

Alpenglow: Binghamton University Undergraduate Journal of Research and Creative Activity

Volume 7
Number 2 *Life at the Confluence of the
Susquehanna and Chenango Rivers*

Article 2

9-20-2021

Collapse at the Confluence: A Comprehensive Analysis of the Binghamton City School District

Bryn Lauer
blauer1@binghamton.edu

Lucas Peterka
lpeterk1@binghamton.edu

Follow this and additional works at: <https://orb.binghamton.edu/alpenglowjournal>

Recommended Citation

Lauer, B., & Peterka, L. (2021). Collapse at the Confluence: A Comprehensive Analysis of the Binghamton City School District. *Alpenglow: Binghamton University Undergraduate Journal of Research and Creative Activity*, 7(2). Retrieved from <https://orb.binghamton.edu/alpenglowjournal/vol7/iss2/2>

This Article is brought to you for free and open access by The Open Repository @ Binghamton (The ORB). It has been accepted for inclusion in Alpenglow: Binghamton University Undergraduate Journal of Research and Creative Activity by an authorized editor of The Open Repository @ Binghamton (The ORB). For more information, please contact ORB@binghamton.edu.

Abstract

This project analyzes student exam scores in the Binghamton City School District (BCSD) in comparison to New York State averages and to the school districts in Troy, Schenectady, Utica, and Niagara Falls. By collecting data from twenty-one different school years, provided by New York State on the New York State Education Data Site (NYSED), we illustrate a clear decline from the state mean in Binghamton's academic performance that remains in line with the pattern of academic performance in the other four, previously mentioned, school districts. To look at why this is occurring, we collected population data from the U.S. Census Bureau; gathered budgeting and education data from NYSED and the United States Department of Education; and conducted interviews with district leaders to understand factors that influence student achievement. Our analysis reveals a rate of population mobility and a pattern of per-pupil expenditure - within the Binghamton community - that is disproportionately higher when compared to averages at the state level and with some of its peers. Our study indicates that ELA exam scores rise with the increase of expenditures, while math scores do not, and that total expenditures are more impactful than instructional. Research also points to poverty and parent engagement as influential factors on exam scores but is unable to make any definitive correlation. Despite what our interviews suggested would be the case, results do not support population mobility as a determining factor in exam outcomes. Our results suggest that policies that allocate expenditures more effectively, that keep parents involved, and that revise current testing standards when considered in conjunction with our literature review, are the most necessary state education reform for education. Results alone, however, are unable to point to any definitive causes behind BCSD's underperformance or provide solutions.

A Comprehensive Analysis of the Binghamton City School District

The Components of Academic Achievement

With more children enrolled in K-12 public schools than at any other point in history, the school environment is more important than ever for the development of America's youth (NCES, 2019). The primary education system has undeniably become a vital aspect of modern American society, but consensus on its effectiveness for development remains elusive. When the education system functions correctly by meeting student's individual needs, school can be an enriching, lively environment for development and achievement (Wotherspoon, 2004). Schools benefit

students' well-being physically and mentally. A successful education predictive of a healthier lifestyle and longevity, even in impoverished countries (Cutler & Lleras-Muney, 2010). Beyond physical health, academic achievement leads to a sense of accomplishment and overall well-being (Quinn et al., 2007). Therefore, it is of interest to American families and policymakers alike to ensure that students receive an outstanding education. The question remains, how does one go about formulating an education system that produces academic fulfillment?

Funding is a good place to start. However, research reveals that the effect of expenditures on academic outcome is far from an agreed upon topic. Some studies find that increasing expenditures on instruction and support services matters, while others find no variation between school resources and academic achievement (Jackson et al., 2016; Häkkinen et al., 2003; Hanushek, 2003). Additional studies have shown that spending has more influence when it targets certain programs, such as funding dual-enrollment classes and early childhood programs (Elango et al., 2015; Alexandar et al., 2014). Because of this, it is possible that factors that directly impact a student's home life, such as poverty and the socioeconomic status (SES) of the area, may have stronger influences on exam scores than government spending.

Poverty has the potential to be extremely harmful to a student, more so than other factors. A student below the poverty line is at greater risk for academic, mental, and physical difficulties—although early intervention can alleviate all of the mentioned outcomes (McLord, 1998). Even when low SES was controlled for, one study found that living in an impoverished neighborhood is strongly associated with poorer academic skills (Nieuwenhuis & Hooimeijer, 2016). Moreover, a low parental SES affects student performance negatively (Farooq, 2011). In

addition to poverty, studies show other aspects of a student's environment have the potential to harm student performance and mindsets. Researchers have found that environments which produce negative emotionality, such as ineffective school environments, can bring grades down (Oakes, 2017; Raymond et al., 2002; Valiente, 2012). Others have found positive relationships between education and social support systems, effective school leadership, mental health, high mobility rates, and consistent social work, among others (Alvarez et al., 2009; Finigan-Carr & Shaia, 2018; Körne, 2016; Mendels, 2012; Simpsons & Fowler, 1994). Yet across all domains, despite the importance of what was previously discussed, research consistently points to the family life of a student as being one of the most influential factors on one's academic situation.

A recent study, that encompassed around 600,000 students across the country, found that "family background [explains] more about a child's achievement than school resources" (Egalite, 2019). Parenting style in and of itself has been found to be the best predictor of academic success (Altschul, 2011; Majumder, 2015). Family influence on children is more predictive of high academic performance than individual motivation (Halawah, 2006) The evidence points to an overwhelming consensus that what has the most influence on a child's life in school is what happens at home. The CDC released a report outlining numerous strategies to assist parents and schools in fostering better health education through engagement between both parties. However, the principles they established could apply to all aspects of education. Based on research from the fields of psychology, sociology, education, and health, the CDC believes in three principles: connecting parents to the school, providing opportunities to engage, and sustaining the connection by mitigating common problems that prevent involvement. Schools must set

expectations about involvement, keep a friendly environment, maintain open communication, create partnerships with the community, make use of incentives to encourage involvement, and address language and cultural barriers. Examples of policies include providing parent-friendly resources to assist with homework, community-sponsored educational classes for parents, hiring translators, holding meetings online, creating volunteer opportunities at school events, and allowing means of communicating feedback consistently (Center for Disease Control and Prevention, 2012).

The Role of Standardized Testing

American education departments have developed standardized exams to gauge staff effectiveness and student performance. When the No Child Left Behind Act (NCLB) was passed in 2002, state governments were required to institute measures of academic proficiency but were not provided expectations for federal standards. As a result, state definitions of student proficiency vary wildly. So, while testing exists in every state, comparing different states' student scores does not accurately reflect student capabilities and makes national diagnoses of educational issues unobtainable. The current system does allow, however, for informative comparisons on a state and local level, as has been done in this paper.

Even before NCLB, the New York State Department of Education administered annual exams to its public education students, in grades 3 through 8, on the subjects of English Language Arts (ELA) and mathematics. These exams measure the academic proficiency of the state's students and are used to gauge the effectiveness of the state's teachers and principals.

There are four possible grades on the tests, and they are denoted by the numbers 1 – 4. New York State (NY) deems scores of 3 or 4 as proficient and deems scores of 1 or 2 as unsatisfactory. Proficiency rates are the percentage of the student body that gets a 3 or 4 on the exams. Reports of these scores are available to the public on the New York State Education Data Site (NYSED). Every school, every district, and county have their scores posted for every school year since 1999. This allows for an in-depth examination of the overall NY education system, and a comprehensive analysis of the smaller compartments that make up the state system.

Context

When looking at the exam scores for the Binghamton City School District (BCSD) for the 2018-19 school year, we noticed a huge discrepancy between the district's scores and the state's scores. In the most recent year, the average proficiency rate in BCSD, across all grades, was 26.5 percentage points below state averages in ELA and 27.5 percentage points below state averages in math (NYSED, 2019). With twenty-one years of exam scores at our disposal, we wanted to map the progression of BCSD's proficiency to discover how the district had arrived at the point it did in 2019. In addition to exam data, we collected data on potential influencers on those exam scores that include per-pupil expenditures, population mobility, poverty rates, community data, socioeconomic data, enrollment numbers, attendance rates, and population numbers. The goal being, ultimately, analyzing this additional data and discovering an anomaly in the Binghamton environment that allows for its academic underperformance to persist.

Since the 2000-01 school year, the average spent on US public elementary and secondary schools has risen 18% from \$10,458 to \$12,330 in 2015-16 (NCES, 2019). At an amount

reported by the National Center for Education Statistics (NCES) of \$23,535 per student, BCSD spent nearly double the national average on students during the 2018-19 school year. However, even with spending at above the national average, BCSD spending still falls below the NY average of \$25,845 (NYSED, 2019). When looking at exam scores, students enrolled in the Binghamton City School District are falling short. Is it possible that the discrepancy in BCSD test scores is due to the discrepancy in spending? Granted, BCSD's spending is below the New York state average, but only by a margin of about 11%. And, Binghamton students are outperformed by those in other New York towns, of similar demographics, who spend well below the state average (NYSED, 2019). When choosing which variables to measure, we focused on exploring those aspects of the Binghamton environment that had the most potential to impact students by pulling from the aforementioned research, and the government level decisions that might have effects on student performance. For instance, Binghamton struggles with a poverty level higher than any other town in Broome County, with a staggering 25% of families below the poverty line and 48% of children under 18 in poverty (ASC, 2018). Just as alarming is Binghamton's struggle with population loss, ranking 19th out of 25 with a rate of -3.7% population growth from 2010-17 (Stebbins, 2019). Students may find it difficult to foster peer to peer relations in school if there is a consistent drop in student population. Moreover, papers released by BCSD have cited high levels of mobility among students as a serious and pronounced challenge (Futures Education, 2015; The Binghamton Board of Education, 2018). An interview we conducted with a Binghamton school principal touched on the issue of mobility when he revealed that, in their school alone, "...whole classes of students leave at a time" (2019).

