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Equity in the NYC Public High Schools

INTRODUCTION

New York City is known for its 24 hours a day, seven days a week, non-stop public transportation service. Buses and subways are the lifelines of New York City, it dramatically reduces the time it takes to get from point A to B within the city compared to driving a car, and it's more economical for most people. During the days' peak, thousands of Metro Cards are swiped by commuters heading into Manhattan for work. Students also made up a significant portion of the swipes each day, but one thing is changing. These students are not necessarily riding public transit for a specialized high school or a prestigious high school like Townsend Harris High School. Instead, most of them are just heading to an average high school in a different neighborhood.

Equity has been on the table of discussion for years; the New York City Department of Education has promoted this term for years as well. However, one can still observe many students commute from one neighborhood to another on a daily commute. Yet, the school isn't part of the Specialized High School, nor is the school-based on screening applicants' quality for admission. Although we are promoting equity across schools, it appears that the equity cherished by City Hall is not working. This specific phenomenon explains why today, students are commuting to an overcrowded high school rather than attending the same average level high school in their zoned area, usually less crowded. This study will explore how the New York City Department of Education defines the budget for school and explore the myth behind the phenomenon. Is an overcrowded high school environment better equipped to help student

success? Do they get more funds for the different populations? What are the possible factors that make an over-packed school standout, worth the commuting and getting from class to class without being late?

LITERATURE REVIEW

When it comes to why people are commuting for jobs, for schools, one thing that comes to our mind is the quality, and the opportunity is better elsewhere, but people cannot afford to live in that specific neighborhood. The overwhelming commute of high school students from central business districts to less populated areas is almost identical: they cannot afford to live in one of these neighborhoods (Cherlin 2011). One study focusing on Asian-American communities also found that neighborhoods with higher resources, such as human capital, correlate with higher education quality, as more advocates for health-enhanced resources. Therefore, primary institutions serving the public are well-equipped and ready to serve the public compared to their counterparts (Walton 2012).

Many factors contributed to the school's overall quality. Perhaps one of the less well-known is the environmental quality. According to a study conducted by the Board of Regents of the University of Colorado, environmental quality like noise and traffic are the primary concerns (Sell 1985). Most children perceive a school in heavy traffic and noisy environments as not ideal for their studies, especially for younger kids. Many of them have trouble concentrating on academic work. How children perceive their neighborhood determines the quality of education within that neighborhood is not a particular case, many other studies suggest the same principle. A survey conducted among African American communities finds that if students rated their

community quality higher, it corresponds to a higher education attainment rate. This study also found an interesting pattern that gender plays a role in education quality. School with a higher male concentration usually corresponds to lower neighborhood expectations, hence a lower education achievement (Newton 15).

While some would consider the *environmental* quality, it does not concern every parent out there. Instead, researchers found that social networks play a role when a family chooses the ideal school (Jo 2017). In these studies, the researchers found that most parents have little to no school knowledge on their wish list. They chose the school simply because others told them to do so. Such behavior caused much inequality and virtual segregation since different ethnic communities have different ideas and preferences over the school. Doing minimal research on a school but replying to others' input is a misinterpretation because individual experience varies. Another study pointed out that even though disadvantaged students in an impoverished neighborhood can still achieve success, going to a so-called prestigious or above-average school doesn't guarantee 100% education achievement. (Owens 2010)

While Jo argued that social Networking or social capital could be harmful in the case above as it influences the way parents make choices about school, but it can also be translated into resources. For some education specialists, resources do not necessarily mean money or materialism, but they can be a social network that can translate into the needed materials for the classroom, according to other studies. In this one of the studies, the researchers found that social Networking usually provides more equity in accessing resources: Access to a personal computer, more personalized guide to complete a science project, to name a few (Ainsworth 2002). The definition of resources is not only limited to physical objects and instructional supports. The family structure is also considered a resource that can determine the quality of education. A

study was conducted to find the correlation between the father-child relationship and education quality. The stronger the father-child bond is, the better the education quality it becomes. Meaning a family with an "Always occupied" father is not ideal for quality education, suggesting that parents must play an active, not passive role in adolescent education (Mannon 2013).

