The Dynamics of Migration, Segregation, and Opportunity
Sammy Gold

Background

There are a handful of policies within the United States that attempt to reduce racial and income inequality gaps: school choice, higher education, housing vouchers, SNAP, and re-skilling, to name a few. Despite many efforts to narrow inequality gaps via policy, many gaps in key outcomes continue to persist today. These gaps start early in life and continue to persist into adulthood: racial disparities in reading and math skills emerge as early as Kindergarten (Reardon et al. 2016), continue in higher education (NCES 2020), which further exacerbate disparities in family wealth gaps with the median white family accruing $184,000 compared to $23,000 for the median Black family (Hernández-Kent 2020). These gaps continue with health disparities: as the Treasury reports "Black and Hispanic Americans face higher rates of child abuse, lead exposure, obesity in childhood, and chronic illness in adulthood than white Americans" (Harris 2022).

There is a large literature showing that these differences across racial groups are largely rooted in place (i.e. where a person grows up). Within this place literature, researchers have linked racial disparities to place by quantifying the benefits of moving away from high poverty neighborhoods to low poverty neighborhoods (Ludwig et. al 2013; Chyn 2018; Chyn et al. 2021). The Moving to Opportunity experiment showed that children who moved away from high-poverty neighborhoods to low-poverty neighborhoods had higher college attendance, higher earnings, and lower single-parent rates with positive effects being largest for children who had the longest exposure to a low-poverty neighborhood (Chetty et al. 2016). Additional follow-up research has also shown how upward mobility varies across granular geographies: in the United States two nearby neighborhoods can have very different rates of upward mobility. (Chetty et al. 2013) In sum, place matters a lot when it comes to narrowing socioeconomic and opportunity gaps.

Despite the documented benefits of moving away from low poverty areas, new research has shown that 80% of young adults (age 26) tend to stay within a 100-mile radius of where they grew up at age 16. This "radius of opportunity" is even narrower for Black adults: Black adults move an average of 60 miles less than White young adults (Sprung-Keyser et al. 2022). Given the persistence of Black-White segregation in America over time (Logan et al. 2021), this narrowing of the "radius of opportunity" for Black adults is particularly concerning especially if narrowing racial and income disparities in later-in-life outcomes is a primary policy goal.Why? Because segregation has been shown to be an especially important aspect of neighborhoods (Chyn et al. 2022). Additionally, segregation has been shown to contribute to increased poverty (Ananat 2007), adverse educational outcomes (Card et al. 2007), and reduced intergenerational mobility (Chetty et al. 2020).

Current Study

This extended abstract builds on the large "place" literature summarized briefly above to further examine the dynamic between migration patterns, segregation, and opportunity in the United States. Joining population estimates from the Decennial Census with novel commuting-zone level data from two Opportunity Insights projects provides the opportunity to examine the following questions:

- Is there evidence of higher outflows in areas with high segregation? Is there evidence of higher inflows in areas with low segregation?
- How do different levels of segregation and opportunity within a commuting zone affect movement away from an area?
- Are there any commuting zones in particular that show promise in narrowing key inequality gaps?

Relevance/Broader Impact

Understanding the dynamics between migration patterns, segregation, and opportunity provides the chance to identify promising migration flows that have the potential to reverse early childhood place effects and consequently narrow pre-existing inequality gaps. Research currently shows that place matters most in early childhood, but does place have the power to change trajectories in young adulthood? Additionally, the questions above provide the opportunity to expand on the existing documentation of differential migration patterns by looking at it from the perspective of segregation and opportunity. To what degree does segregation impact migration patterns?

Data

To answer the questions above, this study links four key sources of data at the commuting zone level: migration patterns of young adults, measures of segregation, measures of opportunity, and lastly college mobility report card data. All data used for this project is public-use with a large portion of the data coming from the nonpartisan policy research lab Opportunity Insights.

Migration Patterns

Using migration data from Keyser-Sprung (2022), I am able to track commuting zone to commuting zone movement between childhood and young adulthood for individuals born in 1984-1992. Keyser-Sprung et al. assemble a commuting zone to commuting zone matrix by combining Census, tax, HUD, and ACS data to record an individual's location at age 16 and age 26. For each commuting zone to commuting zone pair, I am able to observe the total number of individuals who moved away from an origin commuting zone location to a given destination location and am able to break down these "flows" within a commuting zone to commuting zone pairing by race and income. The publicly available dataset contains 549,081 observations (741 origin commuting zones x 741 destination commuting zones) and thus contains all possible origin commuting zone and destination commuting zone pairs within the United States. I choose to focus on studying the flows of young black Americans as opposed to all flows pooled together following Chetty et al. (2020) who find that black Americans have the lowest access to opportunity.

Measures of Opportunity

To quantify opportunity within a given origin or destination commuting zone, I rely on measures of opportunity from Chetty et al. (2014). In Chetty et al. (2014), opportunity is measured as the mean child household income rank in a given commuting zone for a child with parents at the 25th percentile rank of the national distribution.