And in an interview with an upper-level district official, it was said, “We have a mobility rate of about 40. What that means is every year, in September, we have a roster of students of 5100.

And, if you look at that same roster in June, 40% of those names have changed” (2019).

According to the BCSD principal, it is not uncommon for students to miss class up to 50 days a year.

As a result of the background research conducted on the Binghamton area and in the field of education, we collected data on a multitude of potential outside influences on BCSD exam scores. Mobility and school spending became our core variables as research progressed because of its variance from the norm in Binghamton. Mobility data was collected from the US Census Bureau through American Community Surveys (ACS), and is represented as the percent of the population that has moved houses within a given year. School spending is broken into two categories: instructional and total. According to NYSED, instructional expenditure is defined as the ratio of pupil to money towards “...classroom instruction (excluding Special Education) plus a proportion of building level administrative and instructional support expenditures... District expenditures, such as transportation, debt service and district-wide administration are not included” (NYSED, 2019). Total expenditures include costs of classroom instruction, “...as well as expenditures for transportation, debt service, community service and district-wide administration that are not included in the Instructional Expenditure values...” (NYSED, 2019).

Influenced by the interviews we conducted—our hypothesis is that the rate mobility of Binghamton’s population would be the main cause of its academic underperformance.

In addition to BCSD, we collected data on the school districts in the cities of Utica (UCSD), Troy (TCSD), Niagara Falls (NFSD), and Schenectady (SCSD). These districts were

chosen because they are considered socioeconomically similar to BCSD by the Office of the New York State Comptroller (2016). The state of New York was included to represent data from a larger range of socioeconomic statuses.

Methods and Materials

Data Collection

Scores on the NY ELA and math exams were collected from NYSED for BCSD, UCSD, TCSD, NFSD, SCSD, and NY State averages to measure academic achievement. The exam data was sampled from every school year, between and including, 1998-99 to 2018-19. Per-pupil instructional and per-pupil total expenditures were collected from the NYSED from the school years 2011-12 to 2018-19. Pulling from previous research from education literature and the BCSD, data on students' annual attendance rate, enrollment numbers, student suspensions, and teacher turnover rate was collected from NYSED to measure student and school instability. Data on students eligible for free lunch, poverty rates, income, civilian unemployment for those 16 years of age and older, and value of homes were collected using median values from the years 2014-18 to analyze the effect of income levels and community well-being. Mobility data was collected from the US Census Bureau from the years 2012 to 2019 using 5-year ACS estimates. Further community data was compiled using ACS 1-year estimates from the US Census Bureau, including the percentage of children under 18 years of age living in an unmarried household, and percentage of population in the city who graduated high school for the years 2012-18. The difference in using ACS estimates versus median values among different years was only because of the availability of the data.

Data trends on academic achievement were compared to the earlier mentioned factors to analyze possible correlations. It was expected that the strongest correlations between high academic achievement and outside factors would be high mobility and poverty, and that expenditures would show little correlation. We also expected that downward trends in academic achievement would correlate with downward trends in socioeconomic status and community well-being.

Statistical Analysis

All data was input into Microsoft Excel. Functions in Excel were then used to reveal trends in the data, such as the plotting of data along a graph or the implementation of bivariate regression analysis.

Interviews

We conducted interviews with two, unnamed sources in the Binghamton City School District. One holds an upper-level, administrative position in the school system and the other is a principal at one of the schools in the district. Both were interviewed to gain greater insight into the factors that affect student academic achievement in ways that data and numbers cannot provide. Questions were asked regarding parent and student attitude, mobility in the school system, poverty, and expenditures. Interview data were used to supplement trends analyzed during the statistical analysis and provide further explanation.

Results and Discussion

The Progression of Proficiency

When the state publishes their annual exam scores, they are given on a grade level basis (3-8). The content on these tests, and the knowledge of the student, is dependent on the grade level so, it makes sense for the state to publish rates of proficiency by grade. Unfortunately, this makes it difficult to assess long-term trends as it gives us multiple variables to consider in any given year. To combat this, we took each grade's rate of proficiency—in all the available school years—and averaged them out in order to obtain one proficiency rate for each year in BCSD. As is always true of averaging data, average proficiency rates are sensitive to extreme values. Therefore, it is possible that proficiency rates might be over exaggerated from what they truly are. We then plotted that data out for both the ELA and math scores. We repeated the process for scores in UCSD, TCSD, NFSD, and NY. The resulting graphs can be seen in figures 1 and 2.

Figure 1

Graph of the Average Rates of ELA Proficiency

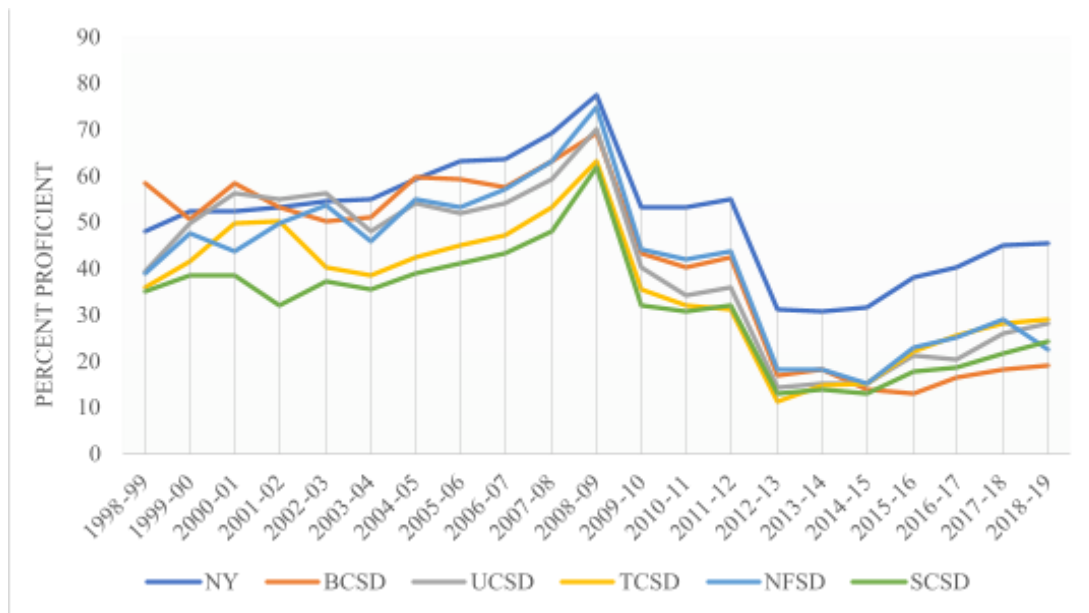
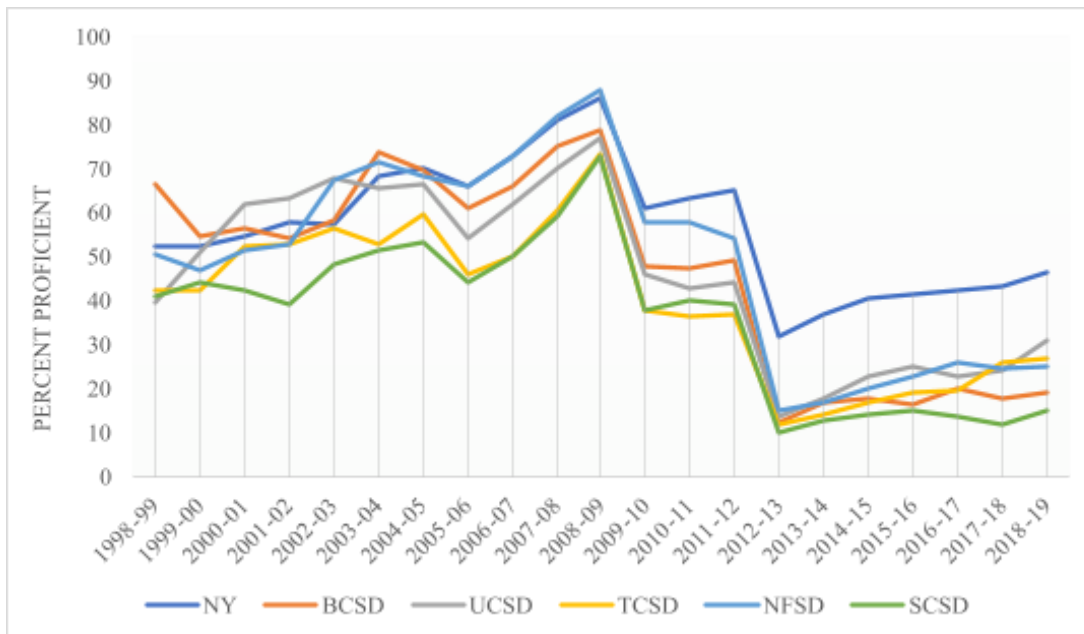