While there's no doubt there are bad apples in our education system, some also argue that it's not a failure of a certain community but the system. In this journal, quality education is defined as the process that enables everyone to maximize their ability as an individual, family member, and citizen in a community and in the world (Allen 1971). The journal argues that education is about educating people about the characteristics that one should carry out, not about knowledge. Many different education specialists support this idea. Many would agree that the education system should not be ranking the school's performance on a single grade. This grade is a state exam (like the New York State's Regents Exam). This type of approach omitted much of the participation and efforts of the students and faculty (Pring 1992).

RESEARCH DESIGN & HYPOTHESIS

For this study, there are two hypotheses to be verified:

I. Today's phenomenon demonstrates that students are willing to travel for another average yet overpopulated high school. I predict that an overpopulated high school usually comes with better educational attainment. The relationship between the number of attendees and education attainment is positive.

II. If the first hypothesis is true, there will be factors contributing to the gap in achievement. Based on the literature review, resources are the most significant contributing factor to "better schooling" since it's needed for a better environment, more diverse curriculum, opportunities, etc. Therefore, if a high school has a larger student population, we can predict more funding poured into the school.

In order to address the question of whether an overcrowded high school aids students in academic achievement, it is best to download data from the Department of Education Official Website. The Department of Education releases the High-School Directory annually, which contains much information about a specific high school that would be a great place to start. For the question regarding population and achievement, we will extract the data of each school's student population, the four-year graduation rate, and to visualize it better, we will import the data into an Excel sheet and create a scatter plot. It is important to note that we are dealing with regular high schools, not prestigious high schools. Therefore for this study, we removed the statistics from schools that participated in the Specialized High School Admission Test (SHSAT) and schools with similar requirements, such as Townsend Harris High School. To observe a correlation between the two factors (Student Population vs. Graduation Rate in 4 Years), we will add a linear line to predict if the correlation is affirmative or negative.

As for the secondary question of my studies, if the first hypothesis is proved to be accurate, what made these overpopulated schools an ideal choice for incoming students? I will dive into how the New York City Department of Education's process of disbursing their allocated funds. Again, we will be obtaining the data from the official DOE website, and we will

look at how the equation for budget disbursement formed, the variables that take place in the calculation for the budget.

With this in mind, we will continue to dive into the issue. If a school is overcrowded, it's evident that the school supplies will be shared among more people, causing strings among supplies. So does a packed high school get more funding for the different student populations? If not, how does the NYC DOE Funding formula work to keep these overpopulated schools running smoothly daily?

DATA ANALYSIS

Section A: The Relationship between school population and student achievement

To resolve the first question of the study: Does an overcrowded high school provide better attunement for students? The preliminary response is yes, the preliminary results graphically show that schools with a higher population tend to have a higher graduation rate within 4 years (With some outliers) in the City of New York. Schools with a population below 350 are especially concerning as many of them have a graduation rate below or at 70%, with a few outliers. Although there's a relationship between the two, it's not a strong correlation. The correlation is particularly not significant in the boroughs of Queens and Staten Island. Therefore, the first hypothesis that an overpopulated school usually comes with higher education attainment is correct, given the relationship demonstrated between the two factors in the graph shown below. (Total Public High Schools by borough: Bronx/107; Brooklyn/98; Queens/59; Manhattan/55; Staten Island/10)

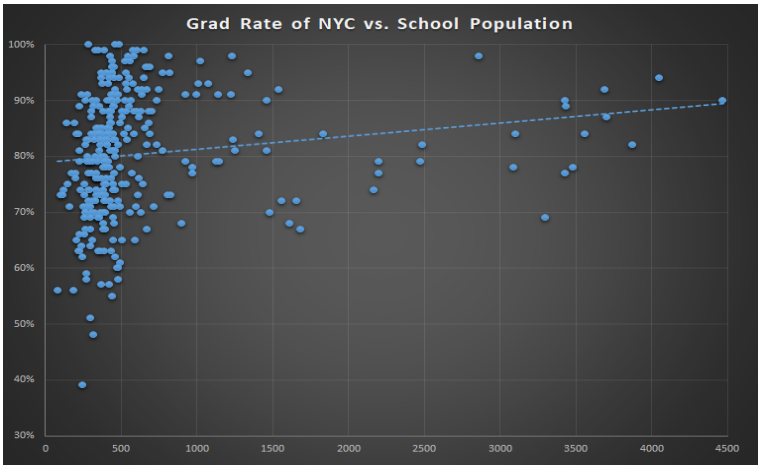

Figure 1, Graduation Rate of the New York City High School versus the School Population, with a linear trend line.