Measures of Segregation

Following Reardon et al. (2004), segregation is measured using the black-white dissimilarity index. More precisely, the dissimilarity index is calculated as follows:

$$\frac{1}{2}\sum_{i=1}^{N}\left|\frac{a_i}{A} - \frac{b_i}{B}\right|$$

where a_i represents the population of white individuals in the geographic subunit i (census tract), A represents the total population of white individuals in the spatial unit of analysis (commuting zone), b_i represents the total population of black individuals within a given census tract, and B represents the total population of black individuals in a given commuting zone. In other words, the black-white dissimilarity index measures the degree of racial segregation of neighborhoods (tracts) within all 741 commuting zones in the United States.

Population data from the 2000 Decennial census was used to estimate the equation above for all origin commuting zones since the youngest birth cohort in the migration pattern data is 1984 (these individuals would be approximately 16 years old in the year 2000). Population data from the 2010 Decennial census was used to estimate the equation above for all destination commuting zones since the youngest birth cohort in the migration pattern data would be approximately 26 years old in 2010. County-level population estimates were aggregated up to the commuting zone level and joined via a county to commuting zone crosswalk since population data was not available at the commuting-zone level.

Location and Characteristics of Post-secondary Institutions

As a preliminary attempt to dig deeper into potential reasons for movement away from a given origin commuting zone at age 26, Appendix Figure 1 maps outflows across all 741 commuting zones while overlaying the location of all accredited post-secondary institutions. Data from the Department of Education's college scorecard is linked to data from Opportunity Insight's mobility report cards (Chetty et al. 2020). These two data sources provide the location of accredited post-secondary institutions as well as an "upward mobility score" that allows for the differentiation of high value-add schools and low value-add schools within a given commuting zone. In general, there does not appear to be any correlation between outflows and proximity to high mobility institutions.

Descriptive Results

Characterizing Migration Patterns of Young Black Adults The migration pattern data captures the behavior of 4,475,814 young black adults in the United States. Of those 4,475,814 individuals, 74.2% are observed living in the same commuting zone that they lived in at age 16 at age 26 and 25.8% are observed living away from the commuting zone that they grew up in at age 16. Commuting zone locations are well distributed across both types of individuals (stayers and movers) - there aren't any commuting zones among movers and stayers that strictly dominate others. For example, the move from Los Angeles to Las Vegas is the most common flow observed among young black adults but this move only represents roughly 0.4% of all possible moves observed in the data. The commuting zones with the most stayers include New York (5% of all "within" commuting zone patterns observed), Chicago (4%), Atlanta (4%), Detroit (3%), and Philadelphia (3%). For the rest of the results, I focus solely on the 25.8% of individuals who moved away from their origin commuting zone.

Is there evidence of higher outflows in areas with high segregation? Is there evidence of higher inflows in areas with low segregation? Given that segregation has been shown to have a negative impact on later-in-life outcomes (Chyn et al. 2022), one question that warrants further investigation is whether or not individuals are able to move away from segregation. Figure 1 explores the relationship between segregation and *outflow* (movement out) migration among all 741 commuting zones within the United States. Each cell within Figure 1 is filled depending on the origin commuting zone's rate of outflow and segregation. Red cells indicate levels of segregation with darker red cells indicating more segregation. Blue cells indicate levels of outflow with darker blue cells indicating more outflows. Purple cells indicate high levels of outflow and high levels of segregation within a given commuting zone with darker shades of purple highlighting more intense levels of both outflows and segregation. From the lack of purple shading in Figure 1 as well as the dark red observed in various areas of the United States, we can see that young black individuals are not moving away from segregation at high rates. Figure 1 also underlines the high rates of segregation that exist within the Midwest, Northeast, and South.

Figure 2 explores the relationship between *inflow* (movement in) migration among all 741 commuting zones. Purple shades in this map have an alternative meaning: darker shades of purple highlight commuting zones with higher rates of inflows and higher rates of segregation. Blue cells indicate destination commuting zones with high rates of inflows and low levels of segregation and red cells indicate destination commuting zones with low rates of inflows and high levels of segregation. Despite a large number of cells (commuting zones) being red, there are some encouraging areas on the map that show young black individuals flowing into areas with low levels of segregation.

Combining the insights of Figure 1 and Figure 2, we can see that in general there is not a lot of movement away and into commuting zones in the Midwest, Northeast, and South. Additionally, we can see that these areas have some of the highest rates of segregation across all 741 commuting zones. Although more work is needed to understand the underlying mechanisms, this lack of movement within these areas could point to some potential frictions among young black individuals that limit their ability to move away from areas that may not benefit them in the long term.

