Evanston Unveiled: Mapping the Pathways to Economic Mobility

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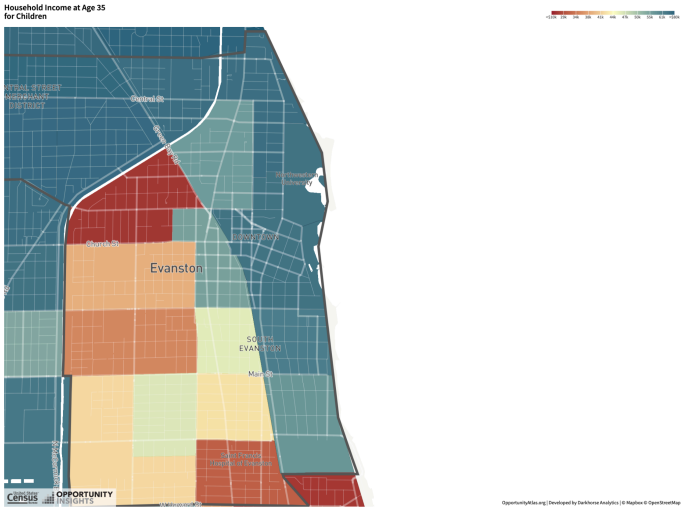
Introduction

Evanston, Illinois is a city defined by contrasts. Home to the renowned Northwestern University and a thriving medical center, Evanston is a hub of education and healthcare. However, the data presented in this image reveals a more complex reality:



The mean household income in the specific census tract I have chosen is $95,340, higher than the US-wide average of $80,335. This suggests relative affluence, likely tied to the influence of the university and medical institutions. Yet, this prosperity is not evenly distributed.

The fraction of residents with a college degree or more in this tract is 0.72, compared to 0.24 US-wide. Meanwhile, the poverty share is 0.21, exceeding the 0.13 US-wide average. Racial disparities are stark, with the white population at 77% and the Black community at just 3%, in contrast to the 13% Black population across the country.

Demographic Variable	Mean for Full Dataset	Mean for Specific Tract
Mean_Household_Income_2000	80,335.08	95,340.73
Fraction_with_College_Degree_or_More_2000	0.24	0.72
Population_Density_2000	1,987.44	4,452.72
Poverty_Share_2000	0.13	0.21
Share_Black_2000	0.13	0.03
Share_White_2000	0.69	0.77
Employment_Rate_2000	0.59	0.47
Population_Density_2010	5,236.19	14,882.05
Kfr_Pooled_Pooled_25	42.86	40.55

These findings point to the coexistence of opportunity and challenge within Evanston, shaped by the interplay of the city's renowned institutions and its proximity to the broader social and economic pressures of the region. In the following sections, I will delve deeper into the possible hypotheses that may explain this uneven landscape, to identify opportunities to improve upward mobility in the neighborhood.

Theory and Hypothesis

First Hypothesis: Influence of Northwestern University

In the census tracts surrounding Northwestern University, the presence of this prestigious institution has the potential to have a significant influence on the educational attainment and outcomes of the local population. Specifically, the higher fraction of individuals with college degrees in these tracts, alongside better educational performance in early childhood (e.g., third-grade math scores), suggests that the university's impact may be a driving force behind

increased upward mobility. This effect is potentially mediated by higher rents, which indicate more affluent neighborhoods that can afford better public and private goods, creating a more stimulating and resource-rich environment for children.

Potential Mechanisms:

- Higher Education: The higher proportion of college-educated individuals in neighborhoods near Northwestern University likely contributes to a richer intellectual environment, with access to better schooling options and more diverse professional opportunities. This can have a positive spillover cycle on the development and future outcomes of children in these communities.
- Test Scores: The educational quality and resources available in these areas, as reflected in higher test scores, can directly impact the cognitive development of local children, setting them up for greater academic and professional success down the line.
- Rent: The elevated rents observed in the tracts surrounding Northwestern University may serve as a proxy for neighborhood quality, including access to resources, safety, and community investment. These factors can be highly conducive to children's overall development and well-being, further contributing to the enhanced upward mobility seen in these areas.

