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Understanding the Relationship between Teacher Turnover and Student Success Across Ethno-Racial and Socioeconomic Demographics: An Analysis of Massachusetts Public Schools

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UNDERSTANDING THE RELATIONSHIP BETWEEN TEACHER TURNOVER AND STUDENT SUCCESS ACROSS ETHNO-RACIAL AND SOCIOECONOMIC DEMOGRAPHICS: AN ANALYSIS OF MASSACHUSETTS PUBLIC SCHOOLS

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

The current study aims to discover if there is a correlation between teacher turnover and student achievement in Massachusetts' public schools across student demographics and school type. The U.S. is experiencing a teacher crisis in which teachers are choosing to leave schools at an alarmingly high rate, and researchers debate whether this is having an impact on student achievement and if it is, if this impact is positive or negative. This study looks closely at eight public school districts in Massachusetts in both urban and suburban regions. Specifically, researchers will observe the relationship between teacher retention during the 2016, 2017, and 2018 school years, in comparison with the subsequent student test scores on the Next-Generation MCAS state standardized test during the years 2017, 2018, and 2019 across these districts. Researchers hypothesize that teacher turnover will result in a negative impact on student achievement, and that this impact will be more significant for students of color and students of low-socioeconomic status (SES).

The United States is in the midst of a teacher crisis in which teacher turnover is reaching an alarming rate across the nation. Researchers have found that of the teachers leaving annually, the majority of them are doing so of their own volition. The number of teachers leaving the profession annually has increased gradually over the past several years. During the late 1980s and early 1990s, U.S. attrition was at less than 6% (Sutcher et al., 2016). However, between 1989-2005 this percentage increased by 50% (Sutcher et al., 2016). According to scholars Carver-Thomas and Darling-Hammond (2019), between the school years 2011-2012 and 2012-

2013, 16% of teachers were moving schools and leaving the profession annually. Of this 16%, 37% are voluntarily moving between schools and 30% are voluntarily leaving the profession, leaving 18% to retirement and 14% to involuntary leavers (Carver-Thomas & Darling-Hammond, 2019). The national average turnover rate between the years 2015-2018 was at approximately 16% and remains hovering at this percentage to date ("Teacher and Principal Turnover," 2019, "Results from the 2020," 2020).

Existing literature on this issue states that there are a wide range of circumstances which lead teachers to moving or leaving. Many researchers have found consistent themes in teacher-reported burnout, including insufficient salary, lack of administrative support and/or respect, lack of professional prestige, and the pressures of federal and state mandates (Wynn et al., 2007; Hughes, 2012; Wronowski, 2017). Though there is a myriad of existing research on teacher turnover, there remains a debate among scholars on the impact this rampant turnover has on the academic achievement of students.

The purpose of the current study is to determine if these high rates of teacher turnover are having an impact on student achievement on state standardized tests. Massachusetts, having one of the lowest turnover rates in the nation, retained 87.5% of its teachers during the 2018-2019 school year (www.doe.mass.edu/statereport/staffingRetentionRates, 2019). However, losing 12.5% of 63,632.2 teachers equates to approximately 7,954 teachers who felt the need to move schools or leave teaching as a profession. This study aims to understand the relationship between teacher turnover and academic outcomes across various ethno-racial groups and socioeconomic statuses (SES). Urban districts in any state typically involve more bureaucracy than smaller suburban districts while also serving some of the most underprivileged students in any state (Jacob, 2007). Working with different demographics, varying district resources, and different

school/district cultures, teachers in urban and suburban schools are likely to face different challenges, and students may respond to changes in staffing in different ways.

It is imperative that policy makers and administrators understand the impacts of this crisis across district regions and student demographics. This research will give policy makers and school officials a clearer understanding of the impacts of turnover on student achievement so they may accumulate the information necessary to ensure the equitable distribution of teachers and resources across the state's urban and suburban districts.

To first construct an understanding of the issue of teacher turnover, the literature review will consider much of the existing research on turnover and its documented impacts to date on urban and suburban public-school systems. Such research will include conflicting perspectives of the impact of turnover on student achievement. This view of the existing conversation and present inequities among student demographics in urban and suburban schooling guides and focuses the first research question for the current study on turnover in Massachusetts public schools; "How is teacher turnover in urban and suburban public-school districts in Massachusetts associated with student achievement on the Next-Generation MCAS state standardized test?," and its sub-questions: (a) "How is teacher turnover in urban and suburban public school districts in Massachusetts associated with the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS state standardized test?," and (b) "How is teacher turnover in urban and suburban public school districts in Massachusetts associated with the achievement of students who are economically-disadvantaged and non-economically disadvantaged on the Next-Generation MCAS state standardized test?" By collecting annual teacher retention data and student test score data, available to the public by the Massachusetts Department of Education, this research will determine if there is a correlation between teacher turnover and student

academic achievement across ethno-racial, and SES student demographics in eight of Massachusetts' urban and suburban public schools.

The second research question states, "What is the relationship between school region type in Massachusetts and student achievement on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?" and includes the sub-questions (a) "What is the relationship between school region type in Massachusetts and the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?" and (b) "What is the relationship between school region type in Massachusetts and the achievement of students who are economically disadvantaged and non-economically disadvantaged on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?" By collecting student test score data, from the Massachusetts Department of Education, this research will determine what relationship exists between school region type and student academic achievement across ethno-racial and SES student demographics in eight of the state's urban and suburban public-school districts.

The following literature review provides an outline for existing research on teacher retention and student academic achievement across the U.S. and insight into the struggles of urban education and teacher turnover, in particular. Current findings on the impact of teacher attrition on student academic success are inconclusive. The current study uses correlational analyses and T-tests to determine the significance of relationships between student success in correspondence with student race and socioeconomic status (SES) across school region type. The data concludes that students in suburban schools, regardless of race and SES, outperform students in urban schools in each of the 8 institutions observed. Teacher retention does correlate

with student test scores, but it is not more significant for students of color, nor for economically disadvantaged students, than it is for white and non-economically disadvantaged students. When analyzing the relationship between student race and test achievement across school type, it was found that white students outperform students of color regardless of school type, but school region type does impact the achievement of Black and Latinx students. In the analysis of student SES and achievement, it was found that non-economically disadvantaged students have higher percentages of student scores meeting or exceeding test standards than do economically disadvantaged students, regardless of school type. These findings lead to the discussion of implications of the wealth and racial achievement gaps in Massachusetts public schools.

CHAPTER TWO

LITERATURE REVIEW

The following section will review some of the existing literature surrounding teacher turnover in the U.S., and the impact it carries across urban and suburban school settings. The first section will discuss the state of educator turnover at a national level, looking at turnover trends, some of the common causes behind teacher turnover, and the annual costs of turnover across different states. The following section will then discuss the particular struggles created by turnover in urban public schools. This will include a discussion on turnover's impact on school staffing and budgets, while highlighting the teacher quality gap in urban schools. The third section of this literature review will consider the contrasting existing research on the consequences of teacher turnover for student academic achievement.

Causes of Teacher Turnover

Using the Maslach Burnout Inventory (MBI), researchers in a U.S. study found that, of a sample of 11,067 human service professionals, K-12 educators have a higher average level of burnout than all other reported occupations (Richardson et al., 2014). To investigate this disproportionate rate of turnover, many studies have surveyed and published interviews with primary and secondary educators regarding their job satisfaction and reasons for migrating or leaving schools. Some commonly identified factors reported by teachers include salary attainment, a lack of administrative support, a lack of professionalism and respect in the workplace, and the pressures of state and federal mandates which inform their teaching (Hughes, 2012). In fact, in 2014, the National Education Association (NEA) reported that 45% of teachers

had considered leaving the profession due to the pressures of standardized testing (Mertler, 2016).

Teachers are reporting that they feel pressured by additional duties, outside of the classroom, adding to their workload, and that administrators generally do not understand and/or do not empathize with their struggles (Wronowski, 2017). Beyond their immediate responsibilities in the classroom, teachers are additionally tasked with developing their curriculum, planning lessons, assessing students, attending staff meetings, attending IEP meetings, joining committees, etc. However, without proper planning time incorporated in their daily schedule, teachers are often bringing home materials to prepare and papers to grade in their free time just to keep up with daily demands. Having little time for self-care, a high sense of responsibility, and often insufficient pay, teachers are burning out at a very fast pace.

While many previous studies have placed heavy importance on the race of the students as a factor in teacher turnover, many educators in urban settings cite a lack of administrative support as one of their principal reasons for leaving (Albright et al., 2017). At the primary and secondary levels, it is, in fact, school leadership that is most predictive of teacher migration between schools (Ladd, 2011). Within other fields, employees may include material benefits as indicators of working conditions. However, it has been found that educators are often in search of a more encompassing definition of favorable work conditions. Teachers often look for supportive school leadership, an encouraging school culture, and positive relationships with their co-workers and other teachers more than they look for the accessibility of material resources (Johnson et al., 2012). Therefore, when these standards for their work environment are not being met, many teachers choose to move or leave.