How do different levels of segregation and opportunity within a commuting zone affect movement away from an area? The migration pattern data combined with opportunity and segregation metrics provides the opportunity to further explore the ways in which an individual's origin segregation or origin opportunity predict where they ultimately end up at age 26. How often do individuals who grow up in a low opportunity or high segregation area make it to a high opportunity or low segregation area? Figure 3 looks into the relationship between an individual's origin opportunity levels and the segregation levels of where they end up at age 26. Particularly, it looks at the number of individuals that flowed to different levels of opportunity from particular levels of segregation. Flows highlighted in blue indicate the flow with the highest number of individuals for a given origin category. For example, Figure 3 shows that individuals from a commuting zone with high levels of segregation are most likely to flow/migrate to destination commuting zones with low opportunity. In general, a majority of young black adults flow into low opportunity destination commuting zones regardless of the level of segregation observed in their origin commuting zone. However, this may be due to the fact that there are just more low opportunity commuting zones to migrate into (as indicated by the length of the "Destination Opportunity" bar). In

other words, options to migrate into high opportunity areas may be limited for black adults that move away from their origin commuting zone.

Figures 4 and 5 look at how segregation and opportunity change over time as individuals move from their origin commuting zone to their destination commuting zone. Figure 4 shows that an individual who grew up in a highly segregated area will always migrate into another highly segregated area. Further research is needed to understand why this may be the case, but this pattern could suggest that there are not enough destination commuting zones with lower segregation levels that black adults can feasibly move into in young adulthood. These patterns could also be hinting at an unfortunate cycle: people are unable to move away from segregation because of the high levels of segregation experienced in adolescence. Figure 5 shows a similar pattern with opportunity. In general, it appears as though access to better opportunities and lower segregation in early adulthood is limited. While limited, there are some promising flows observed with the migration patterns data. Table 1 lists the most common promising flows observed in the data broken down by type: high segregation → high opportunity and low opportunity → high opportunity. A promising future direction could involve looking into whether or not moving to these areas have any ability to narrow racial inequality gaps in young adulthood.

Conclusion
Taken all together, there seems to be some evidence suggesting that individuals who migrate away from their origin commuting zone are not escaping segregation or accessing more opportunity in young adulthood. Although more work is needed to fully understand the mechanisms at play here, this preliminary analysis seems to suggest that (a) there are frictions that make it difficult for individuals to move away from areas of high segregation to areas of high opportunity in young adulthood, (b) these frictions might be created by the segregation experienced in their origin commuting zone, and (c) areas that have potential to narrow racial inequality gaps later in life exist but are limited. To what degree does lack of access to higher opportunity in young adulthood further exacerbate inequalities that one may experience later in life? Additionally, if "place" is so powerful, can policymakers rely on it to reverse the negative effects of segregation? Answering the above questions may bring forth new policy levers that could help narrow the racial inequality gaps that persist in America.

References

Ananat, Elizabeth Oltmans. 2007. *The Wrong Side(s) of the Tracks Estimating the Causal Effects of Racial Segregation on City Outcomes*. w13343. Cambridge, MA: National Bureau of Economic Research. doi: 10.3386/w13343.

Baran, Cavit, Eric Chyn, and Bryan Stuart. 2023. *The Great Migration and Educational Opportunity*. w31012. Cambridge, MA: National Bureau of Economic Research. doi: 10.3386/w31012.

Bergman, Peter, Raj Chetty, Stefanie DeLuca, Nathaniel Hendren, Lawrence Katz, and Christopher Palmer. 2019. *Creating Moves to Opportunity: Experimental Evidence on Barriers to Neighborhood Choice*. w26164. Cambridge, MA: National Bureau of Economic Research. doi: 10.3386/w26164.

Card, David, and Jesse Rothstein. 2007. "Racial Segregation and the Black–White Test Score Gap." *Journal of Public Economics* 91(11–12):2158–84. doi: 10.1016/j.jpubeco.2007.03.006.

Chetty, Raj, John Friedman, Nathaniel Hendren, Maggie Jones, and Sonya Porter. 2018. *The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility*. w25147. Cambridge, MA: National Bureau of Economic Research. doi: 10.3386/w25147.

Chetty, Raj, John N. Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan. 2020. "Income Segregation and Intergenerational Mobility Across Colleges in the United States*." *The Quarterly Journal of Economics* 135(3):1567–1633. doi: 10.1093/qje/qjaa005.

Chetty, Raj, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. 2020. "Race and Economic Opportunity in the United States: An Intergenerational Perspective*." *The Quarterly Journal of Economics* 135(2):711–83. doi: 10.1093/qje/qjz042.

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106(4):855–902. doi: 10.1257/aer.20150572.

Chetty, Raj, Nathaniel Hendren, Patrick Kline, and Emmanuel Saez. 2014. "Where Is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States *." *The Quarterly Journal of Economics* 129(4):1553–1623. doi: 10.1093/qje/qju022.

Chyn, Eric. 2018. "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children." *American Economic Review* 108(10):3028–56. doi: 10.1257/aer.20161352.