Figure 2

Graph of the Average Rates of Math Proficiency



Representing the data in this manner reveals some interesting trends. In the 2009-10 and 2012-13 school years there were statewide drops in proficiency rates. State averages dropped by over 24 percentage points in both school years and in both subjects. Each of the five districts saw similar declines. Interestingly, significant policy changes occurred in both of these years. In a letter to NY parents, Commissioner of Education John King writes, “Today, we are releasing our 2013 test results. You will notice that more students struggled on this year's test than in previous years. This is because we changed the expectations for New York State students when we adopted the Common Core State Standards. The Board of Regents adopted these standards in 2010” (2013). The Board of Regents is the governing body responsible for all NY educational activities, and in 2010 adopted a new curriculum known as the Common Core. The 2009-10

school year was the first year when this new curriculum was taught and was accompanied by large dips in proficiency rates in the state. In 2013, the state exams were updated to adhere to the newly adopted Common Core and scores once again dropped. While not necessarily definitive proof, it is difficult to attribute the drops seen in 2009-10 and 2012-13 to anything but the changes in statewide education policy.

Easily explained trends, however, are themselves not a trend. It becomes much more difficult to explain the behavior of proficiency rates when looking at the five districts. BCSD, UCSD, TCSD, NFSD, and SCSD all rank below state averages, and all have consistently done so since 2012-13. In the most recent school year, BCSD ranked as the worst performing district among the five in ELA and the second worst in math, ahead of only SCSD. And while SCSD has, historically, touted some of the worst scores since testing began in 1998-99, BCSD did not begin to underperform significantly until the 2009-10 school year. In fact, since testing standards were updated to the Common Core, the gap between BCSD and NY proficiencies has not only increased but has been growing. Across all the districts, it seems that updating testing standards inflicted immediate harm on student performance. In BCSD specifically, however, it seems that there has been long term stagnation as scores have barely managed to improve from 2012-13 to 2018-19 and have not improved at a rate anywhere close to the rate that NY averages have improved by.

This pattern of stagnation, unlike the immediate drops seen in 2009-10 and 2012-13, is not necessarily shared between the four other districts. NFSD and SCSD are similar to BCSD as the gap in performance, between district and state scores, has been increasing since Common Core was adopted. UCSD and TCSD differ from the others because the performance gap, while still

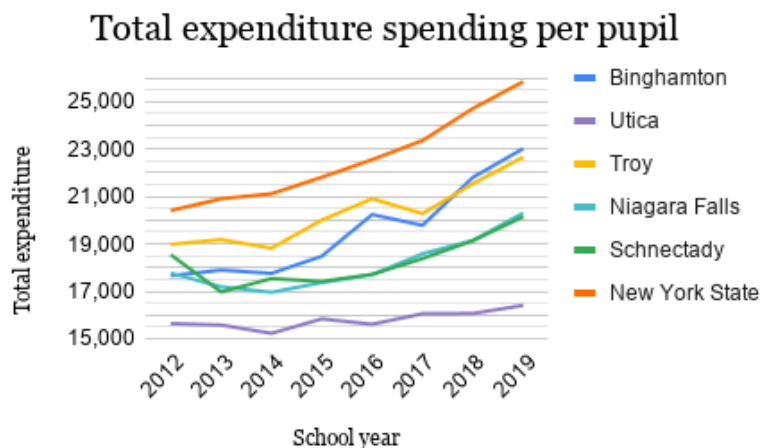
significant, has been decreasing over the years. This improvement is reflected in the overall scores in UCSD and TCSD as the two districts were the highest performers in both ELA in math among the five.

In summation, while all the districts remain behind the state in terms of performance, UCSD and TCSD are catching up, while BCSD, NFSD, and SCSD are falling further behind. Changes in educational policy in 2009-10 and 2012-13 correlated with statewide drops in proficiency and seemed to have universal, significant, long-term harm on the specified districts. In the most recent year, BCSD was the worst performing district of the group in ELA and the second worst performing district in math, ahead of only SCSD. In the same year, UCSD was the highest performing district in math, ahead of only SCSD. In the same year, UCSD was the highest performing district in math compared to the others and was second in ELA to TCSD. Two questions emerged from this analysis: Firstly, what characteristics did the five districts share that kept their proficiency so far behind the NY averages? And secondly, what characteristics did the districts whose scores were worsening share that were dissimilar to those districts that were improving?

Unexpected Trends in Expenditure Data

Figure 3

Graph of Per-Pupil Expenditures

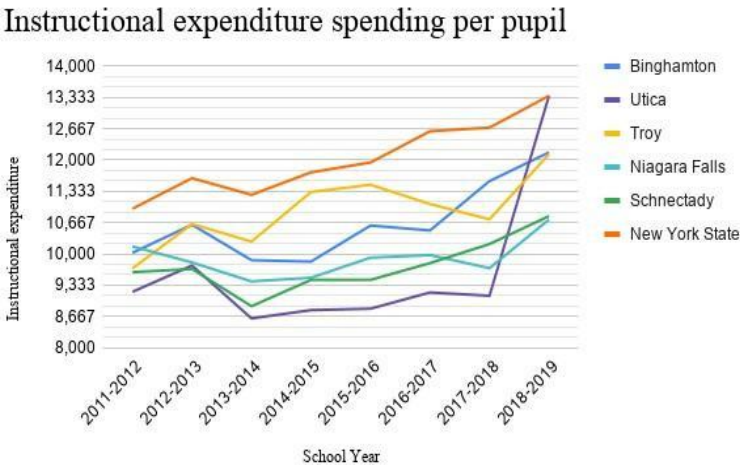


Results showed that Binghamton, one of the worst performers, had the highest rate of expenditure change from the years 2012 to

2018, with only New York State close behind. Utica increased by the least amount, despite being a higher educational performer. In calculating the sum of total expenditures added to the school budget from 2012 to 2018, Troy was found to have spent the most out of the counties, with Utica again spending the least. None of the districts came close to the total increase of New York State, consistent with their higher exam scores.

Figure 4

Graph of Per-Pupil Instructional Expenditures

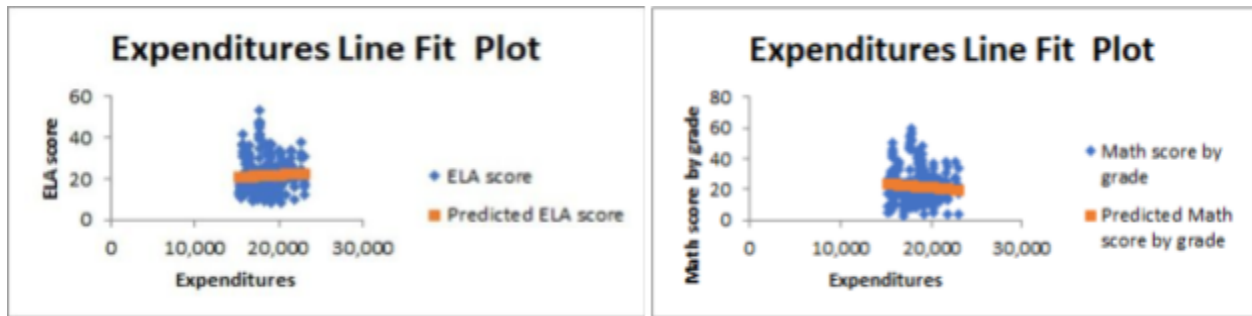


Trends show that the best performing district, Utica, had the highest instructional expenditure rate of change, while Niagara Falls had the lowest. In fact, in terms of instructional expenditures, none of the districts

nor New York came close to Utica’s 45% increase. Binghamton’s increase in instructional expenditures ranked 3rd for instructional increases, whereas Niagara Falls increased the least. Despite the large increases in total expenditures, only slightly above half was devoted to instructional expenditures for Binghamton and Troy. Around the same was true for the other counties, whereas Utica devoted more than half of its expenditures towards instruction.

Figure 5

BCSD Bivariate Regression Analysis of Exam Scores and Total Expenditures

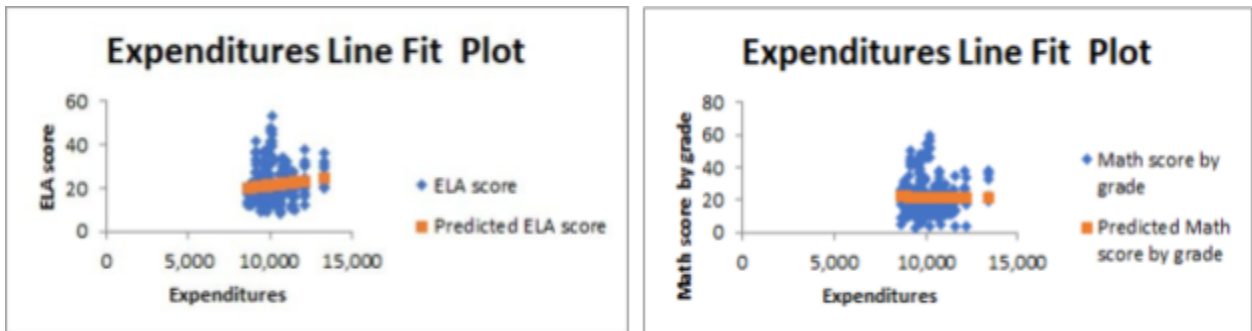


In BCSD, the bivariate analysis of average exam scores by total expenditure per pupil across the five districts reveals a P value of .0041 for ELA and .0169 for Math. Thus, as per pupil expenditures increase, math test scores decrease while ELA test scores increase slightly.