Teacher turnover impacts not only the school personnel and the students and families they serve, but it also weighs heavily on school budgets. For instance, as of 2007, the average cost of a teacher leaving in New Mexico was $4,366, in North Carolina just under $10K per teacher, in Milwaukee it was $15, 325 per teacher, and in Chicago expenses were at a staggering $17,872 per teacher leaving (Barnes et al., 2007). As of 2012, it was costing the nation $2.2 billion annually to recruit, hire and train new educators (Hughes, 2012). These turnover costs are particularly hindering to the budgets of low-income schools and those with high populations of minority students because the expenses are flowing into the hiring of new teachers rather than professional development opportunities for existing faculty and staff (Barnes et al., 2007).

The Challenges of Urban Turnover

Educators in urban schools are combatting some challenges which teachers in smaller, suburban districts do not regularly face. Urban districts tend to be much larger than their suburban counterparts, leading them to often deal with more bureaucratic obstacles which lead teacher contracts to be produced, long after those in suburban districts, in the late summer. This leaves urban schools with a smaller pool of qualified candidates to staff their classrooms (Jacobs, 2007).

To remedy this shortage of teachers, urban schools often either hire teachers without experience, hire long-term substitute teachers who lack certification, or they increase class sizes (Jacob, 2007; Podolsky et al., 2016). However, each of these options leaves students in learning environments which are ill-prepared to foster their education in a meaningful way. Students in urban schools are statistically twice as likely than suburban students to have an inexperienced or uncertified teacher, and the educators who are the most effective are deemed highly likely to leave within their first five years in an urban school (Wronowski, 2017).

Although the national teacher turnover rate was 17% in 2017, the turnover rate for urban districts was even higher at 20% (Albright et al., 2017). Schools which receive Title 1 funding, which are often in urban districts, have an average turnover rate that is 50% higher than non-Title 1 funded schools (Carver-Thomas & Darling-Hammond, 2019). This type of funding, put forth by the Every Student Succeeds Act (ESSA), is designated to schools and agencies which serve students from low-income households ("The NCES Fast Facts," 2019). The turnover of experienced teachers is 80% higher in Title 1 schools (Carver-Thomas & Darling Hammond, 2019). Students in the most underfunded schools are rapidly losing some of their most qualified teachers. Schools often act as a consistent, stable environment for students, many of whom in urban districts struggle with socioeconomic challenges at home. So, when there is high teacher turnover, not only are districts faced with the challenge of staffing, but students are confronted with a higher sense of instability.

In a study conducted by Goldhaber et al. (2015), researchers found that there is a distinct teacher quality gap occurring across schools with varying student demographics. When comparing every measure of teacher quality (licensure exam scores, years of experience, etc.), researchers remarked that quality teachers are being unevenly distributed across every indication of student disadvantage (race, eligibility for free and reduced lunch, low achieving) (Goldhaber et al., 2015). With inexperienced and minimally effective teachers being disproportionately funneled into urban schools, students of color and of low-SES are being subjected to a lower-quality of education and may be impacted more heavily by the repercussions of rampant teacher turnover.

Impacts of Turnover on Student Achievement

Much of the existing research on the effects of teacher turnover has shown that teacher attrition has a negative impact on student achievement. Correlations show that schools with higher rates of turnover have lower levels of student achievement (Guin, 2004). When a teacher makes the decision to leave, especially a low-income school, they are often replaced with an educator who is much less experienced, such as a first- year teacher, making it difficult to build "instructional capacity" and a strong organizational culture at the school (Johnson et al., 2012). For, now this new teacher must not only build their skills in the classroom, but they must take time to learn about the school procedures and organization, during which they will, of no fault of their own, be less effective than the seasoned teacher who has chosen to exit.

This type of transition has proven to not only affect the students of the migrating teacher, but also the students of the teachers who have remained, often referred to as the "stayers" (Ronfeldt et al., 2013). As teachers leave, staff and students lose pieces of their school culture and their sense of consistency and support. Even after controlling for teacher quality, research has found that teacher turnover has a significantly negative impact on the English language arts (ELA) and math achievement of students particularly in schools with high populations of black students as well as low-performing students (Ronfeldt et al., 2013).

Although there are many documentations of student achievement suffering due to teacher attrition, some researchers still maintain a school of thought in which teacher turnover may be viewed as a positive cycling of teachers for the sake of quality instruction (Guin, 2004; Ronfeldt et al., 2013). In 2009, the District of Columbia (D.C.) Public School District implemented the IMPACT program in the interest of evaluating the effectiveness of district teachers and eliminating those who were considered "minimally effective" or "ineffective" (Adnot et al.,

2017). Researchers studied the effects of this program on student achievement between 2011-2013, and found that when low-performing teachers left, student achievement rose by 21% of a standard deviation (SD) in math, and by 14% of a SD in reading (Adnot et al., 2017). Although the migration of highly effective teachers was found to have a negative impact on achievement, researchers deemed this statistically insignificant to the study (Adnot et al., 2017). Hanushek has also suggested that replacing 5-10% of the lowest-performing teachers annually may lead to a rise in student achievement by 50% of a SD (Hanushek, 2009). While many see first year teachers as the least-effective educators, Staiger and Rockoff state that replacing 80% of first-year teachers would increase student outcomes by 8% of a SD (Staiger & Rockoff, 2010).

An urban district in Texas provides a contrasting reality. Hanushek et al. (2016) found that, while there was little evidence to prove that turnover had an adverse effect on higher-achieving schools, turnover did in fact have adverse effects in schools that were already lower-achieving. Researchers claim that the loss of teacher experience when a teacher leaves, offsets the potential gains of shedding less-effective teachers (Hanushek et. al., 2016). This discrepancy, once more, observed between the quality of teachers and student achievement rates in low-achieving/high-minority schools and their higher-achieving school counterparts is troubling.

Conclusions

Existing literature provides a foundational understanding of teacher turnover. It discusses the importance of school organization and leadership in relationship to teachers' sense of job satisfaction and burnout. When teachers feel overworked and under-appreciated, many make the decision to either move schools or to leave the profession altogether, resulting in a large financial toll on schools' annual budgets, and the replacement of teachers with less experienced and at times under-qualified teachers, especially in urban school districts. This consequence of turnover

leads many researchers to believe that higher rates of educator attrition may correlate with higher rates of low student academic achievement. However, there is insufficient data to date to support this claim. Despite the several studies finding a negative impact on student achievement, some researchers maintain that the annual cycling out of teachers may prove to be beneficial for student achievement. With conflicting conclusions on the impacts of turnover on test scores, the current study will work to uncover this relationship with regard to eight public school districts in Massachusetts. In pursuit of furthering existing research, the following research questions focus on the correlation between teacher turnover and student achievement on state standardized tests in Massachusetts public school districts across student ethno-racial and SES demographics in the state's urban and suburban public schools.

CHAPTER THREE

RESEARCH QUESTIONS AND METHODOLOGY

Research Questions

(1) How is teacher retention in urban and suburban public-school districts in Massachusetts associated with student achievement on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?

(a) How is teacher retention in urban and suburban public-school districts in Massachusetts associated with the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?

(b) How is teacher retention in urban and suburban public-school districts in Massachusetts associated with the achievement of students who are economically disadvantaged and non-economically disadvantaged on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?

(2) What is the relationship between school region type in Massachusetts and student achievement on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?

(a) What is the relationship between school region type in Massachusetts and the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?

(b) What is the relationship between school region type in Massachusetts and the achievement of students who are economically disadvantaged and non-economically disadvantaged on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?

Methodology

This study is a quantitative analysis of school level data. Data was collected from a total of eight urban and suburban public-school districts in Massachusetts to determine the number of teachers retained in each district during the 2016-2018 school years using the Massachusetts Department of Education archives found online. Additionally, student achievement data from the Next-Generation Massachusetts Comprehensive Assessment System (MCAS) was collected from said districts for the years 2017-2019. Though I had originally intended on including earlier MCAS data, consistent data was unavailable due to the state changing the version of MCAS distributed to students in 2017.

It should be noted that the discrepancy in year ranges for turnover and achievement is due to the fact that teacher turnover from the previous year would impact the following year's student achievement. Such data was represented across three year-cycles (2016-2017, 2017-2018, and 2018-2019). Testing data collected was compared by student SES as well as student ethno-racial group. Specifically, data was collected on the achievement of White, Black, and Latinx students in comparison to the entirety of the student body's achievement in each district. These three ethno-racial groups were selected to report on because they have the most significant amount of data available on the Massachusetts Department of Education website.