Chyn, Eric, Kareem Haggag, and Bryan Stuart. 2022. *The Effects of Racial Segregation on Intergenerational Mobility: Evidence from Historical Railroad Placement*. w30563. Cambridge, MA: National Bureau of Economic Research. doi: [10.3386/w30563](10.3386/w30563).

Chyn, Eric, and Lawrence F. Katz. 2021. "Neighborhoods Matter: Assessing the Evidence for Place Effects." *Journal of Economic Perspectives* 35(4):197–222. doi: [10.1257/jep.35.4.197](10.1257/jep.35.4.197).

Harris, Benjamin. n.d. *Racial Inequality in the United States*. U.S. Department of the Treasury.

Kent, Ana Hernández, and Lowell R. Ricketts. 2020. "Has Wealth Inequality in America Changed over Time? Here Are Key Statistics." *Open Vault Blog*. Retrieved (https://www.stlouisfed.org/open-vault/2020/december/has-wealth-inequality-changed-over-time-key-statistics).

Logan, John R., and Stults, Brian J. 2021. *The Persistence of Segregation in the Metroplois: New Findings from the 2020 Census*.

Ludwig, Jens, Greg J. Duncan, Lisa A. Gennetian, Lawrence F. Katz, Ronald C. Kessler, Jeffrey R. Kling, and Lisa Sanbonmatsu. 2013. "Long-Term Neighborhood Effects on Low-Income Families: Evidence from Moving to Opportunity." *American Economic Review* 103(3):226–31. doi: [10.1257/aer.103.3.226](10.1257/aer.103.3.226).

National Center for Education Statistics (NCES). n.d. "Rate of High School Completion and Bachelor's Degree Attainment among Persons Age 25 and over, by Race/Ethnicity and Sex: Selected Years, 1910 through 2020."

Reardon, Sean F., and David O'Sullivan. 2004. "3. Measures of Spatial Segregation." *Sociological Methodology* 34(1):121–62. doi: [10.1111/j.0081-1750.2004.00150.x](10.1111/j.0081-1750.2004.00150.x).

Reardon, Sean F., and Ximena A. Portilla. 2016. "Recent Trends in Income, Racial, and Ethnic School Readiness Gaps at Kindergarten Entry." *AERA Open* 2(3):233285841665734. doi: [10.1177/2332858416657343](10.1177/2332858416657343).

Shertzer, Allison, and Randall P. Walsh. 2018. *The Origins of Urban Segregation in the United States*. The Reporter.