Figure 2, Graduation Rate of High Schools in New York City, divided by borough, versus the School Population, with a linear trend line.

Section B: Funding Formula Analysis

The New York City Department of Education funding comes from the city, state, and federal government, with more than 75% of the funding provided by the city and state government. The funds provided to the school are classified into two categories: Fair Student Funding (FSF) and School Allocation Memoranda (SAMs), respectively. The FSF offers the funds based on the pupil backgrounds, and the SAMs provides funds based on the school's special needed services, like teachers or supplies. Since this study concerns the student population and the student's achievement of high schools, we will be focusing on the FSF rather than the SAMs in the analysis below.

Since Fair Student Funding is the fundings based on students' needs and demographics, we will focus our analysis on this fund. The FSF uses the "Weighted Allocation" system, which has been in motion for decades, and it's been employed across urban schools in the United States. Under the "Weighted Allocation," schools are allocated funds based on students' demography, not the number of full-time faculty.

The "Weighted Allocation" New York Version consists of five different lenses: Grade Weight, English Language Learner, Special Education, Academic Intervention, and the Portfolio High Schools. Each category is composed of various weights. The higher the weight, the more FSF is designated to the school.

The first component, the grade weight, is dependent on the student's grade level. All high school students get 1 point weight. This single component has indicated that student population matters in how school receives funds, that schools with a higher student population generally will receive extra funding.

The English Language Learner section is only applicable where English is the second language for the student, particularly the ESL (English as a Second Language) students. If an ESL or ENL (English as a New Language) student can communicate effectively in English, the weight will be lowered. Students are assessed their English skills through the New York State English as a Second Language Achievement Test (NYSESLAT). The results provide an outlook of if a student achieved commanding proficiency of the English language. It is also worth noting that even though a student passed the NYSESLAT with the highest scores possible, the student can still receive "weight." Therefore, a school with higher student bodies of ESL Students, or a school located in an immigrant's neighborhood, generally receives more funding.

The third lens is Special Education, usually applicable to students with disabilities. Very similar to the English Language Learners category, if a student needs more accommodation in multiple perspectives and requires a Co-Teaching class, the higher the weight becomes.

The fourth lens, academic intervention, sounds very "special education" alike. It's designated for students with no disabilities. Instead, educational intervention is designed to help students who fall behind in their performance on the statewide learning standards. For example, a student who failed to pass the Regents Exam on Algebra One and Living Environment by his or her junior year (Which are both taught in Freshman year during a regular coherent) would be assigned a high weight in this category. If a student is on-track for high school graduation within four years, no weight will be assigned for the student. With that in mind, this is to predict that an underperforming school would likely receive more funding due to its weight in the academic intervention portion.

The final portion that gets calculated into the weight is the school portfolio. For the purpose of this study, this section plays a minor role. This portion gives weight to school with a

more rigorous career and technical education curriculum, hosts special academic programs, and schools with more rigorous admission standards, and schools that require an audition for admission like the LaGuardia High School. Since this has to do with how a school operates, not the student population or demography, this portion is not of concern in this study.

Overall, an ESL Student with low English proficiency (Beginner Level Proficiency, the lowest rating), disability, and required academic intervention (fall behind in-state examination, in this case, unable to achieve a passing grade in the Regents Exam) who participated in a special educational program would likely accumulate the most amount of "weight," hence the Department of Education would disburse more funds in this circumstance.