The collected data was placed in spreadsheets using the program Excel. The program Statistical Package for the Social Sciences (SPSS) was used to conduct correlational analysis to

determine if there was a relationship between these sets of data. Once correlations were generated, I analyzed the differences between the relationship of teacher retention and student achievement across ethno-racial and SES student demographics. To answer the second research question, regarding the relationship between school region type and the achievement of students across demographics, independent sample T-tests were then conducted. I used SPSS once again to perform the tests using the collected data on student test achievement from the 8 school districts observed, across student demographics and school region type during the three year-cycles previously mentioned.

CHAPTER FOUR

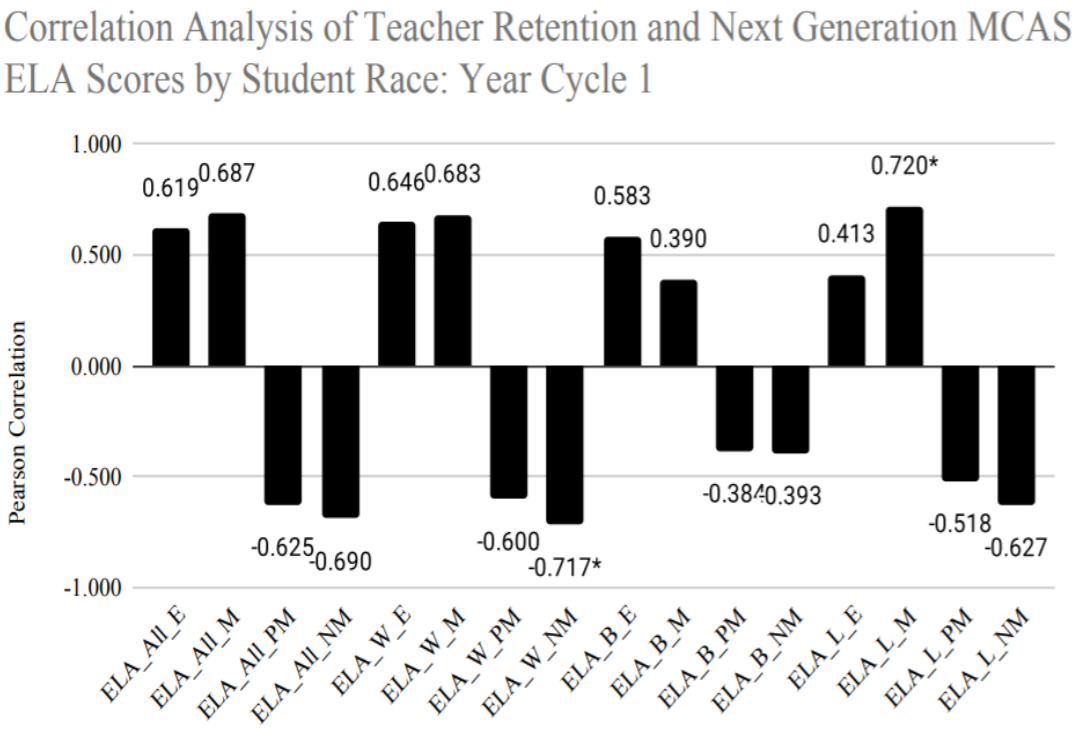
RESULTS

The hypothesis for this study was that there would be a negative correlation between teacher retention and student test scores not meeting and partially meeting standards on the Next Generation MCAS. Correspondingly, it was hypothesized that there would be a positive correlation between teacher retention and student test scores meeting and exceeding standards on the Next Generation MCAS. It was further hypothesized that such correlations would be significant for Black and Latinx students as well as for economically disadvantaged (ED) students. The results of this study support the hypothesis that teacher retention is associated with student test scores. However, the data do not support the hypothesis that this correlation is associated with the variables of student race or socioeconomic status.

Teacher Retention and Student Test Scores by Race

In this paragraph, I will provide the data results for the correlations between teacher retention and student test scores on Next Generation MCAS in the area of English Language Arts (ELA) across racial groups during each of the three-year cycles studied. During year cycle 1, teacher retention was significantly negatively correlated with white student test scores not meeting ELA standards on the Next Generation MCAS ($r=-0.72$, $p=0.046$). Teacher retention was also significantly positively correlated with Latinx student test scores meeting ELA standards on the Next Generation MCAS ($r=0.72$, $p=0.044$). Variables of student demographic including “all students” test scores, and Black student test scores showed no statistically significant correlation (see Figure 1). Year cycle 2 did not show any correlational significance

between the variables (see Figure 2). During year cycle 3, teacher retention was significantly positively correlated with all students' test scores meeting ELA standards, (r=0.79, p=0.020), and significantly negatively correlated with all students' test scores not meeting ELA standards, (r=-0.79, p=0.019). Data also shows a significantly positive correlation between teacher retention and white student test scores meeting ELA standards, (r=0.75, p=0.034), and a significantly negative correlation between retention and Latinx student test scores not meeting ELA standards, (r=-0.72, p=0.043). Black student achievement showed no statistically significant correlation with teacher retention during this year's cycle (see Figure 3).



*Correlation is significant at the 0.01 level (2-tailed)

Figure 1. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of "all students," as well as students who are white, Black, and Latinx, on Next Generation MCAS during the 2016-2017 year's cycle.

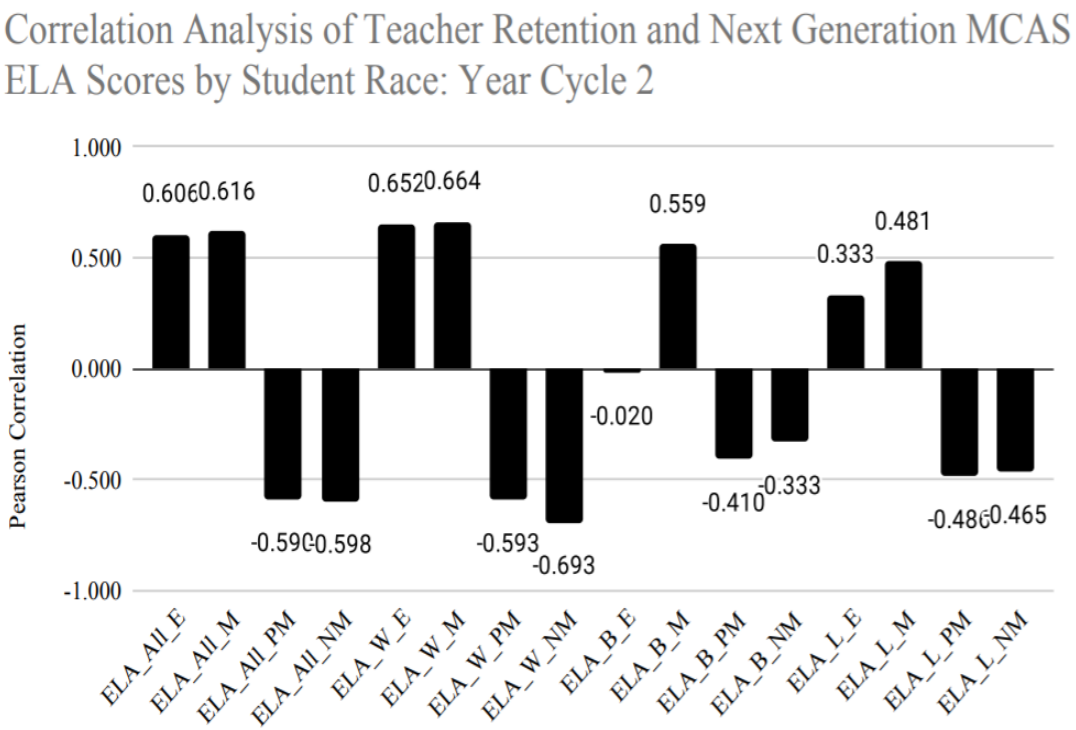
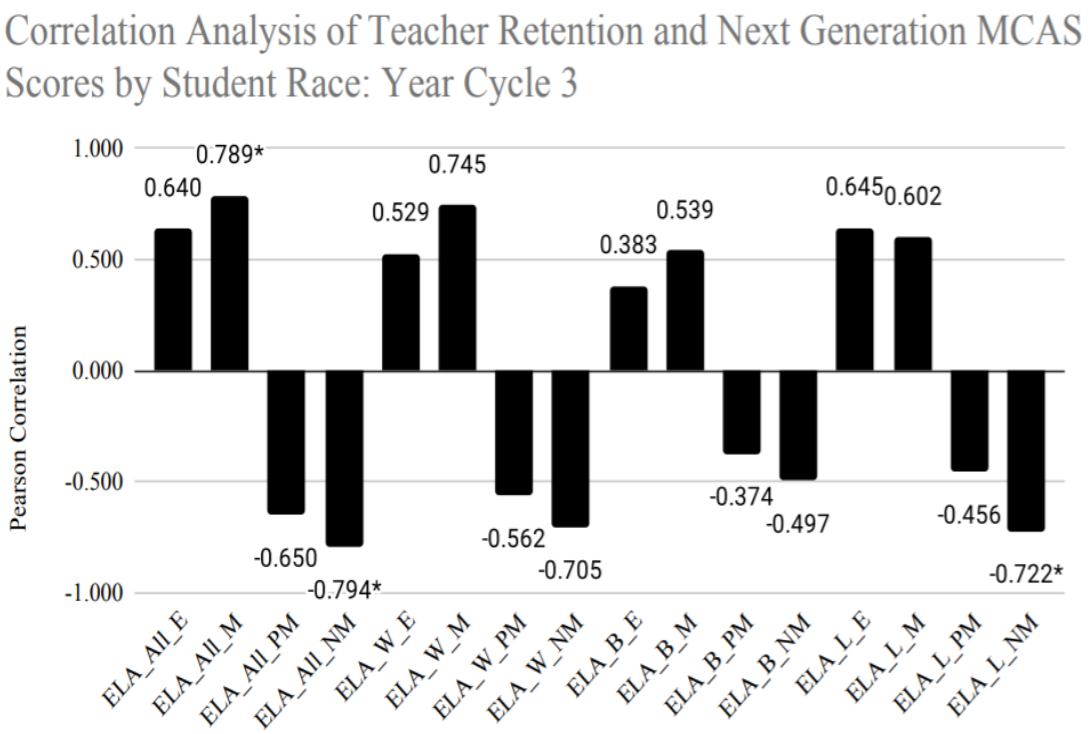