Second Hypothesis: Influence of Public Spaces

Given Evanston's extensive network of 77 parks, census tracts within the city that have higher levels of public spaces may exhibit increased upward mobility among residents. This potential relationship may be rooted in the positive impact of public spaces on community cohesion,

physical and mental well-being, and environmental quality - all of which are conducive to fostering economic opportunities and social mobility.

Possible Mechanisms:

- Community Cohesion: Public spaces in Evanston can serve as hubs for interactions among diverse groups of residents, helping to build social networks that can facilitate access to job opportunities and support systems. By bringing people together in shared green spaces and recreational areas, these public amenities can strengthen community bonds and social capital.
- Physical and Mental Health: Numerous studies (such as referenced below) have linked access to green spaces and parks with reduced stress levels, higher physical activity, and overall better health outcomes. This, in turn, can contribute to an individual's ability to pursue educational and employment goals, ultimately enhancing their prospects for upward mobility.
- Environmental Quality: Well-developed and maintained public spaces often correlate with improved environmental conditions, such as cleaner air and water. These environmental factors can positively affect residents' health and cognitive function, further supporting their efforts to achieve economic security and social advancement.

Third Mechanism: Proximity to Crime

The high crime rates in neighboring Chicago can have a detrimental impact on upward mobility within Evanston's communities. Evanston's proximity to this major metropolitan area exacerbates this effect, as the city may experience a potential spillover of crime-related challenges or economic disadvantages that can hinder the opportunities available to its residents.

Possible Mechanisms:

- Direct Impact of Crime on Economic Opportunities: The elevated crime rates in nearby Chicago could directly influence the economic landscape of Evanston. Businesses may be less inclined to invest or may even leave the area, reducing job availability and stunting economic growth potential. This, in turn, can severely limit the upward mobility prospects for children growing up in these affected communities.
- Education and Crime: High crime rates can disrupt the education system, leading to lower school attendance and higher dropout rates. Schools in high-crime areas may have fewer resources and higher teacher turnover, ultimately impacting the quality of education provided to students. As poor educational outcomes are a strong predictor of lower upward mobility, this dynamic could be a key factor in shaping the social and economic trajectories of Evanston's youth.
- Psychological and Stress-Related Factors: Constant exposure to crime and violence, even if not directly experienced within Evanston, can have significant psychological effects on children. This environment of heightened stress and trauma can hinder cognitive development and the ability to succeed academically or professionally, further constraining opportunities for upward mobility.

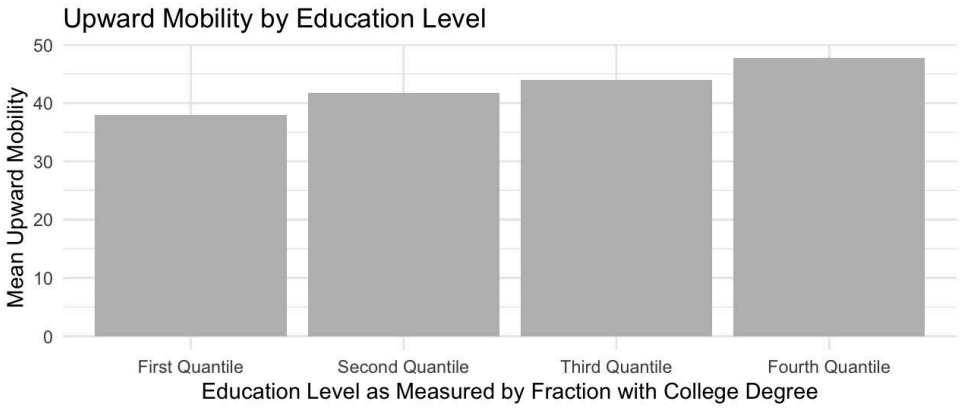
Data and Methods

Below, I have tried to investigate empirical evidence of each of the hypotheses:

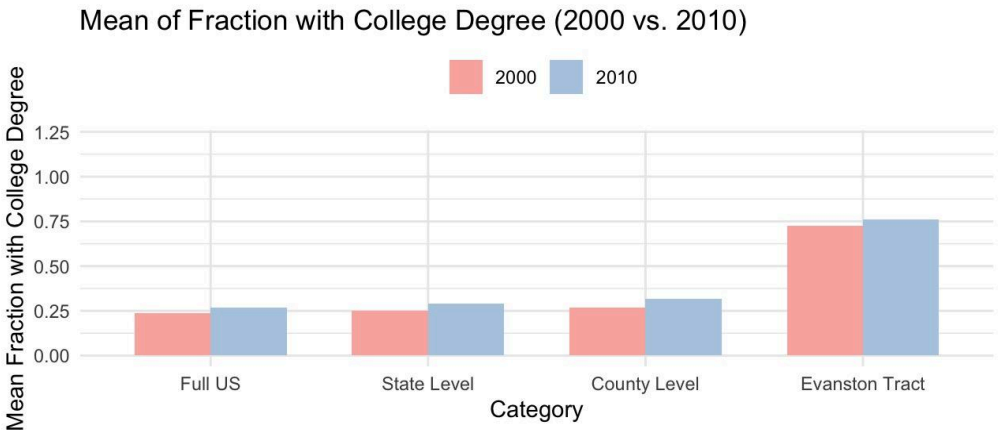
First Hypothesis: Influence of Northwestern University

a. **Higher Education Channel**

The graph below demonstrates that there is a clear positive relationship between upward mobility and education levels. As the fraction of people with a college degree or higher increases, there is higher upward mobility. This relationship is also confirmed by looking at the correlation coefficient between the two variables, roughly equal to 0.4966.



This relationship is of interest to us since as seen below, Evanston has a significantly higher proportion of people with a college degree or higher relative to the country, state, and county.



To further investigate whether this relationship holds controlling for race and economic effects, we run linear regressions as shown in the table below:

Each column corresponds to a regression between the absolute mobility measure and the fraction of people with a college degree or higher in 2000. The regressions control for shares of the population that is black, poor, and employed in the same year.

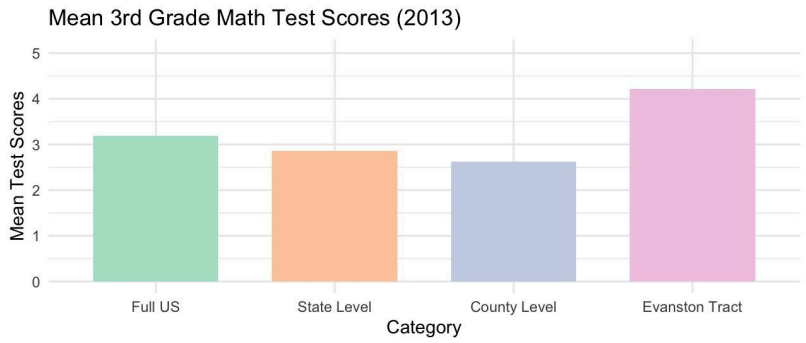
Regression Results

	Dependent variable:			
	Model 1	Model 2	Model 3	Model 4
Fraction with College Degree or More in 2000	21.060***	13.701***	16.234***	7.047***
	(0.137)	(0.139)	(0.119)	(0.177)
Share Black in 2000		-25.857***		-7.738***
		(0.216)		(0.244)
Poverty Share in 2000				0.00005***
				(0.00000)
Employed Share in 2000			-15.203***	-12.820***
			(0.089)	(0.094)
Constant	37.865***	42.923***	41.009***	39.946***
	(0.040)	(0.056)	(0.038)	(0.082)
Observations	71,933	71,929	71,933	71,926
R^2	0.248	0.373	0.466	0.510
Adjusted R^2	0.248	0.373	0.466	0.510
Note:	Dependent variable: Absolute Mobility at the 25th Percentile using Household Income as Income Concept			

As shown above, there is a clear and strongly positive relationship between absolute mobility and the share of people with a college degree. This estimate is also statistically significant and continues to remain so even when controlling for various race and economic factors.

b. Test Scores Channel

As with the share of college degrees, early test scores also have a positive relationship with upward mobility. More specifically, the correlation coefficient between the third-grade math test scores and upward mobility is 0.4256942. Similarly, this trend is important given that Evanston has significantly higher test score levels relative to the country, state, and county as seen from the bar graph below:

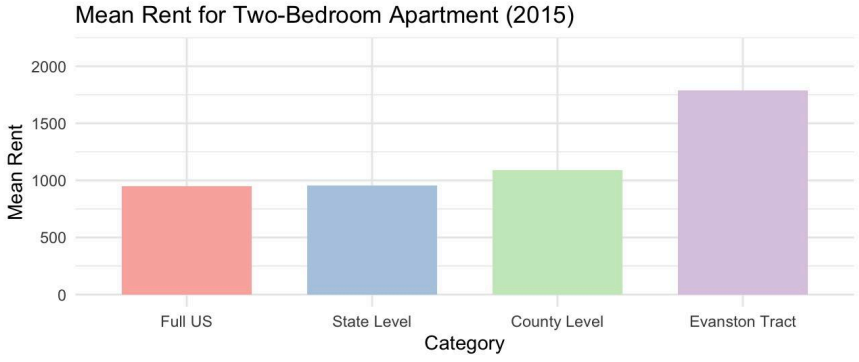


Confirming this relationship empirically, the regression table below shows that the relationship between third-grade math test scores and upward mobility is positive and statistically significant at the 1% level.

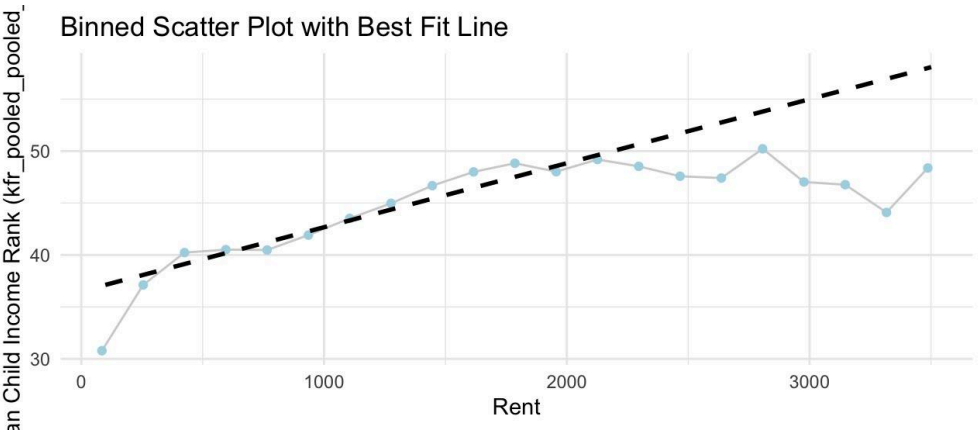
Regression Results

	Dependent variable:
	Absolute Mobility at the 25th Percentile
Grade 3 Math Scores in 2013	3.340^{***}
	(0.027)
Constant	32.211^{***}
	(0.088)
Observations	71,586
R^2	0.181
Adjusted R^2	0.181
Note:	*p<0.1; **p<0.05; ***p<0.01

c. Higher Rent Channel



Evanston tracts have a significantly higher mean rent for two-bedroom apartments as shown above, which could be a proxy for neighborhood value as shown above. Visually, there does seem to be a somewhat positive sloping best-fit line in the binned scatter plot below.



Confirming through the linear regressions, we see that the relationship between rent and upward mobility is not as strong as initially suspected, which aligns with the concept of opportunity bargain neighborhoods discussed in the class.

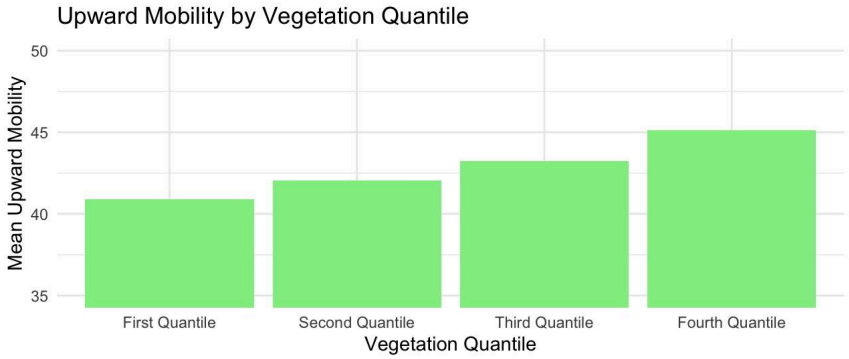
Regression Results

	Dependent variable:
	Absolute Mobility at the 25th Percentile
Mean Rent of Two Bedroom in 2015	0.006^{***}
	(0.0001)
Constant	36.508^{***}
	(0.071)
Observations	56,131
R^2	0.125
Adjusted R^2	0.125
Note:	*p<0.1; **p<0.05; ***p<0.01

