26.834 | 0.009 |

Limitations

- Data Granularity
- Imputation of Teacher race
- Time-Invariant Demographic Controls

References

- Grissom, Jason & Kern, Emily & Rodriguez, Luis. (2015). The "Representative Bureaucracy" in Education: Educator Workforce Diversity, Policy Outputs, and Outcomes for Disadvantaged Students. *Educational Researcher*. 44. 185-192. 10.3102/0013189X15580102.
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- Meier, Kenneth J., and Joseph Stewart. "The Impact of Representative Bureaucracies: Educational Systems and Public Policies." *The American Review of Public Administration*, vol. 22, no. 3, 1992, pp. 157-171., doi:10.1177/027507409202200301.