Figure 2. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of "all students," as well as students who are white, Black, and Latinx, on Next Generation MCAS during the 2017-2018 year's cycle.



*Correlation is significant at the 0.01 level (2-tailed)

Figure 3. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of "all students," as well as students who are white, Black, and Latinx, on Next Generation MCAS during the 2018-2019 year's cycle.

In the following paragraph, I will provide the results for the correlations between teacher retention and student achievement on Next Generation MCAS in the area of mathematics across socioeconomic demographics. Data regarding student achievement in the area of mathematics showed no significant correlation with teacher retention during year cycle 1 (see Figure 4). During year cycle 2, the data show a significantly positive correlation between teacher retention and white student scores meeting math standards, r=0.75, p=0.032, as well as a significantly negative correlation between retention and white student scores not meeting math standards on the assessment, r=-0.80, p=0.016. There is no significant correlation between the academic achievement of "all students," Black students, or Latinx students and teacher retention (see

Figure 5). In year cycle 3, the data shows a significantly positive correlation between teacher retention and all student test scores meeting math standards, r=0.76, p=0.029, and a significantly negative correlation between retention and all students' test scores not meeting math standards, r=-0.80, p=0.017. White student test scores not meeting math standards were significantly negatively correlated with teacher retention, r=-0.73, p=0.038, and Latinx student test scores meeting math standards were significantly positively correlated with teacher retention, r=0.74, p=0.036. Black student achievement showed no statistically significant correlation with teacher retention during this year's cycle (see Figure 6).

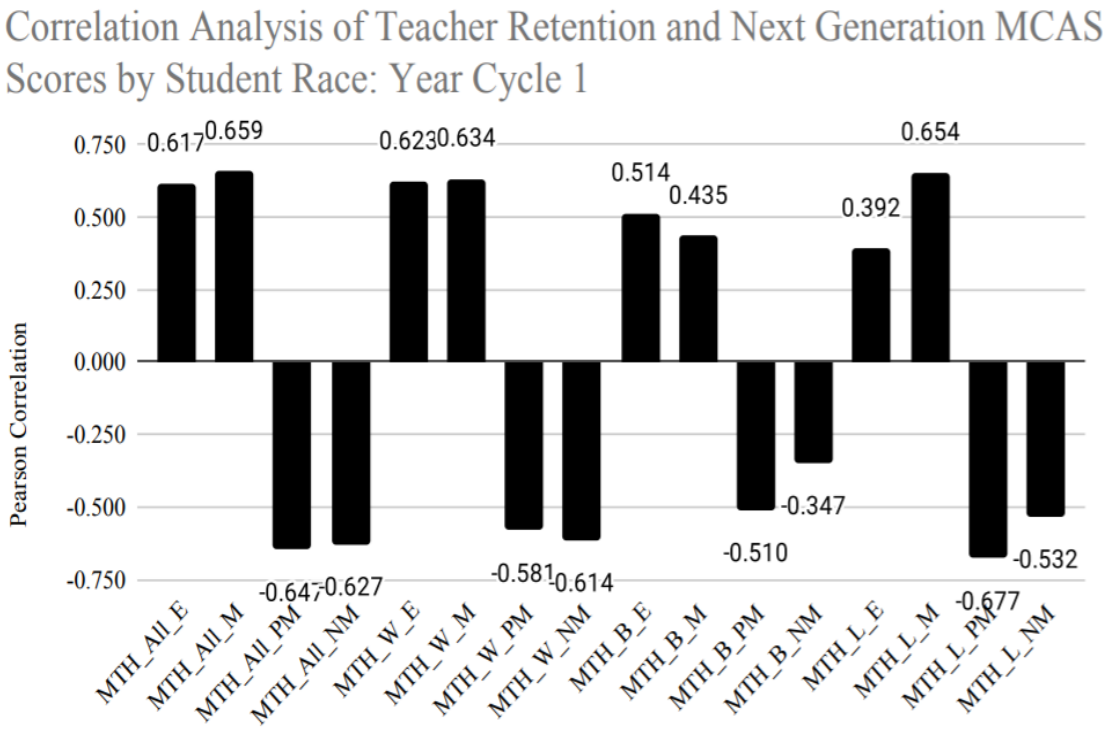
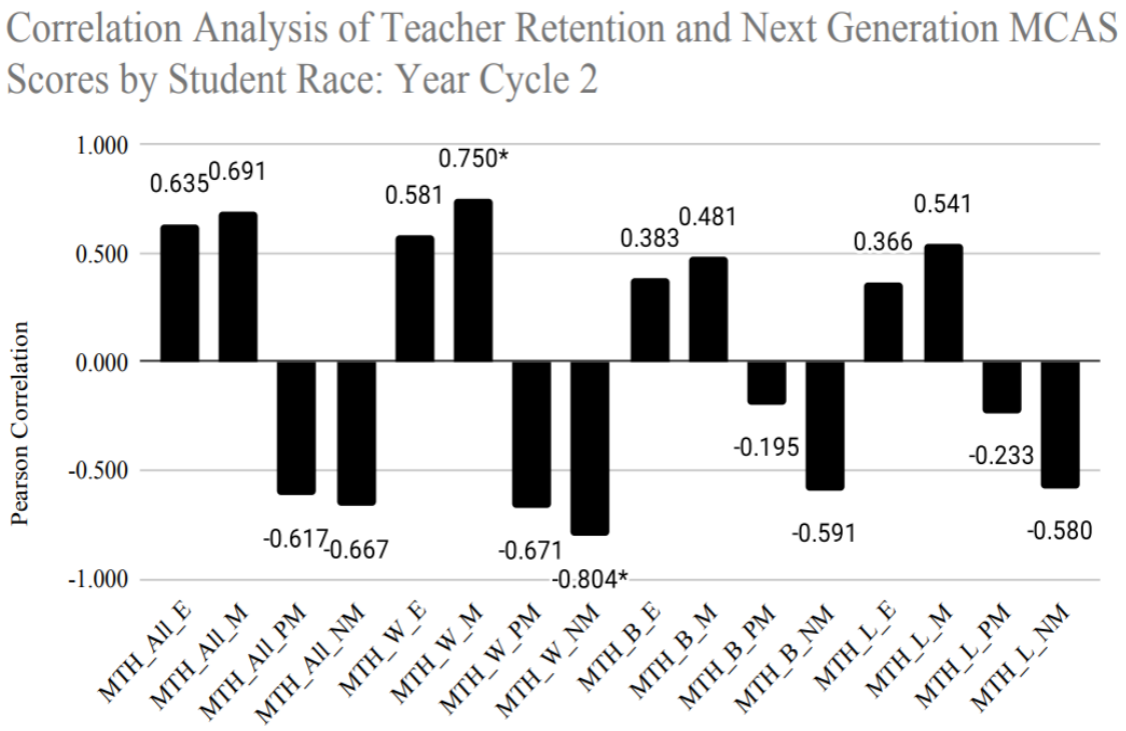
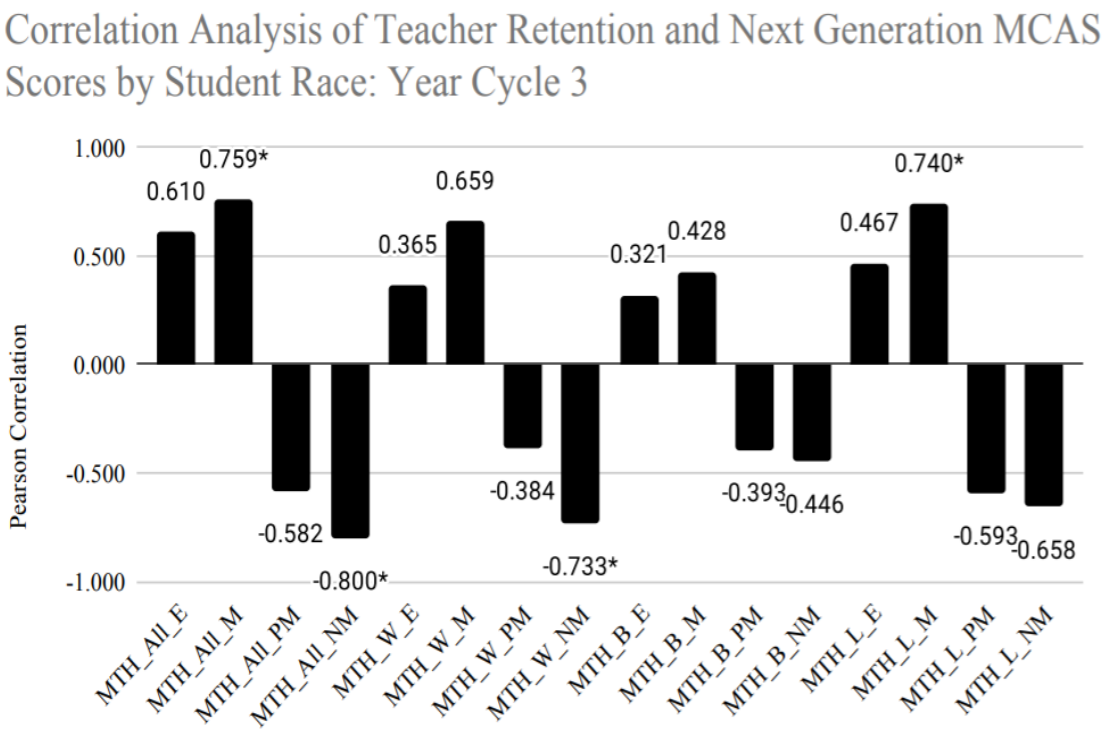