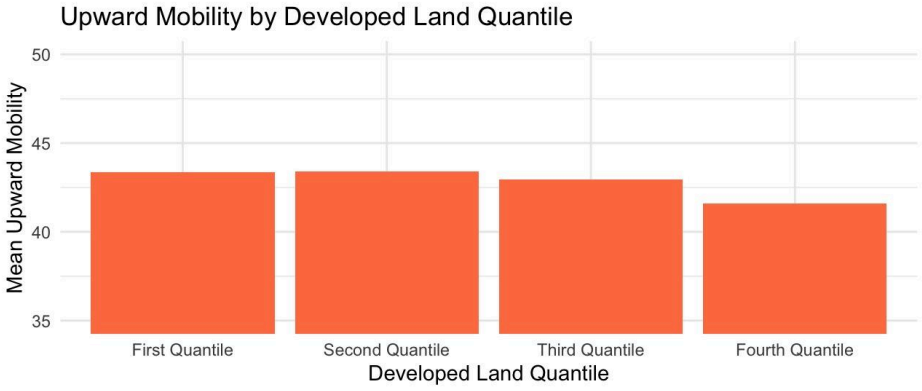
In conclusion, there seems to be evidence in support of our first hypothesis in the data set indicating a strong influence of the university on upward mobility. However, the high rent raises some concerns about whether these positive influences are evenly distributed.

Second Hypothesis: Influence of Public Spaces

The second hypothesis can be tested by checking for a relationship between vegetation (a possible proxy for public spaces). As shown below, there is a slight positive relationship between mobility and vegetation implying that tracts with higher vegetation have higher mobility.



A similar analysis for the variable developed shows a somewhat flat relationship, implying no clear relationship between upward mobility and the share of land developed in a particular tract.



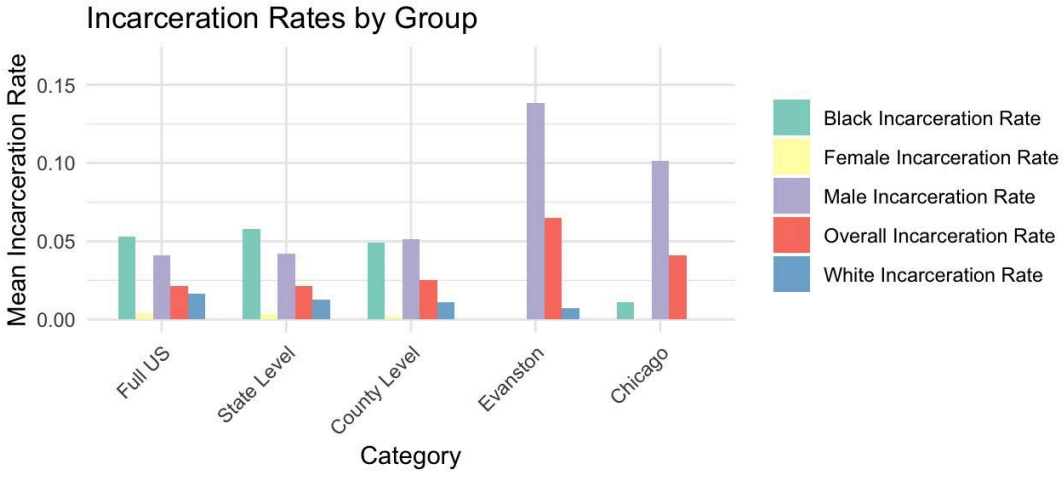
Confirming this from the regressions below, we see a strong positive relationship that is statistically significant between vegetation and upward mobility.