Sprung-Keyser, Ben, Nathaniel Hendren, and Sonya Porter. 2022. "The Radius of Economic Opportunity: Evidence from Migration and Local Labor Markets."
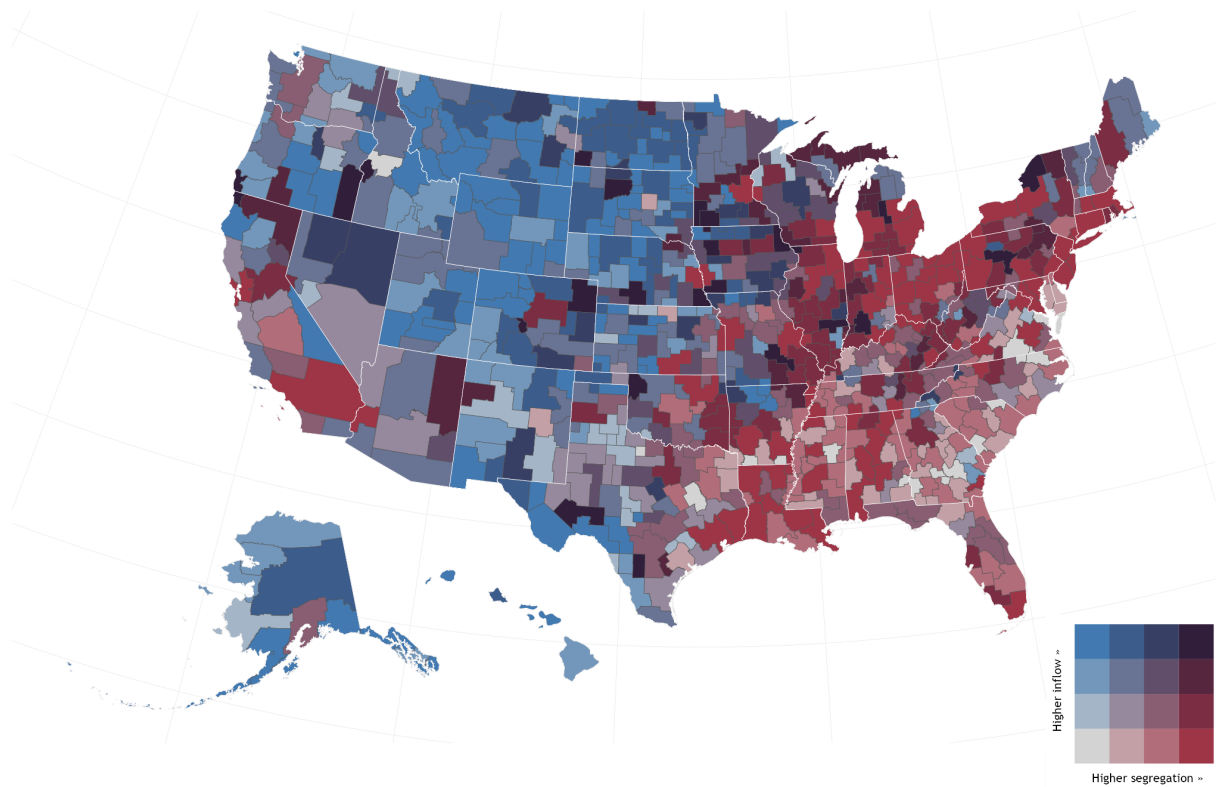
Figure 1: Segregation and Outflow Migration Among Young Adults in the US
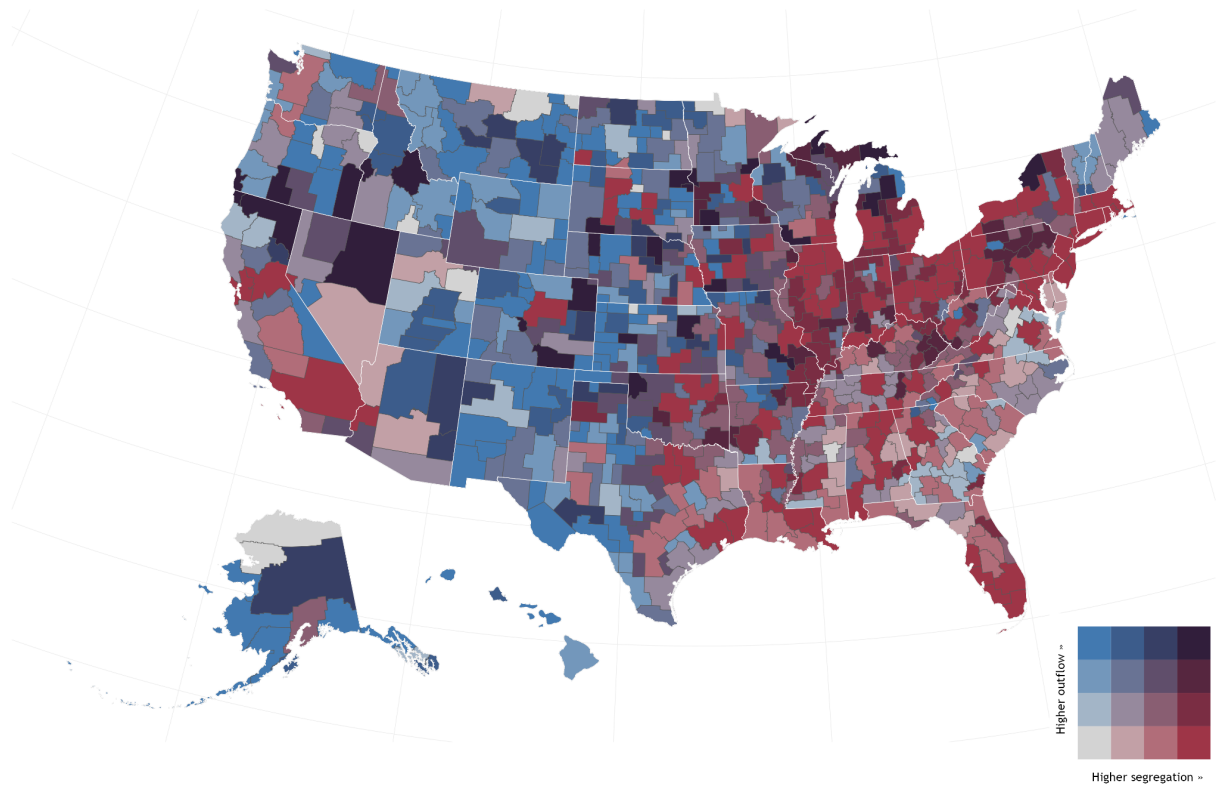
Notes: Percent of outflows represented as the number of people moving out of a given commuting zone divided by the number of people who live in the commuting zone. Percent of outflows calculated using migration data from Opportunity Insights. Note that the migration patterns are restricted to adults younger than 26. The black-white dissimilarity index was constructed using population estimates primarily from the 2000 Decennial Census and supplemented. Quantile breaks were used to determine the color ramp for both layers of data. Map projection used: USA Contiguous Albers Equal Area Conic. Commuting Zone shapefile from the Health Inequality Project.

**Figure 2: Segregation and Inflow Migration Among Young Adults in the US**

Notes: Percent of inflows represented as the number of people moving into a given commuting zone divided by the number of people who live in the commuting zone. Percent of inflows calculated using migration data from Opportunity Insights. Note that the migration patterns are restricted to adults younger than 26. The black-white dissimilarity index was constructed using population estimates from the 2010 Decennial. Quantile breaks were used to determine the color ramp for both layers of data. Map projection used: USA Contiguous Albers Equal Area Conic. Commuting Zone shapefile from the Health Inequality Project.