Figure 4. Correlation coefficient of teacher retention and the math achievement scores, of "all students," as well as students who are White, Black, and Latinx, on Next Generation MCAS during the 2016-2017 year's cycle.



*Correlation is significant at the 0.01 level (2-tailed)

Figure 5. Correlation coefficient of teacher retention and the math achievement scores, of "all students," as well as students who are White, Black, and Latinx, on Next Generation MCAS during the 2017-2018 year's cycle.



*Correlation is significant at the 0.01 level (2-tailed)

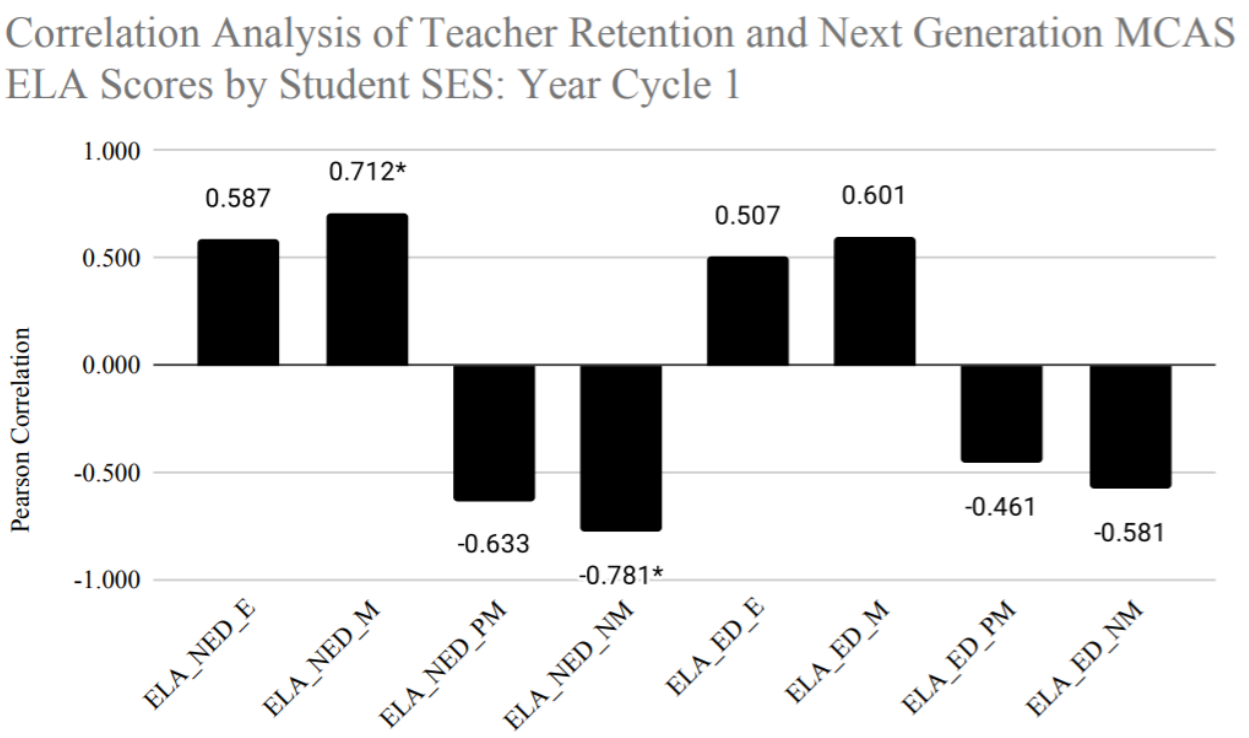
Figure 6. Correlation coefficient of teacher retention and the math achievement scores, of "all students" as well as students who are White, Black, and Latinx, on Next Generation MCAS during the 2018-2019 year's cycle.

The data support the hypothesis that teacher retention is positively correlated with the ELA and math test scores of "all students," White students, and Latinx students who are meeting standards on the Next Generation MCAS. This means that as more teachers are retained, more student scores in the student groups mentioned are meeting test standards in both subject areas studied. Teacher retention is also negatively correlated with the test scores of these student groups not meeting standards on the Next Generation MCAS. This means that as more teachers are retained, less student scores are not meeting test standards. Black student test scores did not show any significant correlation with teacher retention throughout the three-year cycles observed.

Teacher Retention and Student Test Scores by SES

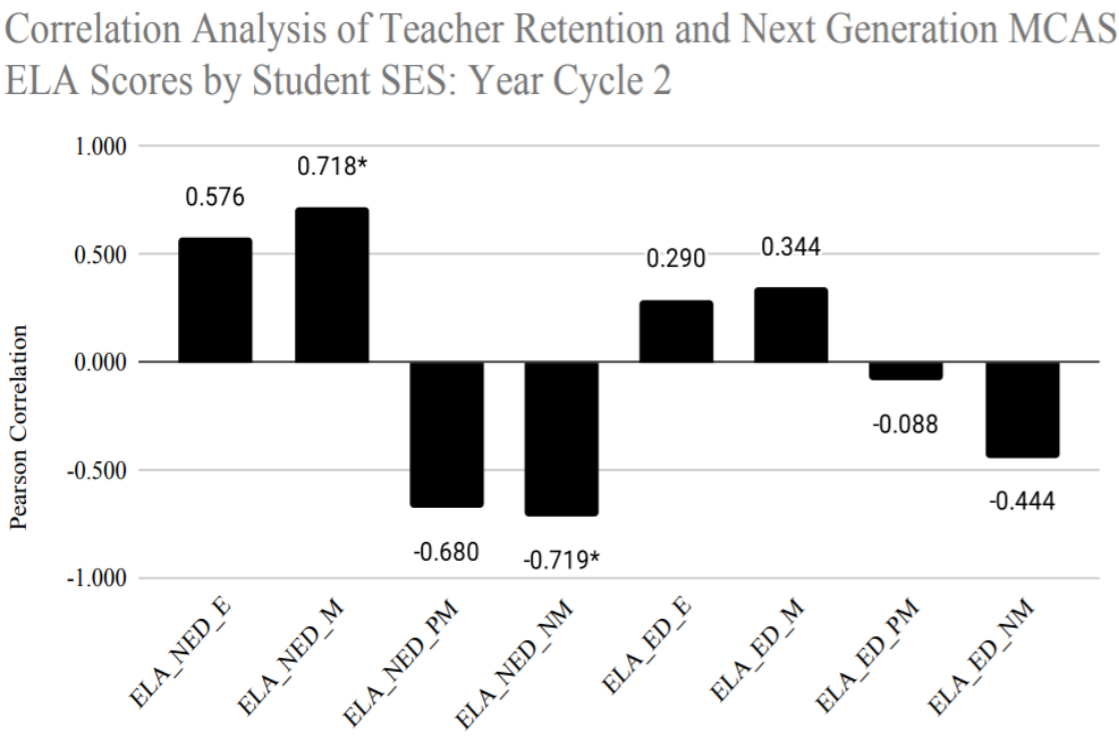
Another hypothesis for this study was that the previously mentioned correlation between teacher retention and student achievement on the Next Generation MCAS would have more significance for students who are economically disadvantaged (ED) than for those who are not economically disadvantaged (NED). The data do not support this hypothesis.