Figure 6

BCSD, UCSD, TCSD, NFSD, SCSD Bivariate Regression Analysis of Exam Scores and

Instructional Expenditures



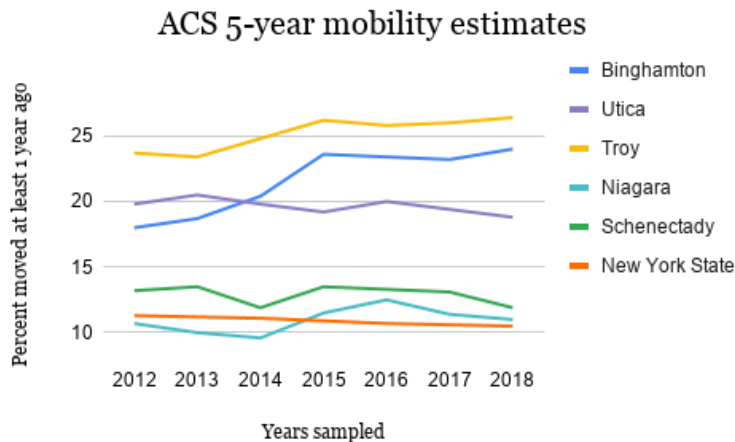
Conducted again but among the five school districts shows a P value of .00114 for ELA and .0000168 for Math. Replacing total expenditures with instructional reveals a P value of .0399 for ELA and .004 for Math. The relationship between exam scores and expenditures is stronger for total expenditures than it is for instructional. Increased expenditures demonstrate a relationship with increasing ELA scores but lower Math scores.

Non-definitive Mobility and Population Results

Binghamton’s rate of mobility increased the most, followed only by Troy. Schenectady and Utica’s mobility were negative, meaning greater numbers of residents were staying in their homes for more than a year than not, although every city experienced population loss. Thus, although Utica’s lesser amount of population loss correlates with higher exam outcomes, Schenectady—a lower performer—does as well. Binghamton received the largest drop in population, losing nearly 2,000 residents over the span of 6 years. Binghamton’s population drop corresponds to its academic underperformance, which supports our hypothesis. However, this is not true of other populations sampled, and is certainly not the main cause of underperformance in Binghamton. For instance, Utica’s population drop was similar to Binghamton’s, suggesting at a glance that population loss does not play a significant role in exam scores. It should be noted that mobility statistics reflect those of the cities at large and are not specific to the school districts.

Figure 7

Graph of Mobility Rates



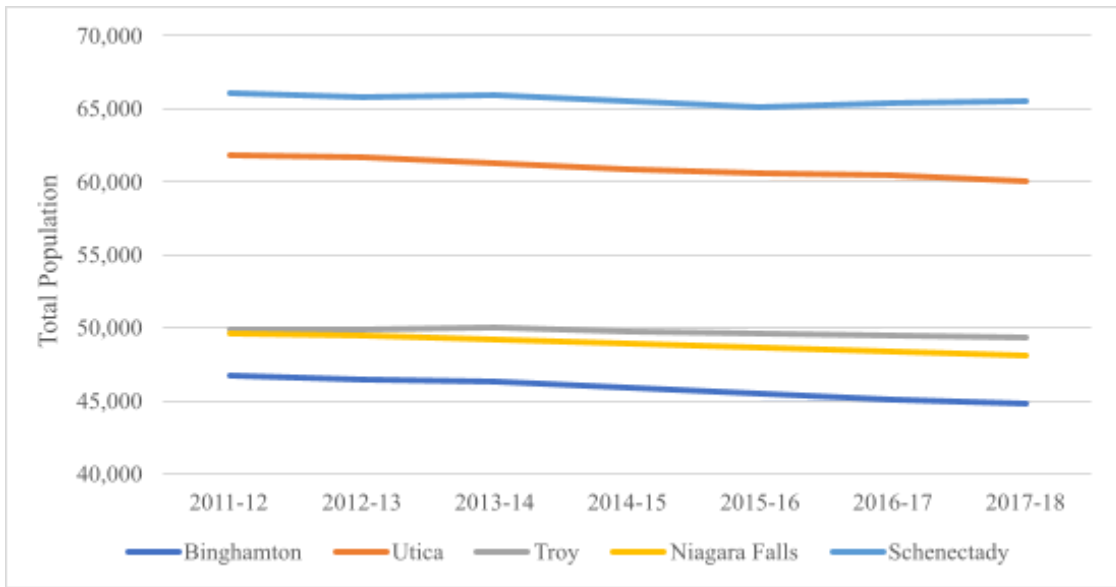
Interviews reveal that mobility in Binghamton impacts not only students, but schools and families. According to one member of the community, “New students are trying to catch up; their peers who

are not new are stalled waiting for their new peers to catch up, and teachers are constantly pressured to have all of them meet NYS benchmarks regardless of when they started in the classroom. Families are impacted because transiency is generally related to poverty and lack of resources, so they are perpetually stressed to balance home life and have little left to support the academic needs of their children. This often leads to disengagement, and even anger, between school staff and families. In the end, academic performance, school attendance, and ultimately graduation rates are impacted by high mobility” (2019).

An interview with a principal from one of the schools in BCSD reveals that the Binghamton area draws people in from all over. Once they regain economic stability, they leave. In the principal’s school alone, on average, they gain and lose 100 students in a year. “If I could make all families understand that school’s important, that would be huge,” the principal noted. “For some, it’s convenient for the parents to keep their kids at home, even to the point where some kids miss 50 days of school” (2019). One paper reported a mobility rate of 35% to 55% across elementary schools, and 30% across middle schools, although these numbers are not represented in any official database (New York State Education Department, 2016).

Figure 8

Graph of Total Population



Poverty, Absenteeism, and Enrollment

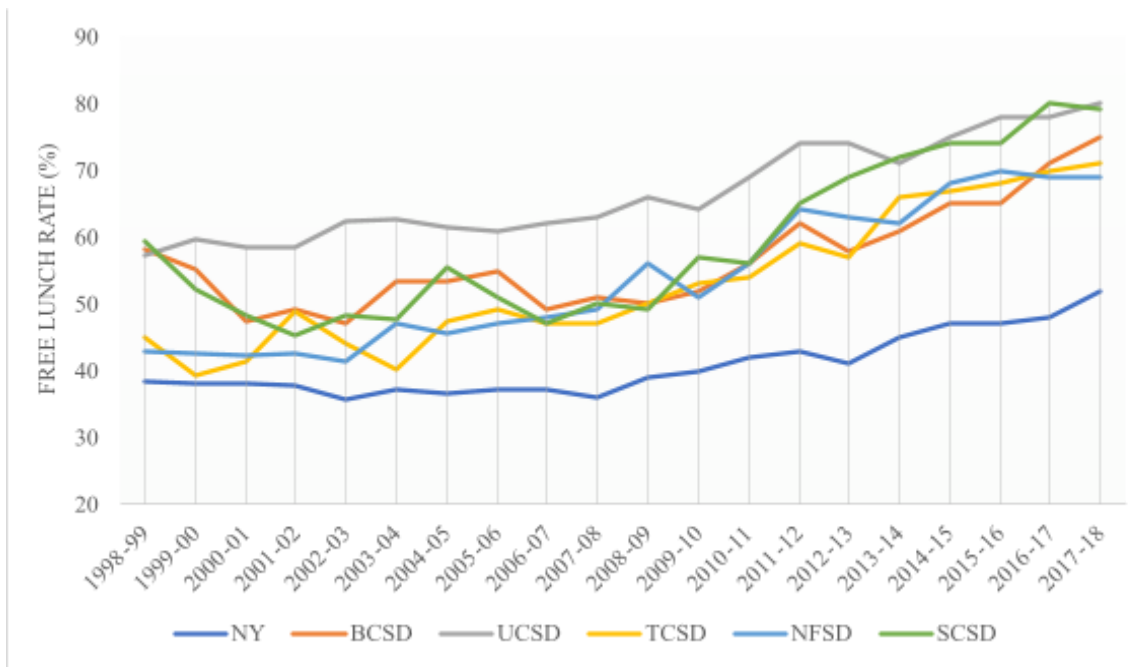
With expenditure data and population data leaving us with mixed results, we looked to NYSED for indicators of instability within the student body to better explain academic performance trends. We collected data on the percent of the student body that qualifies for free lunch, the percent of the student body classified as economically disadvantaged, attendance rates, and student enrollment for BCSD, UCSD, TCSD, NFSD, SCSD, and NY.