Summary of Linear Regression Analyses

	Dependent variable:		
	Absolute Mobility at the 25th Percentile		
	(1)	(2)	(3)
Vegetation	12.553***		12.243***
	(0.244)		(0.263)
Developed		-1.444***	-0.227***
		(0.067)	(0.071)
Vegetation + Developed	43.873***	43.655***	43.978***
	(0.033)	(0.047)	(0.047)
Observations	70,205	70,205	70,205
R^2	0.036	0.007	0.036
Adjusted R^2	0.036	0.007	0.036
Note:		*p<0.1; **p<0.05; ***p<0.01	

While there are many possible causal mechanisms discussed above that may shed light on how public spaces can improve mobility, it is possible that vegetation may not be the best proxy for it.

Third Hypothesis: Proximity to Crime

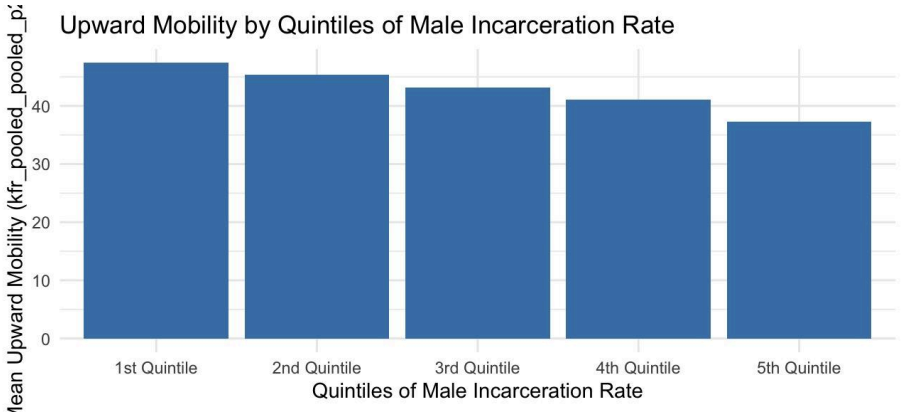


Finally, in order to understand the influence of crime, we look at mean incarceration rates within different races and genders below. To understand if there is any effect of proximity to Chicago,

the panel includes the mean for tracts in Chicago as well as Evanson, along with averages for the country, state, and county.

As we can see, the incarceration rate in both Chicago and Evanston is much higher than the averages for the county, state, and the US. In the case of Evanston, this is primarily driven by a very large rate of incarceration for males across all genders.

Next, to understand if male incarceration has any effect on upward mobility we see the graph below:



The bar chart illustrates that for each quintile, as the incarceration rate increases from the first to the fifth quintile, the upward mobility steadily decreases. This confirms the suspected negative relationship discussed in the causal mechanisms above.

Finally, to empirically estimate this negative relationship, we run a set of regressions on upward mobility with male incarceration rate, controlling for a set of economic and racial variables including mean household income, share of poor, and share of white people in 2000.

Regression Results

	Dependent variable:			
	Absolute Mobility at the 25th Percentile using Household Income as Income Concept			
	Model 1	Model 2	Model 3	Model 4
Male Incarceration Rate	-73.525***	-53.854***	-47.927***	-44.217***
	(0.515)	(0.457)	(0.454)	(0.452)
Mean Household Income in 2000		0.0001***	0.0001***	0.0001***
		(0.00000)	(0.00000)	(0.00000)
Poverty Share in 2000			-15.509***	-7.906***
			(0.239)	(0.280)
Share White in 2000				4.170***
				(0.083)
Constant	45.866***	37.201***	41.259***	36.819***
	(0.031)	(0.060)	(0.085)	(0.122)
Observations	71,474	71,457	71,457	71,457
R^2	0.222	0.431	0.463	0.481
Adjusted R^2	0.222	0.431	0.463	0.481
Note:	*p<0.1; **p<0.05; ***p<0.01			

The relationship between male incarceration and upward mobility is strong and negative. It is also statistically significant, even when controlling for possible racial and economic differences.

Key Takeaways

The data on Evanston, Illinois reveals a complex landscape where multiple, often conflicting forces are at play. On the one hand, the influence of the prestigious Northwestern University appears to have a positive impact on the community, contributing to higher levels of educational attainment and better test scores – all of which are associated with greater upward mobility.

The high fraction of college-educated residents suggests a thriving intellectual environment, providing access to better schooling options and diverse professional opportunities. This, coupled with the positive impact of Evanston's abundant public spaces on community cohesion,

physical/mental health, and environmental quality, creates conditions that are conducive to economic advancement and social mobility.