In this paragraph, I will provide the data results for the correlations between teacher retention and student test scores on Next Generation MCAS in the area of ELA across socioeconomic status (SES) during each of the three-year cycles studied. During year cycle 1, there was a significantly positive correlation between teacher retention and NED student test scores meeting ELA standards, $r=0.71$, $p=0.048$, and a significantly negative correlation between retention and NED student test scores not meeting ELA standards, $r=-0.78$, $p=0.022$ (see Figure 7). Year cycle 2 shows a significantly positive correlation between teacher retention and NED student test scores meeting ELA standards, $r=0.72$, $p=0.045$, and a significantly negative correlation between NED student test scores who are not meeting ELA standards, $r=-0.72$, $p=0.044$ (see Figure 8). During year cycle 3, there was a significantly positive correlation between teacher retention and NED student test scores meeting ELA standards, $r=0.73$, $p=0.041$, and a significantly negative correlation between retention and NED student test scores not meeting ELA standards, $r=-0.85$, $p=0.008$ (See Figure 9). There was no significant correlation between retention and ED student test scores in the area of ELA achievement throughout the three-year cycles studied.



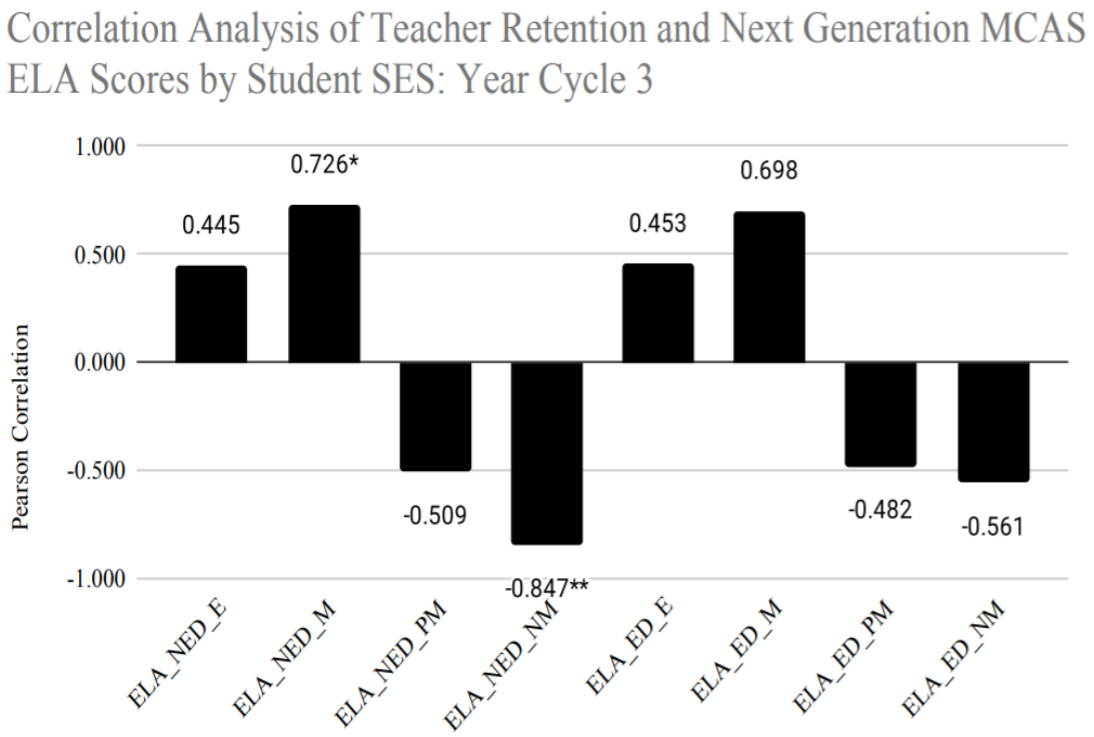
*Correlation is significant at the 0.01 level (2-tailed)

Figure 7. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of students who are not-economically disadvantaged and students who are economically disadvantaged, on Next Generation MCAS during the 2016-2017 year's cycle.



*Correlation is significant at the 0.01 level (2-tailed)

Figure 8. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of students who are not-economically disadvantaged and students who are economically disadvantaged, on Next Generation MCAS during the 2017-2018 year's cycle.



*Correlation is significant at the 0.01 level (2-tailed)

**Correlation is significant at the 0.05 level (2-tailed)

Figure 9. Correlation coefficient of teacher retention and the English Language Arts achievement scores, of students who are not-economically disadvantaged and students who are economically disadvantaged, on Next Generation MCAS during the 2018-2019 year's cycle.

In this paragraph, I will provide the data results for the correlations between teacher retention and student test scores on Next Generation MCAS in the area of mathematics across SES during each of the three-year cycles studied. During year cycle 1, there is a significant negative correlation between teacher retention and NED student test scores not meeting standards on the assessment, r=-0.73, p=0.041. There is also a significantly negative correlation between teacher retention and ED student test scores partially meeting math standards, r=-0.76, p=0.03 (see Figure 10). During year cycle 2, the data shows a significantly positive correlation between retention and NED student test scores meeting math standards, r=0.76, p=0.029. NED

student test scores not meeting standards also correlate significantly negatively with teacher retention, r=-0.82, p=0.012. There is no significant correlation between retention and ED students' math achievement during this year cycle (see Figure 11). Year cycle 3 shows one significant correlation of the relationships tested. There is a significant negative correlation between teacher retention and NED student test scores not meeting math standards, r=-0.76, p=0.028. There is no significant correlation between teacher retention and the math achievement of ED students during this year-cycle (see Figure 12).

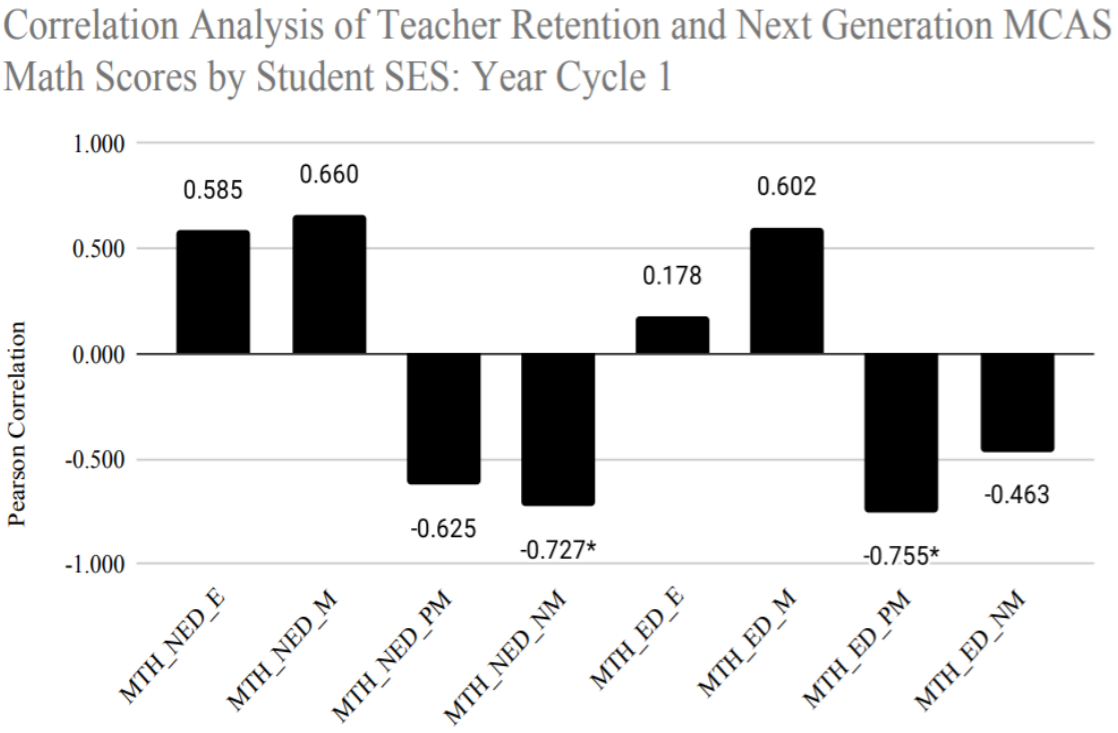


Figure 10. Correlation coefficient of teacher retention and the math achievement scores, of students who are not-economically disadvantaged and of students who are economically disadvantaged, on Next Generation MCAS during the 2016-2017 year's cycle.