There is no Such Thing as a Free Lunch

A student qualifies for NY public education's free lunch program when their family's income is at or below 130% of the poverty line (NYSED, 2020). For a family of four, during the 2017-18 school year, an annual income of \$31,980 would qualify a child for free lunch. In that same year, 75% of BCSD students qualified for free lunch, which was the highest percentage in the entire span of time examined. In fact, in 2017-18 every single district and NY averages also had either their highest percentage of free lunch qualifying students or were one percentage point below their highest.

Figure 9

Graph of the Percent of the Student Body Qualified for Free Lunch



Statewide, there has been a universal increase in students qualifying for free lunch, but there has not been a universal rate of qualifying students. All five of the selected school districts have rates far above the NY baseline—the smallest of those differences, in the most recent school year, being 17 percentage points in NFSD. So, while poverty—or rather 130% of poverty—may be increasing across the state, it disproportionately affects the given districts.

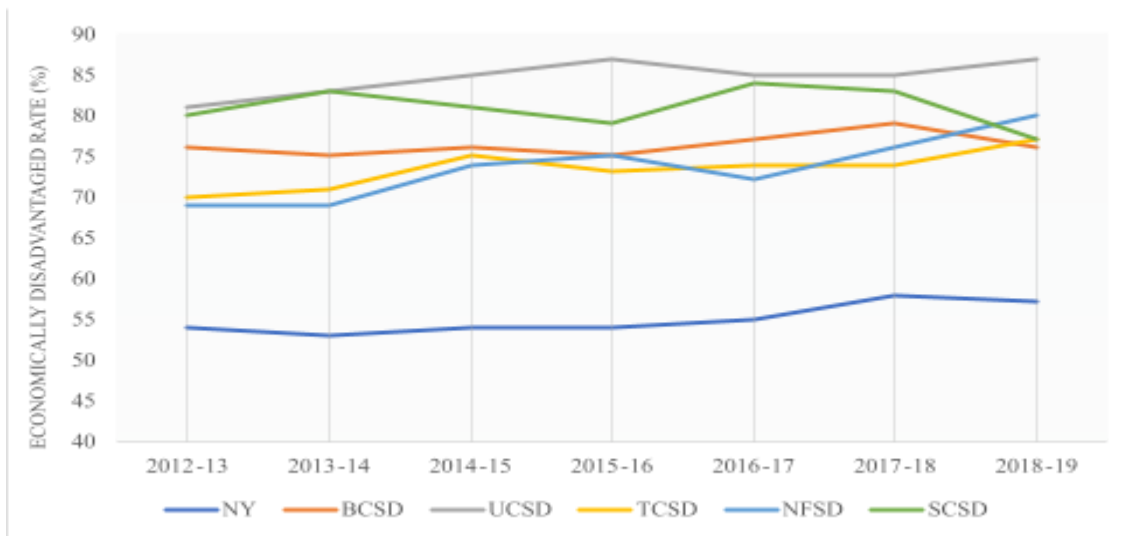
With this, we find another characteristic the districts share with each other. And, unlike with spending, the spread of data between the districts is tight, as can be seen in figure 9. In 2017-18, NFSD’s rate of qualifying students of 69% was only 11 percentage points behind UCSD’s rate of 80%. While this difference is not insignificant, it offers an explanation behind the underperformance of the five districts. BCSD, UCSD, TCSD, NFSD, and SCSD all share a

pattern of below average academic proficiency and share a pattern of above average rates of poverty.

The districts’ struggles with poverty can be seen further in the data collected on the percent of the student body classified as economically disadvantaged. The qualifications for an economically disadvantaged student are more encompassing than qualifications for free lunch. According to NYSED, “Economically disadvantaged students are those who participate in, or whose family participates in, economic assistance programs, such as the free or reduced-price lunch programs, Social Security Insurance (SSI), Food Stamps, Foster Care, Refugee Assistance (cash or medical assistance), Earned Income Tax Credit (EITC), Home Energy Assistance Program (HEAP), Safety Net Assistance (SNA), Bureau of Indian Affairs (BIA), or Family Assistance: Temporary Assistance for Needy Families (TANF)” (2019).

Figure 10

Graph of the Percent of the Student Body Classified as Economically Disadvantaged



The additional guidelines included with the economically disadvantaged classification have the potential to reveal characteristics of the districts. As can be seen in figure 10, all five have higher rates of economically disadvantaged students than the state average. The lowest rate, in 2018-19, actually comes from BCSD with 76%, but that is still 19 percentage points above the NY average of 57%. UCSD, just as it did with free lunch students, has the highest rate of economically disadvantaged students out of all the measured districts. However, there are points where the two graphs diverge from each other

In 2017-18, the last year that free lunch data is available, the difference between the districts with the lowest and highest rates of economically disadvantaged students remains the same in both data sets, with UCSD and TCSD being separated by 11 percentage points. But instead of NFSD ranking as the least poverty-stricken district, as it does in the free lunch data, TCSD overtakes it as the “richest” of the measured districts. UCSD and TCSD are the highest performers on the proficiency exams, yet are extremes, opposite of each other in the data of economically disadvantaged students.

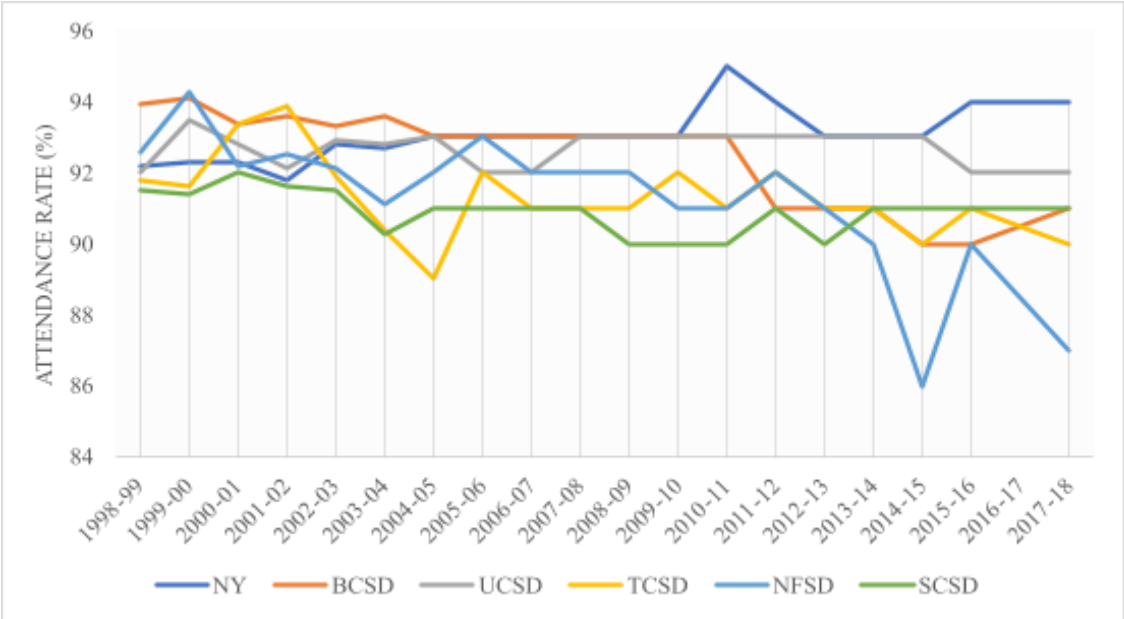
Therefore, the disproportionately high rates of free lunch qualifying and economically disadvantaged students in the five districts may be able to explain the general underperformance, but these rates do not offer definitive explanations on the nuances of that underperformance. UCSD, by these metrics, has the poorest student body of the districts. But in the 2018-19 school year, out of all the districts UCSD students were proficient at the highest rate in math and second highest in ELA. Meanwhile, BCSD students were economically disadvantaged at the lowest rate in 2018-19 yet posted the worst ELA scores and second worst math scores. While poverty is a

factor in the exam scores, it is not the only factor. And it is not the ultimate, differentiating factor between the districts.

A Puzzle Named Attendance

Figure 11

Graph of Annual Attendance Rates



For every school year, except the most recent, NYSED has released an annual attendance rate to accompany its exam data. Attendance rate is calculated by dividing the total number of days of student attendance by the total number of days of student enrollment.

As can be seen on figure 11, annual attendance rates have remained relatively consistent since 2005-06. Over that span of time, rates in BCSD, UCSD, TCSD, SCSD, and NY fluctuated by only 1 or 2 percentage points, a pattern that NFSD was a notable exception to. Over the same time period, NFSD attendance rates dropped from 93% to 87%, and reached a low point in 2014-15 with a rate of 86%.

While the differences between the districts appear small—in most cases only 1 or 2 percentage points—they coincide with much larger gaps in the measure that NYSED calls elementary/middle chronic absenteeism for 2017-18. A chronically absent student is one that misses at least 10% of enrolled instructional days. Chronic absenteeism rates are broken into two categories: elementary/middle, for grades K-8, and secondary, for grades 9-12.

Figure 12

Table of Chronic Elementary/Middle Absenteeism Rates

Year	NY	BCSD	UCSD	TCSD	NFSD	SCSD
2017-18	15	28.7	24.5	35.5	41.8	27.3
2018-19	15.6	26.1	23	29	41.6	28.6

Figure 13

Table of Chronic Secondary Absenteeism Rates.