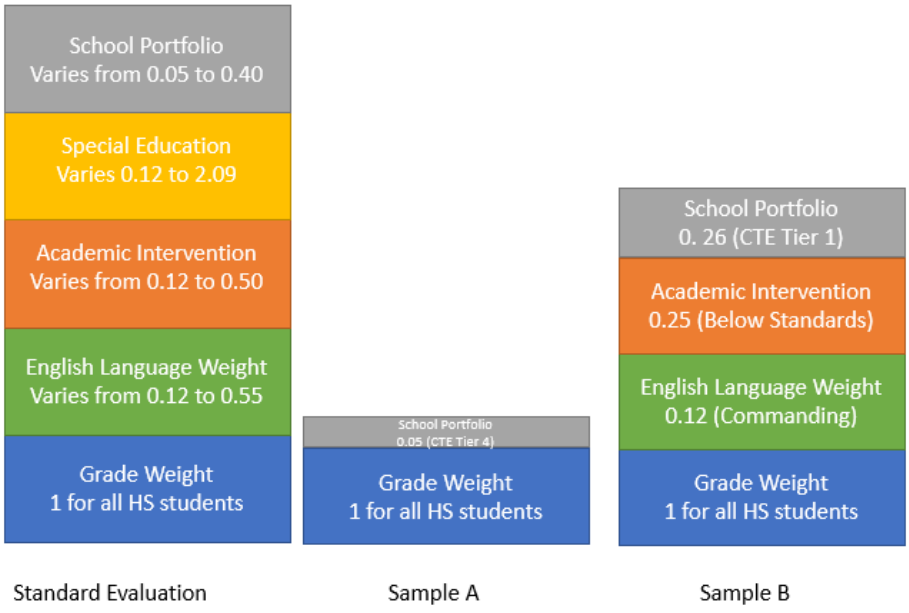

Figure 3: Method of Evaluation, where sample A is a student in good academic standing, attending a Tier 4 CTE (Career Technical Education) School, sample B is a student who may failed the state exam with commanding proficiency via. NYSESLAT Exam, attending a Tier 1 CTE school.

(*)To print in Internet Explorer, in Paper Options use "Enable Shrink-to-Fit" and in Page Setup and set the print margins to .25

Fair Student Funding Formula Details[1]		AA	BB	CC	DD	EE DD * BB	FF DD - CC	GG FF * BB
					FY 2022 Formula		Register Change	
Fair Student Funding Weighted Register Formula		FY 2022 Weight	FY 2022 Per Capita[2]	FY 2021 Actual Registers[3]	Register[3]	Amount	Register[3]	Amount
I.	Grade Weight			350	360	$1,565,742	10	$43,493
Need Weight Total				306	318	$885,873	12	$34,753
II.	Academic Intervention			192	202	$308,821	10	$20,056
III.	English Language Learner (ELL)			36	36	$71,235	0	$0
IV.	Special Education Services[4]			78	80	$505,818	2	$14,697
V.	Portfolio			0	0	$0	0	$0
TOTAL FAIR STUDENT FUNDING WEIGHTED REGISTER AND FORMULA				562.01	580.54	$2,451,616	18.53	$78,246

Figure 4: A Sample School with a student body population of less than 400, showing indication that more than 85% of the students receives additional funds based on their need, while no funds were given for the school portfolio. (78246/350=223.56 per capita; Grad. Rate: x <70%)

(*)To print in Internet Explorer, in Paper Options use "Enable Shrink-to-Fit" and in Page Setup and set the print margins to .25

Fair Student Funding Formula Details[1]		AA	BB	CC	DD	EE DD * BB	FF DD - CC	GG FF * BB
					FY 2022 Formula		Register Change	
Fair Student Funding Weighted Register Formula		FY 2022 Weight	FY 2022 Per Capita[2]	FY 2021 Actual Registers[3]	Register[3]	Amount	Register[3]	Amount
I.	Grade Weight			4,389	4,331	$18,836,748	(58)	($252,258)
Need Weight Total				2,047	2,038	$5,928,770	(9)	$79,330
II.	Academic Intervention			774	778	$1,050,305	4	($4,015)
III.	English Language Learner (ELL)			635	635	$1,154,049	0	$0
IV.	Special Education Services[4]			638	625	$3,724,416	(13)	$83,346
V.	Portfolio			0	0	$0	0	$0
TOTAL FAIR STUDENT FUNDING WEIGHTED REGISTER AND FORMULA				5,905.39	5,864.44	$24,765,517	(40.95)	($172,928)