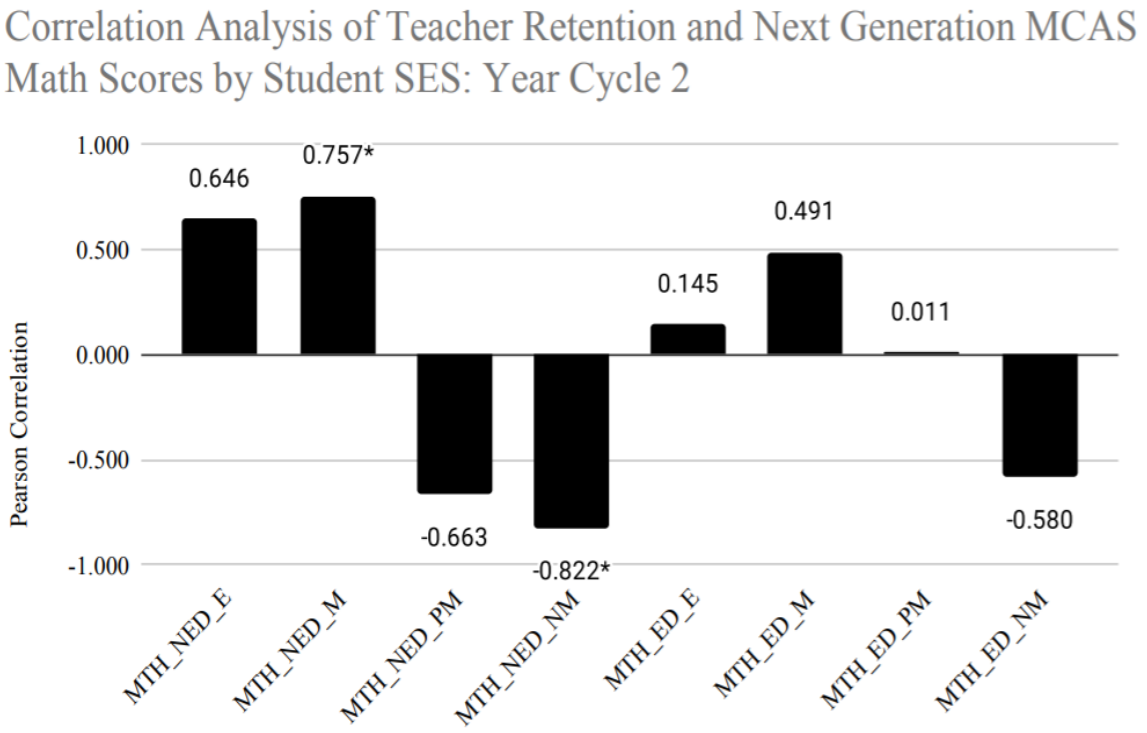


Figure 11. Correlation coefficient of teacher retention and the math achievement scores, of students who are not-economically disadvantaged and of students who are economically disadvantaged, on Next Generation MCAS during the 2017-2018 year's cycle.

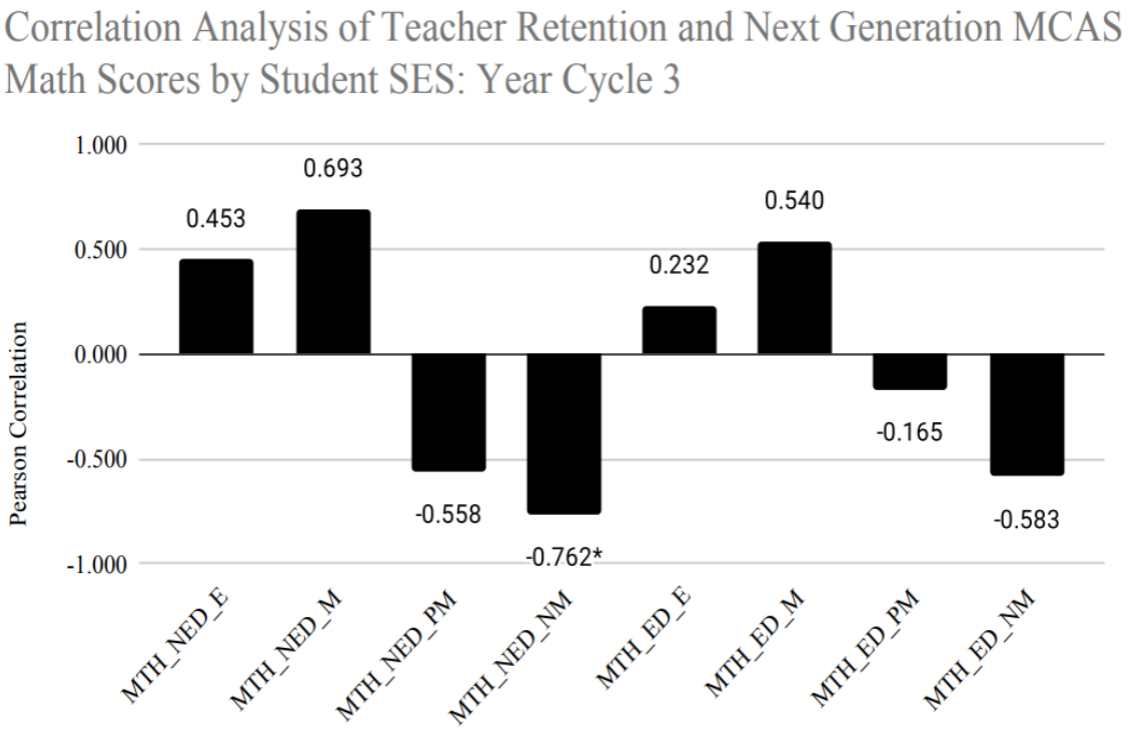


Figure 12. Correlation coefficient of teacher retention and the math achievement scores, of students who are not-economically disadvantaged and of students who are economically disadvantaged, on Next Generation MCAS during the 2018-2019 year's cycle.

The data supports the hypothesis that teacher retention is positively correlated with the ELA and math test scores of NED students which are meeting standards, and negatively correlated with the ELA and math test scores of NED students which are not meeting standards on the Next Generation MCAS. Test scores of ED students showed one significant correlation with teacher retention throughout the three-year cycles observed. ED student math scores which were partially meeting standards during year cycle 1 were significantly negatively correlated with teacher retention.

Racial Achievement on Next Generation MCAS by School Type

Another hypothesis of this study states that there is a significant difference between student test scores, across racial demographics in ELA and math on the Next Generation MCAS, in urban and suburban schools. The following paragraph will provide results to independent sample T-tests, comparing student ELA achievement averages for "all students" across urban and suburban schools during the three-year cycles observed.

Suburban schools had a higher average percentage of "all students" scores exceeding ELA standards (M=8.42, SD=3.97) than did urban schools (M=4.00, SD=0.85), t(22)=3.77, p=0.001. Suburban schools also had a higher percentage of "all students" scores meeting ELA standards (M=48.08, SD=7.53) than did urban schools (M=32.83, SD=3.93), t(16.6)=6.22, p=0.00. Urban schools had a higher percentage of "all students" scores partially meeting ELA standards (M=46.42, SD=2.61) than did suburban schools (M=36.67, SD=8.24), t(13.2)=-3.91, p=0.002. Urban schools also had a higher percentage of "all students" scores not meeting ELA standards (M=16.58, SD=3.66) than did suburban schools (M=7.08, SD=2.68), t(22)=-7.26, p=0.00 (see Table 1).