Year	NY	BCSD	UCSD	TCSD	NFSD	SCSD
2017-18	23.2	31.9	35.4	32.3	67.8	35.3
2018-19	24.5	46.5	31.9	33.2	64.1	36.9

On the elementary/middle level, the distribution of chronic absenteeism rates is similar to the distribution of annual attendance rates. NFSD has both the highest rate of chronic absenteeism and the lowest rate of annual attendance in 2017-18. UCSD has both the lowest rate of chronic absenteeism and the highest rate of annual attendance. The districts in between NFSD and UCSD in chronic absenteeism organize themselves in order of their annual attendance rates.

In the 2017-18 school year, annual attendance rate and chronic absenteeism line up succinctly. Unfortunately, this pattern doesn't translate as cleanly to rates of secondary chronic absenteeism, and there is no available data on annual attendance rate for the 2018-19 school year or data available on chronic absenteeism rates prior to 2017-18, so there are no other years of corroborating data to verify the trend seen on the elementary/middle level.

In terms of exam scores, attendance remains a considerable factor. NFSD has the highest chronic absenteeism rates and has difficulty improving its scores, while UCSD has some of the lowest chronic absenteeism rates and has been able to promote improvement. It is important to note, however, that when thinking about how attendance may impact exam scores, we must recognize that attendance is itself impacted by additional factors, including poverty and family life. Our interviews revealed that, in BCSD, it is convenient for some parents to leave their kids at home. At the same time, according to one of our interviewees, BCSD pushes the kids to advocate for themselves in attending school. "We put it on the kids because I feel like if kids are [saying] 'Mom, I gotta go to school,' they're more likely to come to school" (2019). During the earlier years of a student's education, the parent plays a much larger role in ensuring their child attends school regularly and on time. High rates of chronic absenteeism on the elementary/middle level may point to a lower degree of parent engagement as students at the elementary/middle level often lack the autonomy to habitually skip class. It is possible that the higher the annual attendance rate, or the lower the chronic absenteeism rate, the more involved the average parent is—even in a seemingly indirect way. With that thinking, the question becomes less about how attendance affects exam scores, and more about how parent involvement affects exam scores. At the extremes, in NFSD and UCSD, we can say the level of

parent engagement seems to have an impact on student performance, but that impact does not occur to the same degree in all of the districts. Of course, as has become increasingly common throughout the course of the project, attendance rates do not offer a complete explanation on the differences between the districts. Nor can we definitively say that parent engagement is the only factor in attendance rates.

Total Enrollment Follow Population Trends... Except?

Figure 14

Graph of Total K-12 Enrollment

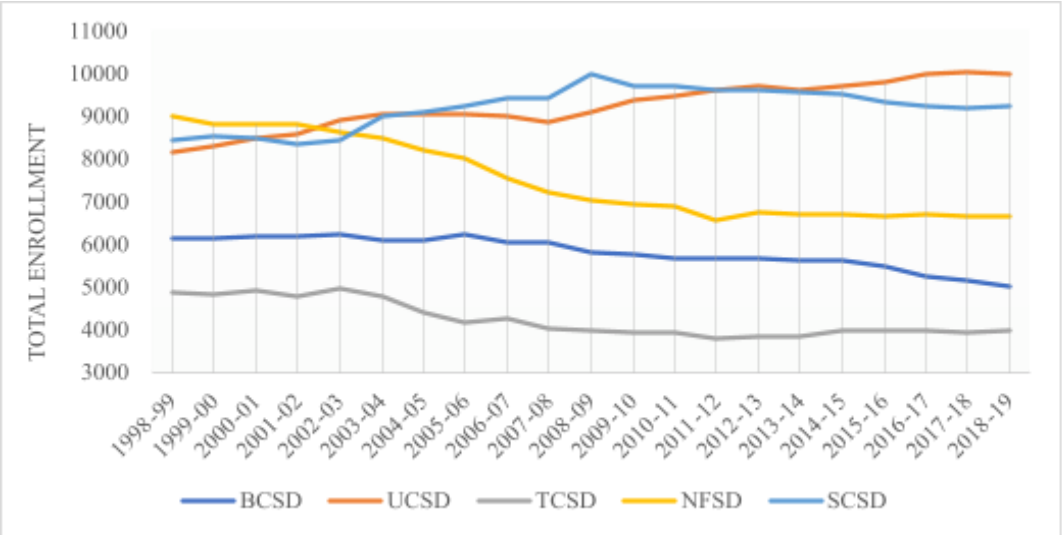
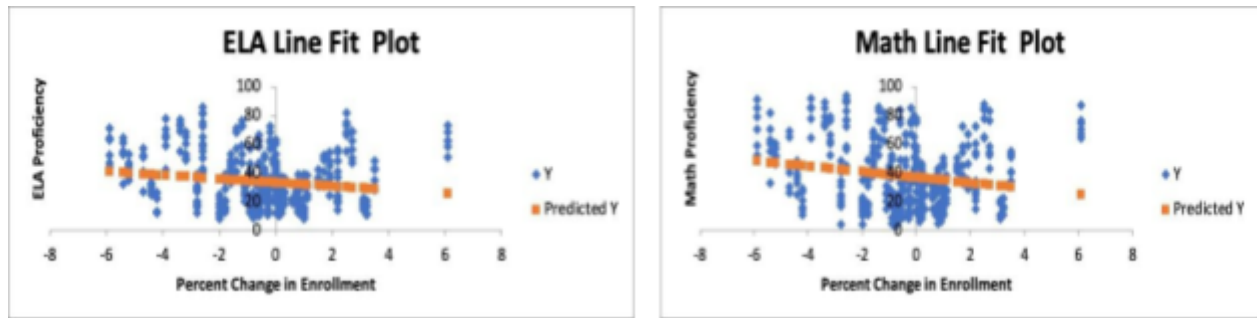


Figure 14 contains total enrollment data for each of the five districts. Just as it did in the total population data, enrollment for BCSD, NFSD, and SCSD has been falling since 2011-12. However, in both UCSD and TCSD, it has risen. Granted, these increases are small, but with TCSD and NFSD showing increases in enrollment and improvements in test score, while the others showed the opposite, we wanted to see if there was a link between the two variables. Another bivariate regression analysis was conducted.

Figure 15

Bivariate Regression Analysis of Exam Scores and Percent Change in Enrollment



With P-values of $1.37E^{-131}$ for the ELA graph and $1.04E^{-113}$ for the math graph, the lines predicted by the bivariate regression analysis indicate a strong relationship between exam scores and percent change in enrollment. Interestingly, increases in enrollment are shown to decrease scores while decreases in enrollment are shown to increase scores. This finding seems counter to what the graph of total enrollment shows, as the two districts that have seen increases in total enrollment also experienced the more significant increases in scores.

When considering the data input into the bivariate regression, our findings here may support the claims made in our interviews. Percent change in enrollment was calculated on a yearly basis and corresponded with scores in the given year. The results show us that instances of increased enrollment, on a yearly basis, correlate to lower scores. The question then becomes: where do these increases come from if most of our districts are seeing their enrollments decrease and all are seeing their populations decrease? Is it possible these increases are instances of transfers? Transfers that enter the district's school system, lower the overall scores, and then leave soon after? Both the BCSD principal and upper-level official cited mobility within the student population as a massive hindrance. The results of the bivariate regression analysis,

conducted above, could be used as support for that sentiment if we were to view increases in enrollment as transfer students.

And while that may certainly be a possibility, it is difficult to prove with any of the other data available to us. It is nearly impossible to map the nuances of the losses and gains in each of the district’s population or enrollment. We have almost no way of knowing when losses are losses of new students or of established students; when gains in students are from fresh transfers or from children already in the community. So, while interesting, these results offer nothing definitive.

Comparison of Community and School Factors Among Utica and Binghamton

Despite their differences in exam scores, Utica and Binghamton are most similar in community factors. Although Binghamton boasts greater poverty rates, it only exceeds Utica by a slim margin. Median income, value of homes, employment, and housing rates might be higher for Utica, but not by a significant amount.