Figure 5: A Sample School with a student body population of more than 4000, while less than 50% of the student population receives additional funds based on their need, with no funds were given for the school portfolio. (172928/4301=40.02 per capita; Grad. Rate: x > 90%)

DISCUSSION

While we narrowly established the relationship that a school with a higher population equates to better achievement, this is not a strong correlation as the graphs (Specifically Figure 2) have demonstrated. Even though the city follows the hypothesis, specific boroughs such as Queens and Staten Island do not follow the same trend. On the contrary, the trendline appears to be negative or stable.

A possible explanation for such a trend can be the area-to-school ratio, back to the Excel Sheet, clearly shows that while Queens is the largest borough, the second-most populous borough in the city. The number of public high schools located in Queens is half of the number of high schools in Brooklyn or Bronx, even though Queens is two times larger than the borough of the Bronx. This could explain that commuting to high school is not an option but a requirement for students because there aren't high schools in a specific neighborhood.

As for Staten Island, although it's the least populous borough of the city, the schools that matched our research criteria come out to be ten, which could be a reason as to why we have the discrepancy, simply that there are not a lot of school choices available.

Another possible explanation for the two boroughs is something they both have in common: the subway system doesn't extend to much of the borough in both areas. On Staten Island, there is no subway beside the Staten Island Railway. In Queens, most subway stations are in the western end neighborhood of Astoria or Long Island City, which is right next to Manhattan. They are concentrated in Central Queens, the community of Jamaica, which is the *de facto* administrative center of Queens.

The New York City High School Directory also supports the discrepancy of school availability in Queens as well as Staten Island, where a school district is much smaller in the rest of the city, especially in the Bronx, the school districts in Queens and Staten Island encompass of a much larger region: for Staten Island, the School District 31 contain the entire borough, and in Queens, many neighborhoods were cut off the map, especially in the Northeast Queens Region, which is right next to Nassau County(i.e., College Point, a community on Northern Queens, was not included in the map). There are also considerably more high schools, on average, in each school district in other boroughs compared to Queens and Staten Island.

As for the relationship between student population and funding, there indeed is a relationship between the two. As we witnessed in the data analysis section, each student contributes one weight regardless of particular circumstances. However, proportionally speaking, a school with the following conditions would receive the most funds per capita: located in an immigrant's neighborhood, hence having a large ESL student population whose English proficiency skill is ranked low; a community with high poverty, likely to cause a more increased need in academic intervention; and finally, special programs been hosted in the institution.

The above traits usually describe a school that's located in a working-class neighborhood, a school with a lower-than-expected performance or academic achievement will receive more funds per capita, and more individual attention is given. The second hypothesis of this study is partially false, depending on the perspective.

Suppose we are to say, comparing the funds' allocation across public high schools in New York City. In that case, there's no doubt that the general funds being distributed to a 3000-population school is higher than what a school with only a few hundred populations would receive. But when talking in terms of per capita, schools with lower populations receive more

because these schools' demography consists of students with disabilities, inability to use English, or are in danger of dropping out and unable to complete high school education.

While we have successfully verified the two-hypothesizes made at the beginning of the studies, it also poses another question that is interesting to investigate: We know that an overpopulated high school receives equal, or in some circumstances, less funding per capita as opposed to the school with higher funds per-capita, then why does the school receive more funds still fails to achieve the equivalent or better educational attainment, specifically, schools with a population of less than 400? Although our literature review suggested that financial resources are the primary reason behind the academic quality gap across urban public high schools, and what's on parents' minds when deciding which high school to attend, this study clearly shows that there is more than just the funding problem.