Figure 3: Flows by Origin Segregation and Destination Opportunity
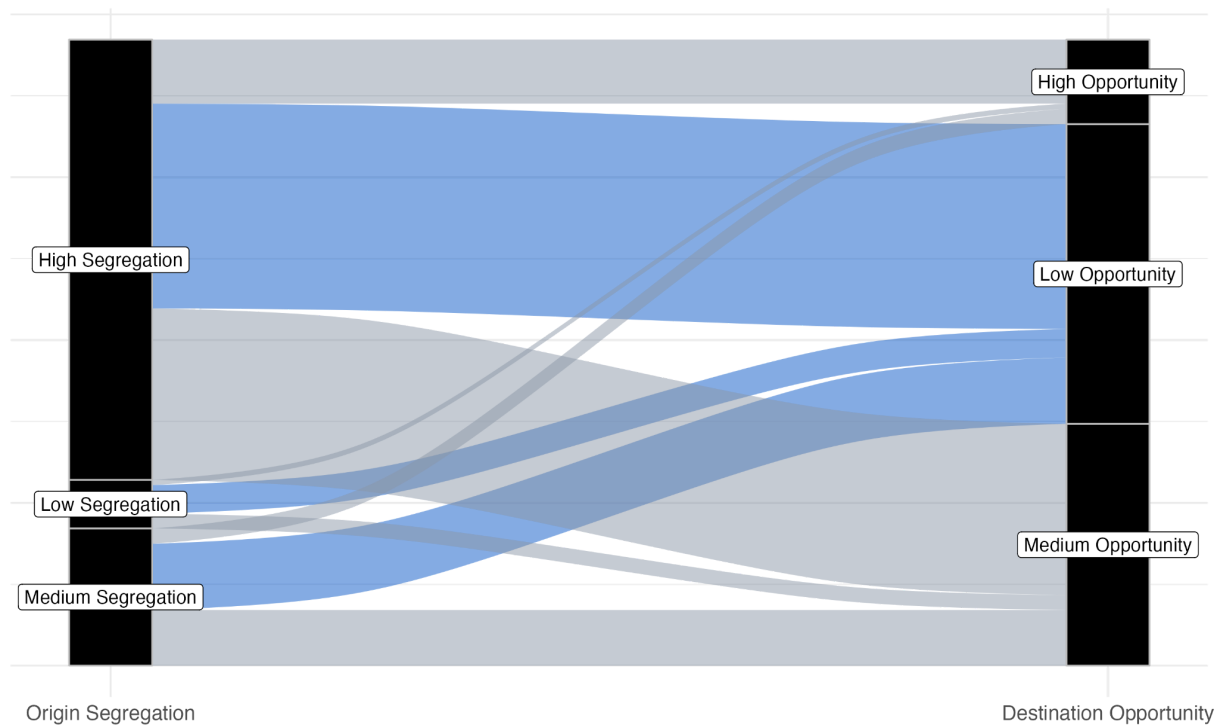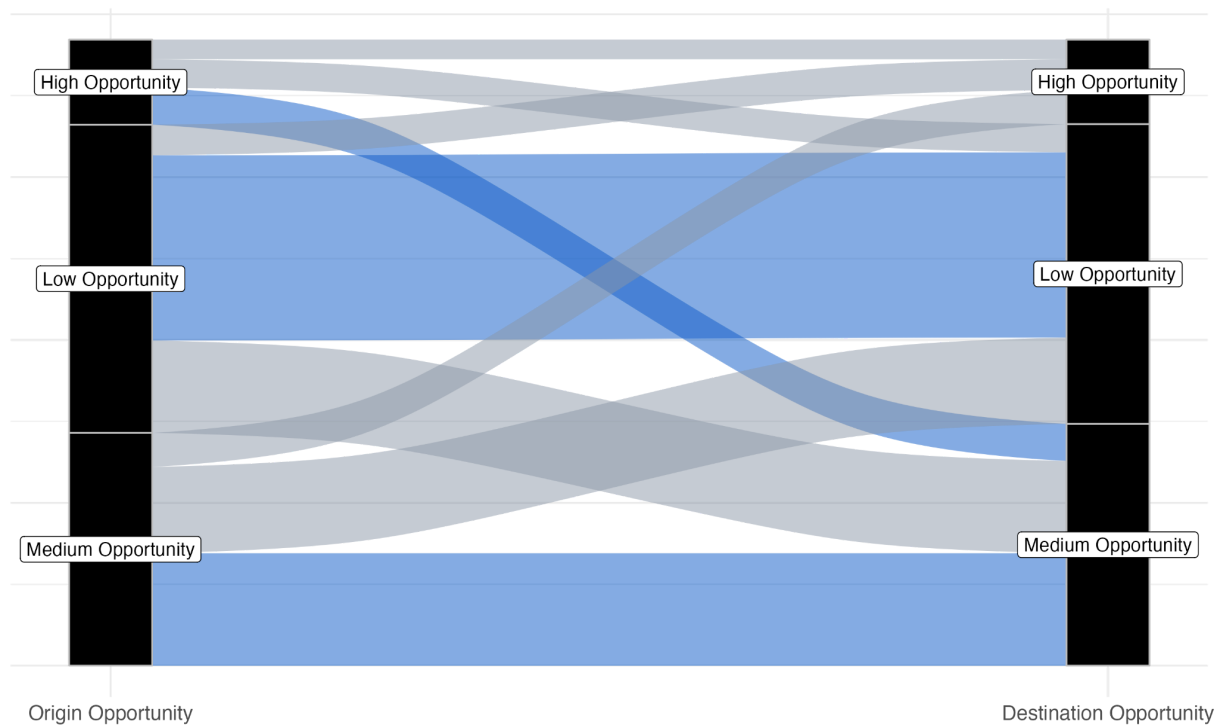