Figure 15

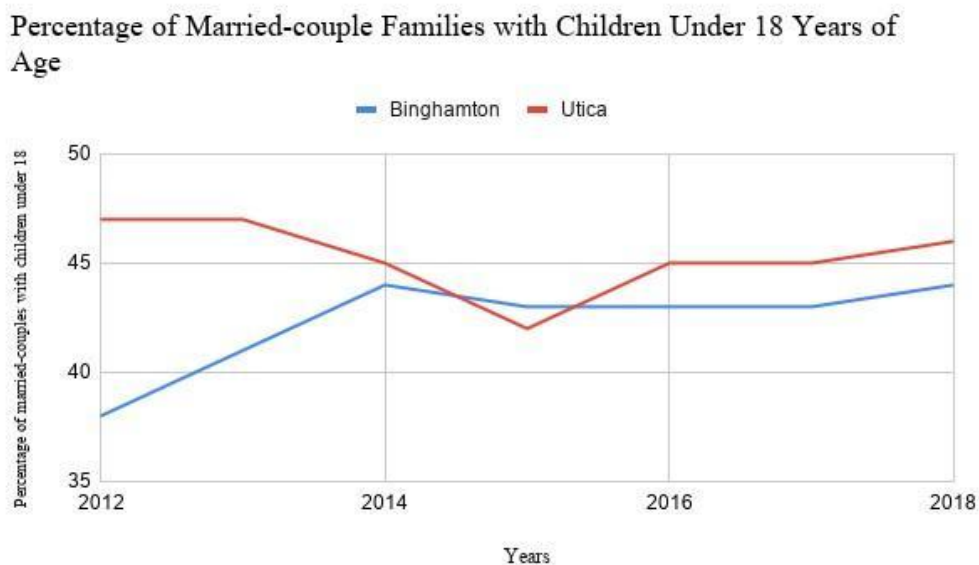
Community measurements

<i>Median values of community measurements</i>		
<i>2014-2018</i>	<i>Binghamton</i>	<i>Utica</i>
<i>Income</i>	<i>\$31,905</i>	<i>\$35,394</i>
<i>Value of homes</i>	<i>\$89,400</i>	<i>\$90,700</i>
<i>Poverty rate</i>	<i>33.2</i>	<i>30</i>

<i>Civilian employment 16 years and older rate</i>	56.1	58
<i>Owner occupied housing unit rate</i>	43.2	47.8

Figure 16

Percentage of Married Couple Families with Children Under 18 Years of Age

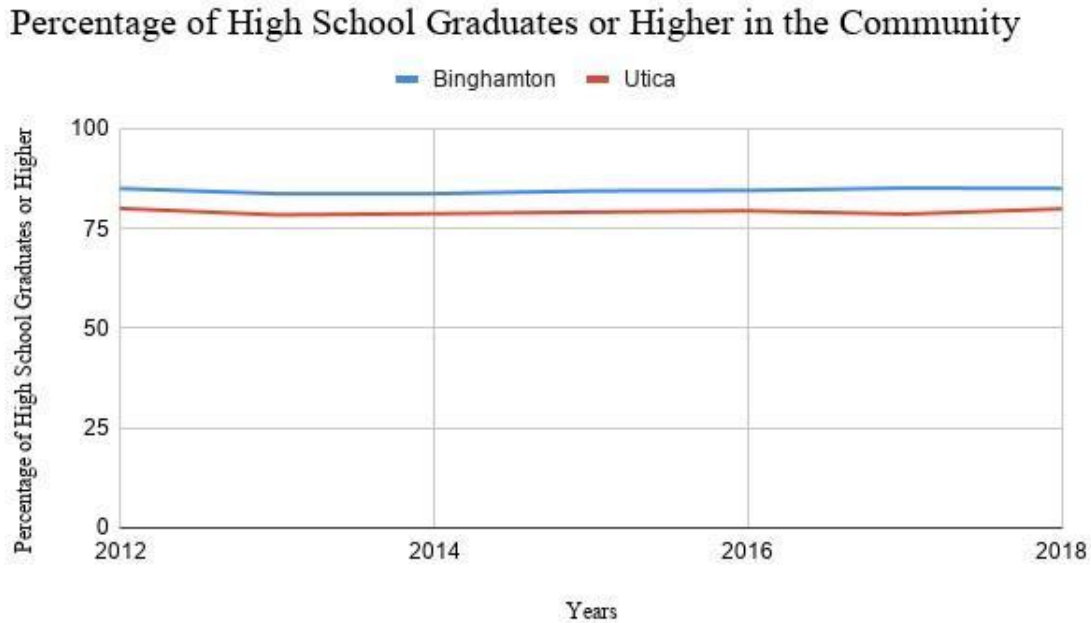


Binghamton and Utica are similar in their percentage rates of married couples living with children under 18 years of age, although Binghamton experienced a rise from 2012 to 2014, and both have near identical percentages of residents 25 years of age and older having graduated from high school. A low percentage of married-couples living with children under 18 years of age--calculated by dividing married couples with children under 18 by total families--might have indicated more instability in the community, and although the rate is barely 50%, they are not substantially different. Moreover, a low percentage of high school graduates might indicate a

lower-income, more working-class community, but the rates have held constant over 6 years and do not demonstrate differences among Utica and Binghamton in that regard.

Figure 17

Percentage of High School Graduates or Higher 25 Years and Older in the Community



Questions Answered and Further Research

Our hypothesis, which is that higher rates of mobility are the main factor impacting exam grades in BCSD, is supported by a positive correlation between mobility and academic performance trends. However, this hypothesis cannot be applied across all districts, and nor can we point to a definitive factor that influences academic outcomes. While mobility may be a factor in academic outcomes, it may only hold true if coupled with other variables. Interviews and various reports reference mobility as a legitimate concern in BCSD, but it is possible that mobility aggravates other issues in the district that altogether bring exam scores down. More

research needs to be conducted on student mobility, which may differ vastly from community mobility, and the relationship they share with other socioeconomic factors.

Moreover, comparison between Utica, the highest-performing school district, and Binghamton, does not offer substantial evidence that any of our chosen community or school factors play a major role in exam scores. Concurrent with the literature, a student's immediate surroundings may outweigh the effects of community and school factors (Alvarez et al., 2009; Finigan-Carr & Shaia, 2018; Körne, 2016; Mendels, 2012; Simpsons & Fowler, 1994). As stated before, more research needs to be conducted on the home lives of students, which has been found to be the best predictor of academic success (Altschul, 2011; Majumder, 2015). Measurements of student security, family support, parenting style, and familial relations with the community, should all be considered.

Research conducted on the rates of free lunch qualifying students, economically disadvantaged students, and attendance point to poverty and parent engagement as influential factors in district performance. The overall poverty trend among the cities and the student body in comparison to New York State is confirmative of past research that community and individual poverty have major, negative impacts on academics (McLord, 1998). Yet, our research suggests that poverty may play an influential role only to an extent, as mentioned in the analysis between Utica and Binghamton. More research needs to be conducted on the racial, criminal, political, and economic demographics of the discussed areas. While our research suggests underlying influence on exam scores, more must be learned about the factors that would augment or deter the impact of poverty and parent engagement before any definitive claims are made.

BCSD once again deviates from the trend in terms of expenditure data and academic outcomes. Our bivariate analysis reveals that, although all districts increased ELA scores with increased total expenditures, BCSD increased only slightly. However, BCSD does follow suit with our findings that increasing total expenditures does not predict better math scores. Interestingly, total expenditures have more of an impact on exam grades than instructional expenditures. Possible explanations include differences in the multiple ways expenditures are used. Since total expenditures apply to a wide array of subjects, funding could be diverted to construction or administrative salaries. In addition, total expenditures may be providing vital services that benefit students more than funding through instruction is able to. One of our interviews alluded to the benefit of funding school services beyond only instruction, for instance in BCSD there was a need for more social workers. Since no data on the breakdown of expenditures in each district exists, we can only speculate. However, we can assume that total expenditures are not funding services that benefit students scoring below proficiency on the math exam scores. Further research must be sought on the instructional methods involved in teaching students in areas tested by ELA and math exams. While we maintain that adhering to policies such as those recommended by the CDC for connection, engagement, and sustainment may help students affected by lack of parental involvement, those should be secondary to policies focusing on assisting students with math, and to a lesser extent, English. This may be through making tutoring available to those who need it, smaller class sizes, greater variety in math and English classes, or a re-evaluation of the curriculum altogether.

A couple things should be noted. Exam scores should not be assumed to be the sum of a student's academic abilities. Although GPA may offer an alternative mode of measurement for

future research, the ability of a student to learn and master material in school may not always be defined by numerical data. With the changes made to educational policies in the 2009-10 and 2012-13 school years, students in the five districts were impacted in a manner disproportionate to many of their peers throughout the state. There is no doubt that this is no fault of the students in BCSD, UCSD, TCSD, NFSD, or SCSD. The decreases seen in those years, and the subsequent, long-term underperformance is a result of the student's social, familial, and educational environment. The adoption of the Common Core has had unintended, harmful consequences to the education system of the students in the five districts. Current testing policy has not allowed most of the districts to improve their scores to a great degree and has not allowed any of the districts to catch up with NY averages.

In line with this, any conclusions drawn from our research pertains to low-income school districts and may not be predictive for more affluent communities. Moreover, a vital part of our research was cut off because of the development of COVID-19. We had prepared a survey to distribute among a chosen school in BCSD to better gauge mobility estimates and the home lives of students. This would have been beneficial for more accurate student mobility rates and for measuring the impact of home-life. Granted, it would have been difficult to administer similar surveys to other school districts, but it would have offered greater insight into BCSD. We had also created a survey for parents to understand their thoughts and feelings about topics including mobility, home stability, and the school district.

There are multiple possibilities for future research besides the need for student surveys and alternative measurements of academic achievement. First, researching each individual school in BCSD might offer insight into detailed issues which affect academics. It may be that

only a couple schools in particular are underperforming and, therefore, bringing the average exam scores down. Moreover, student poverty and other factors might be a greater issue for some schools than others. Mapping the roster turnover in each of the schools and districts would offer a more complete view of mobility in the student body. Variables that were indicated to have some influence on exam scores, in this study, require more extensive methods to prove any definitive correlations.