Also, it is essential to note that we use the graduation rate within four years as a measure of student achievement in this study. This is just a rough estimation of educational attainment, and we can make the measurement more precise by considering other factors. In the State of New York, high school graduation consists of obtaining either a Regular Regents Diploma, where students are only required to complete one math (Algebra) and one science (Living Environment) Regents Exam with a bunch of electives to fulfill. Or an Advanced Regents Diploma, where there's a shrink in the elective portion, instead the students need to do more science classes (Chemistry, Physics) and math classes (Geometry, Algebra II and Trigonometry). One thing that could be improved to make the results more precise is considering the number of students who achieved Advanced Regents Diploma and the number of students who completed the regular Regents Diploma across high schools and maybe with the inclusion of such precise measurements. We could find another relationship between our variables.

CONCLUSION

A successful research study must be able to explore the answers for questions that cannot be answered elsewhere, such as the literature review, or via. a search engine like Google, although, in this research paper, the search engine was used to aid in finding and filtering the original data set and allocation equation that was employed by the Department of Education in New York City. In that respect, this research successfully answers and validates one of my hypotheses.

However, no research is perfect in addressing every issue. The same goes for this study. As we uncovered the discrepancy in school funding allocation, we also found other questions associated with it, opening more space for imagination and research.

BIBLIOGRAPHY

Ainsworth W. James (September 2002), Why does it take a village? The mediation of neighborhood effects on educational achievement, Social Forces, Vol. 81 No. 1, *Oxford University Press*, 117-152

Allen F. Anita (Summer 1971), Perspectives on Quality Education, Educational Horizons, Quality Education: Whose Responsibility? Vol. 49 No. 4, *Phi Delta Kappa International*, 100-107.

Amato W. Peter (September 1969), Residential Amenities and Neighborhood Quality, Ekistics, Home Life and Leisure in the Megapolis, Vol. 28 No. 166, *Athens Center of Ekistics*, 180-184

Bennett R. Pamela, Cherlin J. Andrew (September 2011), The Neighborhood Contexts in Which Low-Income Families Navigate Welfare Reform: Evidence from the Three-City Study, Social Science Quarterly Vol. 92 No 3, *Wiley*, 735-760

Lareau Annette, Jo Hyejeong (April 2017), The American Tradition of Inequality: Neighborhoods and Schools, American Educational Research Journal, Vol. 54, *American Education Research Association*, 190-192

Minnotte Lynn Krista, Pedersen E. Daphne, Mannon E. Susan (January 2013), Work and Family Stressors and the Quality of Father-Child Relationships: Do Neighborhood Resources Matter? Sociological Focus, Vol. 46 No. 1, *Taylor & Francis, LTD*, 68-84

Miles Karen Hawley, Roza Marguerite (2006), Understanding Student-Weighted Allocation as a Means to Greater School Resource Equity, Peabody Journal of Education, Vol. 81 No. 3, *Taylor & Francis, LTD,* 39-62

Newtown A. Veronica, Sandoval J.S. Onesimo (June 2015), Educational Expectations Among African Americans suburban low to moderate-income public high school students, Journal of African American Studies, Vol. 9 No. 2 *Springer*, 135-156

New York City Department of Education (2021), 2021 NYC High School and Specialized High Schools Admission Guide, 52-188

New York City Department of Education Division of Finance (June 2021), Fair Student Funding and School Budget Resource Guide, FY 2022, 15-42

Owens Ann (October 2010), Neighborhoods and Schools as competing and reinforcing Contexts for Educational Attainment, Sociology of Education Vol. 83 No. 4, *American Sociological Association*, 287-311

Sell L. James (Summer 1985), Children and Neighborhood Environmental Quality, Children's Environments Quarterly, Vol. 2 No. 2, *Board of Regents of the University of Colorado*, 41-48

Walton Emily (September 2012), Resurgent Ethnicity among Asian Americans: Ethnic Neighborhood Context and Health, Journal of Health and Social Behavior, Vol. 53 No. 3, *American Sociological Association,* 41-48

EXTERNAL MATERIALS

Excel Sheet on the data collection: https://bit.ly/3mW8jic

New York City Fiscal Year 2022 DOE Funding of a sample school: https://bit.ly/3wtwO9i

New York City Fiscal Year 2022 DOE Funding Manual: https://bit.ly/3BXKmLJ