Notes: The flows highlighted in blue indicate the top flow between a given origin segregation category and a destination opportunity category. The width of each flow represents the count of flows for each origin segregation and destination opportunity pairing. The larger the width, the larger the flow. The vertical height of each bar (origin segregation or destination opportunity) indicates counts of individuals in a given origin or destination category.

Table 4: Flows by Origin Segregation and Destination Segregation
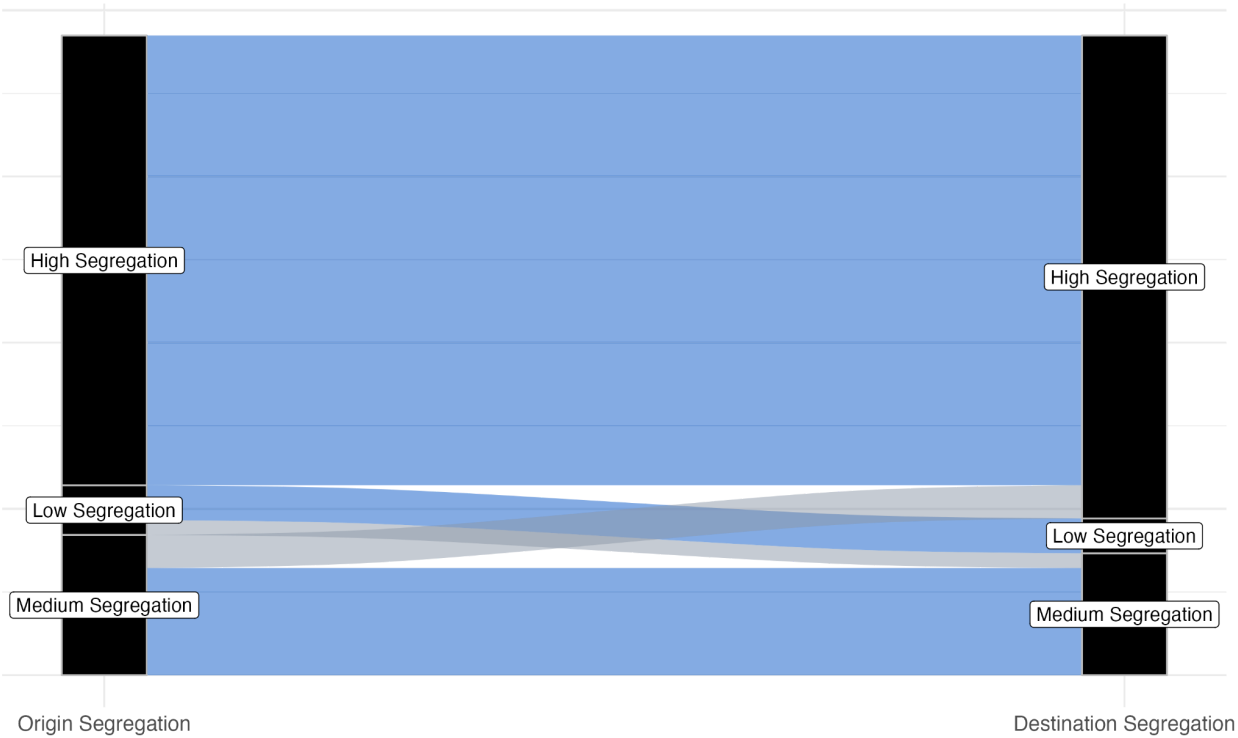
Origin Segregation   Destination Segregation

Notes: The flows highlighted in blue indicate the top flow between a given origin segregation category and a destination opportunity category. The width of each flow represents the count of flows for each origin segregation and destination opportunity pairing. The larger the width, the larger the flow. The vertical height of each bar indicates counts of individuals in a given origin or destination category.