In conclusion, the contents of this project have provided enormous insight into BCSD as a whole. The collection of data and discussion conducted is pertinent for establishing a baseline understanding of BCSD, but to further uncover what sets the Binghamton City School District apart from the other districts would require additional, in-depth study.

References

- Anthony, B. (2019). Broome County overdose fatalities surpass 2018, mostly due to March Spike in deaths. *Pressconnects*. Retrieved from <https://www.pressconnects.com/story/news/public-safety/2019/10/08/broome-fatal-drug-overdoses-fentanyl-opioids/3908650002/>
- Altschul, I. (2011). Parental involvement and the academic achievement of Mexican American youths: what kinds of involvement in youths' education matter most? *Social Work Research, 35*(3), p. 159-170.
- Alvarez, M., Bye, L., Partidge, J., & Shephard, M. (2009). School Social Work Outcomes: Perspectives of School Social Workers and School Administrators. *Children & Schools, 31*(2), 97-98.
- Balslev, G., Gibson, J., Miller, P., & Scanlan, M. (2012). Looking beyond Harlem: International insights for area-based initiatives. *Middle School Journal, 44*(1), pp. 16-24. DOI: 10.1080/00940771.2012.11461835
- Binghamton City School District: An Education Services Analysis. (2015). *Futures Education*. Retrieved from http://www.binghamtonschools.org/UserFiles/Servers/Server_512723/File/About/Departments/Curriculum%20and%20Instructions/Students%20with%20Disabilites/Special%20Education%20Services%20Analysis%202015.pdf
- The Binghamton City School District. (2019). *BCSD 19-20 Budget Transparency Parts A-E*.

Retrieved from

http://bcsd1.ss14.sharpschool.com/board_of_education/School%20Budget/NYSED%20Financial%20and%20District%20Reports

Center for Disease Control and Prevention. (2012). *Parent Engagement: Strategies for Involving Parents in School Health*. Retrieved from

https://www.cdc.gov/healthyschools/parentengagement/pdf/parent_engagement_strategies.pdf

The City of Binghamton Mayor's Office. (2008). *Promotion of Home Ownership in the City of Binghamton: A Report of the Mayor's Commission on Housing and Home Ownership*.

Retrieved from

www.binghamtonny.gov/sites/default/files/files/Commission%20on%20Housing%20%26%20Homeownership%20-%20Final%20Report.pdf

Cizek, G., Crandell, J., Hirsch, T., & Trent, E. (2001). A Preliminary Investigation of Pupil Proficiency Testing and State Education Reform Initiatives. *Educational Assessment*, 7(4), 283-302. DOI: 10.1207/S15326977EA0704_03

Cutler, D., & Llaris-Muney, A. (2006). "Education and Health: Evaluating Theories and Evidence." *Working paper series (National Bureau of Economic Research)*, 12352(1), 1-6.

Darling-Hammond, L. (2011). Soaring Systems. *American Educator*, 24(1), 24-33. Retrieved

from

<https://pdfs.semanticscholar.org/6f4a/4620d88df56ef3d750110226c3eee5019918.pdf>

Egalite, Anna J. (2019, 4 June). How Family Background Influences Student Achievement. *Education Next*, Retrieved from

www.educationnext.org/how-family-background-influences-student-achievement/.

- Elango, S., García, J., Heckman, J., Hojman, A. (2015). Early Childhood Education. *IZA Discussion Paper* no 9476, 49-56.
- Farooq, M. (2011). Factors affecting academic performance of students: A case of secondary School level. *Journal of Quality and Technology Management*, 7(2) 1-14.
- Finigan-Carr, N. & Shaia, W. (2018). School social workers as partners in the school mission. *Phi Delta Kappan*, 99(7), 26-30.
- Giani, M., Alexandar, C., & Reyes, P. (2014) Exploring Variation in the Impact of Dual-Credit Coursework on Postsecondary Outcomes: A Quasi-Experimental Analysis of Texas Students. *High School Journal*, 97(4), 200–218
- Körne, G. (2016). Mental Health Problems in a School Setting in Children and Adolescents. *Dtsch Arztebl Int*, 113(11).
- Häkkinen, I., Kirjavainen, T. & Uusitalo, R. (2003). School resources and student achievement revisited: new evidence from panel data. *Economics of Education Review*, (22)3, 329-335.
- Halawah, I. (2006). The effect of motivation, family environment, and student characteristics on academic achievement. *Journal of Instructional Psychology*, 33(2), 91-97.
- Hanushek, E. (2003). The Failure of Input-Based Schooling Policies. *The Economic Journal*, 113(485), 64-98.
- Joseph, B. Retrieved from <https://wnbf.com/martinez-not-terribly-surprised-by-teachers-reaction/>)

- McLard, V. (1998). Socioeconomic disadvantage and child development. *American Psychologist*, 53(2), 185–204.
- Majumder, A. (2015). The Impact of Parenting Style on Children’s Educational Outcomes in the United States. *Journal of Family and Economic Issues*, 37(1), 89-98.
- Mendels, P. (2012). The Effective Principal: Five Pivotal Practices that Shape Instructional Leadership. *The Journal of Learning Forward*, 40(5), 1-4.
- Moldt, S. (2016). Making the Grade: A ground-level analysis of New York State’s teacher performance review under the APPR. *Brigham Young University Education and Law Journal*, 2016(2), pp. 217-262. ISSN: 1930-5273
- National Center for Education Statistics. (2019). *Fast Facts*. Retrieved from <https://nces.ed.gov/fastfacts/display.asp?id=66>
- NCES (2019). *Search for Public School Districts*. Retrieved from https://nces.ed.gov/ccd/districtsearch/district_detail.asp?ID2=3604870.
- New York State Department of Education. (2019). *New York State Education Data*. Retrieved from <https://data.nysed.gov/>
- New York State Education Department. (2016). *Local Education Agency 1003(g) school l Improvement Grant Application, 2016*. Retrieved from <http://www.p12.nysed.gov/oisr/Binghamton%20CSD%20-%20East%20Middle%20SIG-g%20App%207-20-16.pdf>

New York State Education Department (2019). *SIRS-107 Chronic Absenteeism Accountability Report Level 2 Reporting (L2RPT) Report Guide*. Retrieved from <http://www.p12.nysed.gov/irs/sirs/home.html>.

New York State United Teachers. (2019). *State must immediately fix New York's flawed 3-8 exams*. Retrieved from <https://www.nysut.org/news/2019/april/state-must-immediately-fix-new-yorks-flawed-3-8-exams>

Nieuwenhuis, J., & Hooimeijer, H. 2016. The association between neighborhoods and educational achievement, a systematic review and Meta-analysis. *J House Built Environ*, 31(2), 321-347

Oakes, Jeannie, et al. (2017, 5 June). *Community Schools: An Evidence-Based Strategies for Equitable School Improvement*. [Brief]. Retrieved from <http://nepc.colorado.edu/publication/equitable-community-schools>.

The Office of the New York State Comptroller. (2016). *Audit of the City of Binghamton*. Retrieved from <https://www.osc.state.ny.us/localgov/audits/cities/2016/binghamton.pdf>

Quinn, Patrick & Duckworth, Angela. (2007). Happiness and Academic Achievement: Evidence for Reciprocal Causality. Poster Presented at the Annual Meeting of the American Psychological Society. Vol. 4.

Raymond, P., Reinhard, P., Thomas, G., & Wolfram, T. (2002). Positive Emotions in Education.

FRYDENBERG, Erica, ed. *Beyond coping: Meeting goals, visions, and challenges*, 149-173

Reardon, S., (2013). The Widening Income. *Educational Leadership*, 70(8), 10-16. ISSN: 0013-1784.xx`

Simpsons, G., & Fowler, M. (1994). Geographic Mobility and Children's Emotional/Behavioral Adjustment and School Functioning. *Pediatrics February*, 93(2), 303-309

Social Explorer (2018). *ACS*. Retrieved from https://www.socialexplorer.com/tables/ACS2018_5yr/R12440480

Stebbins, Samuel. (2019). These 25 Cities are Losing More than they are Gaining as Population Declines. *USAToday*. Retrieved from <https://www.usatoday.com/story/money/economy/2019/03/21/population-decline-us-cities-losing-most-residents/39199277/>

Stern, G. (2019). New York state exams: Here's what the latest results show for students. *Pressconnects*. Retrieved from <https://www.pressconnects.com/story/news/education/2019/08/22/new-york-state-examsheres-what-latest-results-show-students/2084422001/>

The United States Census Bureau. (2019). *U.S. School Spending Per Pupil Increased for Fifth Consecutive Year, U.S. Census Bureau Reports*. Retrieved from <https://www.census.gov/newsroom/press-releases/2019/school-spending.html>

The United States Department of Education. (2019). *National Assessment of Educational Progress*. Retrieved from <https://nces.ed.gov/nationsreportcard/>

Valiente, Carlos, et al (2012, June). Linking Students' Emotions and Academic Achievement: When and Why Emotions Matter. *Child Development Perspectives*, 6(2), 129-135.

Wotherspoon, T., (2004). Education as Public Place and Inclusive Space. *Education Canada*,
44(1), 12-51. ISSN: 0013-1253.