However, the data also points to concerning undercurrents of inequality and disadvantage. The poverty share is significantly higher than the US-wide average, indicating that the benefits of the university's presence and the city's public amenities are not evenly distributed. This disparity is further exacerbated by the stark racial imbalance, with the white population accounting for 77% of residents, while the Black community makes up only 3% - a stark contrast to the 13% Black population nationwide. A possible explanation for this could be the higher rents that make it prohibitively expensive for many groups to live here.

Another explanation may be the influence of proximity to Chicago, a city grappling with high crime rates and male incarceration. The spill-over effects of these challenges, such as the disruption of education systems, the psychological impact on children, and the weakening of community structures, could be limiting the upward mobility of Evanston's population.

It is important to note, however, that while the data reveals these concerning patterns, establishing causal relationships between the variables examined and upward mobility requires more rigorous analysis. The correlations observed, while informative, do not necessarily imply that changing a specific factor, such as the availability of public spaces or the incarceration rate, would directly lead to changes in mobility. Additional quasi-experimental research designs would be necessary to make such causal claims.

For instance, more specifically, analysis of developed areas and vegetation might not be an appropriate proxy for public spaces depending on the context, rendering those analyses to be less informative.

Further Analysis

One interesting avenue for further investigation would have been to inspect if Evanston being a healthcare hub translates to better health outcomes for the tracts and in turn better upward mobility for the neighborhood. This would be intuitive as better health outcomes translate to more productivity and less time and resources lost on illnesses. Further, to move beyond correlational evidence and establish causality, some possible methods include:

Synthetic Control Method

The synthetic control method offers a robust approach to further testing the hypotheses regarding the influence of Evanston's higher education institutions on upward mobility. This is a quasi-experimental research design that would require assembling a comprehensive dataset, including pre-intervention economic and demographic data for the treated census tract (i.e., the one with a high concentration of the university's presence), as well as post-intervention outcomes. In this case, the treatment refers to the creation of the University. Additionally, we would need to identify a pool of potential control units - untreated tracts that did not experience a similar university expansion but have pre-intervention characteristics closely mirroring those of the treated tract.

By constructing a synthetic control group, a weighted combination of the control units, and comparing the post-intervention outcomes between the treated tract and the synthetic control, we can estimate the causal effect of the university's presence. The underlying assumption is that the synthetic control group would have followed a similar trajectory to the treated tract in the absence of the university expansion.

However, we would need to ensure a robust selection of predictor variables for constructing the synthetic control, perform sensitivity analyses, and conduct placebo tests to check the specificity of the treatment effect. This is necessary to reduce concerns of potentially mismatching the treatment and synthetic control.

Propensity Score Matching

Another possible approach to establishing causal relationships is the propensity score matching (PSM) method. This technique would require data on both treated tracts (those with higher education institutions) and control tracts (those without such institutions), along with a wide range of pre-treatment characteristics that could serve as matching covariates. These covariates might include average income, poverty rates, racial composition, employment sectors, average educational attainment, and public investment levels.

By calculating propensity scores for each tract based on the matching covariates and then matching treated tracts to control tracts with similar propensity scores, we could compare the outcomes of these matched pairs to estimate the causal effect of the presence of a higher education institution on upward mobility. The key identifying assumption is that the tracts are comparable on all observed covariates, so any differences in upward mobility can be attributed to the presence of the higher education institution.

To address potential concerns in implementation here, we would need to include as many relevant covariates as possible to mitigate the effect of unobserved confounders, implement various matching algorithms to test the robustness of the results, and potentially combine the propensity score matching approach with a difference-in-differences framework to control for time-invariant unobserved heterogeneity.

By employing these quasi-experimental research designs, we can attempt to move beyond the associations observed in the initial data analysis so far and establish more definitive causal relationships between the presence of Evanston's Northwestern University and the patterns of upward mobility within the community.

References

1. Jennings, V., & Bamkole, T. (2021). Exploring the often fraught relationship between public spaces and social divides. *Brookings*. Retrieved from https://www.brookings.edu/articles/exploring-the-often-fraught-relationship-between-public-spaces-and-social-divides/
2. Colmer, J., Voorheis, J., & Williams, B. (2021). Air Pollution and Economic Opportunity in the United States.