**Figure 5: Flows by Origin Opportunity and Destination Opportunity**

Notes: The flows highlighted in blue indicate the top flow between a given origin segregation category and a destination opportunity category. The width of each flow represents the count of flows for each origin segregation and destination opportunity pairing. The larger the width, the larger the flow. The vertical height of each bar indicates counts of individuals in a given origin or destination category.

Table 1: High Potential Flows

	Origin CZ	Destination CZ	Total Flows
	(1)	(2)	(3)
Panel A: Top 3 Low Opportunity to High Opportunity Flows			
	Atlanta	New York	2,090
	Atlanta	Washington D.C.	1,431
	Detroit	Washington D.C.	724
Panel B: Top 3 High Segregation to High Opportunity Flows			
	New York	Newark	3,610
	Baltimore	Washington D.C.	2,959
	Newark	New York	2,868

Notes: As a benchmark, the total number of possible flows is equal to 4,475,814. Origin CZ indicates where an individual was located at age 16 (identified either by tax or HUD records). Destination CZ indicates where an individual was located at age 26.

Appendix Figure 1: Segregation, Migration, and Proximity to High Mobility Rate Colleges
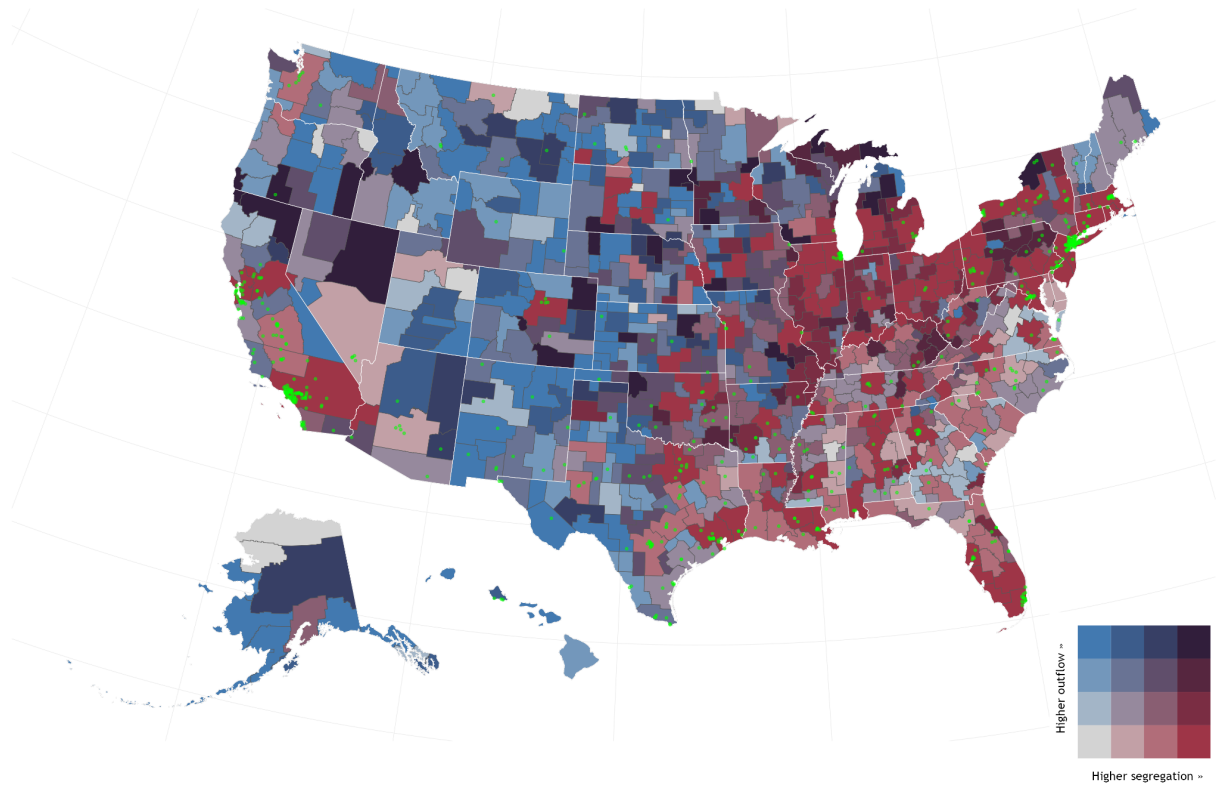
Notes: Percent of outflows represented as the number of people moving out of a given commuting zone divided by the number of people who live in the commuting zone. Percent of outflows calculated using migration data from Opportunity Insights. Note that the migration patterns are restricted to adults younger than 26. The black-white dissimilarity index was constructed using population estimates primarily from the 2000 Decennial Census and supplemented. Quantile breaks were used to determine the color ramp for both layers of data. Map projection used: USA Contiguous Albers Equal Area Conic. Commuting Zone shapefile from the Health Inequality Project. High Mobility Rate Colleges identified as colleges who were in and above the 75th percentile of college mobility rate scores