Redistricting School Zones in Durham County

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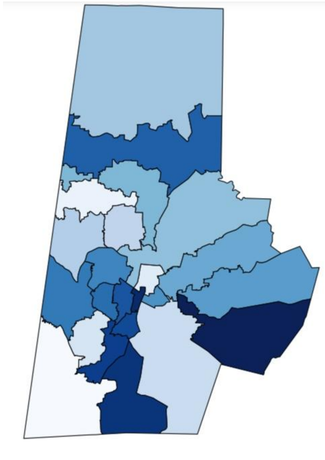
History of Segregation in Durham County

- Racial segregation discrimination is not eradicated
- 1970: Legal desegregation triggers white flight
- 1992: Durham merges functionally segregated districts
- 2007: More charter schools, Increased segregation
- Present: Durham on the verge of rezoning schools

How do we equitably draw new school zones?

Principles in Rezoning

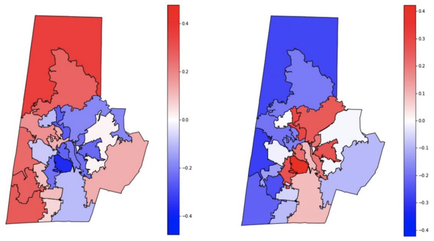
- We aimed to generate school districts that are equitable and reflective of the population of Durham County.
- The generated districts were evaluated based on the following criteria:
  - Socioeconomic Status
  - Race
  - Walkability (how friendly the school is to walking)
  - Maintaining one school per district
- The motivation for this project is that Durham County will be redistricting this fall which will create the plans for the next 10 years.
- Redistricting won't prevent white flight, but could set the stage for integrated community schools that serve the entire community



- Durham County schools
  - 4 county districts
  - 54 public schools
  - 23 elementary school zones
- Our project focuses on the redistricting of the county's 23 main elementary schools to find plans with the highest levels of integration
- The image to the right shows Durham county's 23 current elementary school zones, with which we worked to manipulate in this project

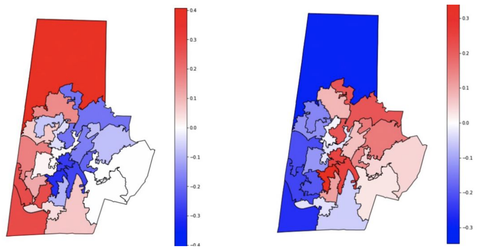
Comparing Plans by Racial Distribution

Least Segregated School Zones



White Black

Most Segregated School Zones



White Black

- We generated 2000 random plans
- Off these plans we found the most and least segregated plans
- Integration/segregation is measured via r-values (correlation coefficients) of how the schools in each plan reflects Durham county.
- In each district the deviation from Durham's racial distribution is measured
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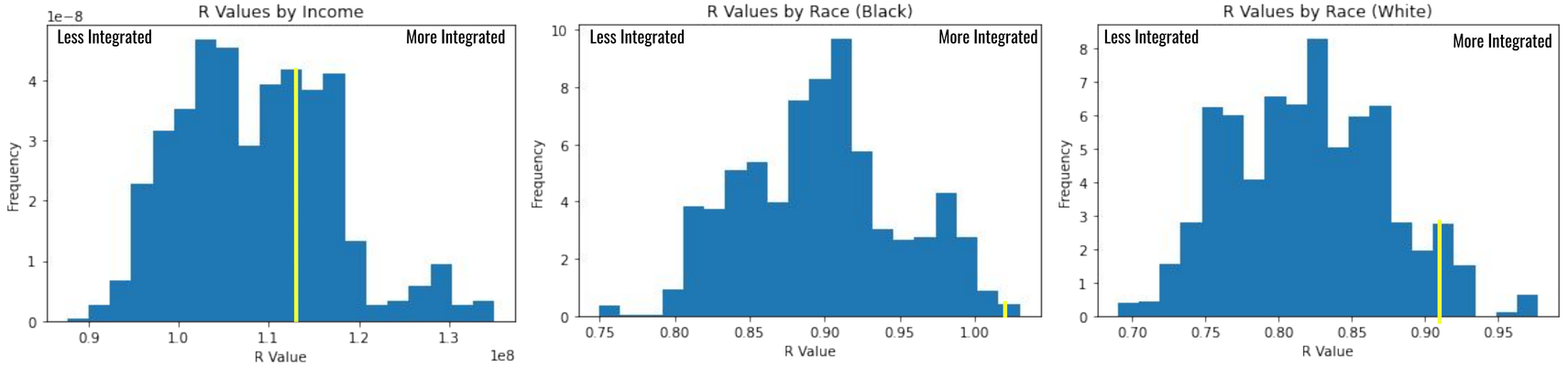
$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Statistical Analysis by Income and Race



The histograms above show the distribution of calculated correlation coefficients for 2000 randomly generated redistricting plans. Plans with higher r-values have districts where the districts' average racial composition or income is closer to that of the county, therefore, demonstrating more integration across the districts in that plan. The yellow lines represent the current Durham county school district plan (1.101, 1.033, 0.908). Although these r-values may appear to be at or above average in comparison to the rest of the distribution, this does not take into account children attending private or charter schools, which account for a large population of white children in predominantly black areas.

Conclusion

Redistricting will not solve all of our problems:
- Creating integrated districts requires community buy-in
- Even completely integrated districts can be proven ineffective due to white flight, or the mass attendance of charter of private schools

However, we believe redistricting can lay the groundwork to create a more equitable system.
- For example, community driven recruiting towards public schools could lead toward integrated schools, as long as the districts allow for it.

Acknowledgements and References

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