Table1. T-Test Results for T-Test Results for Student Scores on Next Generation MCAS in the Subject Area of English Language Arts for "All Students," and Students who are White, Black, and Latinx

Test Results	School type	N	Mean	Std. Deviation	t	Sig. (2-tailed)
ELA_All_E	1	12	8.42	3.965		
	2	12	4.00	0.853	3.773	0.003
ELA_All_M	1	12	48.08	7.525		
	2	12	32.83	3.927	6.223	0
ELA_All_PM	1	12	36.67	8.239		
	2	12	46.42	2.610	-3.908	0.002
ELA_All_NM	1	12	7.08	2.678		
	2	12	16.58	3.655	-7.263	0
ELA_W_E	1	12	8.50	3.754		
	2	12	5.58	1.782	2.432	0.027
ELA_W_M	1	12	49.83	5.670		
	2	12	39.25	4.731	4.964	0
ELA_W_PM	1	12	35.58	7.179		
	2	12	42.75	3.911	-3.037	0.006
ELA_W_NM	1	12	6.42	2.109		
	2	12	12.25	3.166	-5.312	0
ELA_B_E	1	12	4.17	3.157		
	2	12	2.33	0.888	1.936	0.075
ELA_B_M	1	12	38.83	11.877		
	2	12	27.42	4.542	3.11	0.008
ELA_B_PM	1	12	46.67	11.680		
	2	12	50.25	3.911	-1.008	0.331
ELA_B_NM	1	12	10.33	4.735		
	2	12	20.17	3.996	-5.497	0
ELA_L_E	1	12	5.83	2.758		
	2	12	1.92	0.669	4.781	0
ELA_L_M	1	12	37.75	10.897		
	2	12	24.50	2.393	4.114	0.001
ELA_L_PM	1	12	44.83	8.043		
	2	12	51.17	2.082	-2.641	0.021
ELA_L_NM	1	12	11.67	6.213		
	2	12	22.58	2.906	-5.513	0

1= Suburban
2= Urban
W= White
B= Black
L= Latinx
E= Exceeding
M= Meeting
PM= Partially Meeting
NM= Not Meeting

This paragraph will provide results to independent sample T-tests, comparing student ELA achievement averages for white students across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher percentage of white student scores exceeding ELA standards (M=8.50, SD=3.75) than did urban schools (M=5.58, SD=1.78), t(15.7)=2.43, p=0.027. Suburban schools also had a higher percentage of white student scores meeting ELA standards (M=49.83, SD=5.67) than did urban schools (M=39.25, SD=4.73), t(22)=4.96, p=0.00. Urban schools had a higher percentage of white student scores partially meeting ELA standards (M=42.75, SD=3.91) than did suburban schools (M=35.58, SD=7.18), t(22)=-3.037, p=0.006. Urban schools also had a higher percentage of white student scores not meeting ELA standards (M=12.25, SD=3.17) than did suburban schools (M=6.42, SD=2.11), t(22)=-5.31, p=0.00 (see Table 1).

This section will provide results to independent sample T-tests, comparing student ELA achievement averages for Black students across urban and suburban schools during the three-year cycles observed. The relationship between Black student test scores exceeding ELA standards in suburban schools (M=4.17, SD=3.16) and urban schools (M=2.33, SD=0.89) did not show a significant association, t(12.7)=1.94, p=0.075. Suburban schools had a higher percentage of Black student scores meeting ELA standards (M=38.83, SD=11.88) than did urban schools (M=27.42, SD=4.54), t(14.2)=3.11, p=0.008. The relationship between Black student test scores partially meeting ELA standards in urban schools (M=50.25, SD=3.91) and suburban schools (M=46.67, SD=11.68) does not show a significant association, t(13.4)=-1.008, p=0.331. Urban schools had a higher percentage of Black student scores not meeting ELA standards (M=20.17, SD=4.00) than did suburban schools (M=10.33, SD=4.74), t(22)=-5.50, p=0.00 (see Table 1).

Lastly, this paragraph will provide results to independent sample T-tests, comparing student ELA achievement averages for Latinx students across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher percentage of Latinx student scores exceeding ELA standards (M=5.83, SD=2.76) than did urban schools (M=1.92, SD=0.67), t(12.3)=4.78, p=0.00. Suburban schools also had a higher percentage of Latinx student scores meeting ELA standards (M=37.75, SD=10.90) than did urban schools (M=24.50, SD=2.39), t(12.1)=4.11, p=0.001. Urban schools had a higher percentage of Latinx student scores partially meeting ELA standards (M=51.17, SD=2.08) than did suburban schools (M=44.83, SD=8.04), t(12.5)=-2.64, p=0.021. Urban schools also had a higher percentage of Latinx student scores not meeting ELA standards (M=22.58, SD=2.91) than did suburban schools (M=11.67, SD=6.21), t(15.6)=-5.51, p=0.00 (see Table 1).

In this paragraph, I will provide the results to independent sample T-tests, comparing student math achievement averages for "all students" across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher percent of "all students" scores exceeding standards on the math Next Generation MCAS, (M=7.33, SD=4.14) than did urban schools, (M=4.00, SD= .35), t(13)=2.65, p=0.020. Suburban schools also had a higher percent of "all students" scores meeting math standards, (M=44.58, SD=11.77) than did urban schools, (M=31.17, SD=5.81), t(16)=3.54, p=0.003. Conversely, urban schools had a higher percent of "all students" scores partially meeting math standards, (M=46.67, SD=3.26) than did suburban schools (M=39.17, SD=9.94), t(13)=-2.48, p=0.027). Urban schools also had a higher percentage of "all students" scores not meeting math standards (M=18.17, SD=4.45) than did suburban schools (M=8.92, SD=5.85), t(22)=-4.36, p=0.00 (see Table 2).

Table 2. T-Test Results for Student Scores on Next Generation MCAS in the Subject Area of Mathematics for "All Students," and Students who are White, Black, and Latinx

Test Results	School type	N	Mean	Std. Deviation	t	Sig. (2-tailed)
MTH_All E	1	12	7.33	4.141	2.651	0.02
	2	12	4.00	1.348		
MTH_All M	1	12	44.58	11.766	3.541	0.003
	2	12	31.17	5.813		
MTH_All PM	1	12	39.17	9.944	-2.483	0.027
	2	12	46.67	3.257		
MTH_All NM	1	12	8.92	5.854	-4.358	0
	2	12	18.17	4.448		
MTH_W E	1	12	7.00	3.643	1.087	0.289
	2	12	5.67	2.188		
MTH_W M	1	12	46.58	9.821	2.651	0.015
	2	12	37.67	6.272		
MTH_W PM	1	12	38.83	9.183	-1.337	0.195
	2	12	42.92	5.248		
MTH_W NM	1	12	7.83	4.152	-3.518	0.002
	2	12	13.58	3.848		
MTH_B E	1	12	3.92	3.059	2.582	0.024
	2	12	1.58	0.669		
MTH_B M	1	12	31.83	15.414	1.381	0.187
	2	12	25.08	6.999		
MTH_B PM	1	12	49.08	10.431	-0.508	0.62
	2	12	50.67	2.807		
MTH_B NM	1	12	15.00	8.496	-2.567	0.018
	2	12	22.50	5.502		
MTH_L E	1	12	4.83	2.949	3.876	0.002
	2	12	1.42	0.793		
MTH_L M	1	12	34.92	13.297	3.064	0.009
	2	12	22.50	4.503		
MTH_L PM	1	12	46.08	8.140	-2.24	0.044
	2	12	51.50	1.977		
MTH_L NM	1	12	14.00	9.667	-3.352	0.004
	2	12	24.42	4.738		

1= Suburban
2= Urban
W= White
B= Black
L= Latinx
E= Exceeding
M= Meeting
PM= Partially Meeting
NM= Not Meeting

This paragraph will provide the results to independent sample T-tests, comparing student math achievement averages for white students across urban and suburban schools during the three-year cycles observed. The relationship between white student test scores exceeding math standards in urban schools (M=5.67, SD=2.19) and suburban schools, (M= 7.00, SD=3.64) did not show a significant association, t(22)=1.09, p=0.29, and therefore accepts the null hypothesis. Suburban schools had a higher average percentage of white student test scores meeting math standards (M=46.58, SD=9.82) than did urban schools (M=37.67, SD=6.27), t(22)=2.65, p=0.015. The relationship between white student test scores partially meeting math standards in urban schools (M=42.92, SD=5.25) and suburban schools (M=38.83, SD=9.18) did not show a significant association, t(22)=-1.34, p=0.20 and therefore accepts the null hypothesis. Urban schools had a higher average percentage of white student test scores not meeting math standards, (M=13.58, SD=3.85) than did suburban schools, (M=7.83, SD=4.15), t(22)=-3.52, p=0.002 (see Table 2).

The following paragraph will provide the results to independent sample T-tests, comparing student math achievement averages for Black students across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher average percentage of Black student scores exceeding math standards, (M=3.92, SD=3.06) than did urban schools (M=1.58, SD=0.67), t(12)=2.58, p=0.024. The relationship between Black student test scores meeting math standards in urban schools (M=25.08, SD=6.99) and suburban schools (M=31.83, SD=15.41) did not show a significant association, t(15)=1.38, p=0.187, and therefore accepts the null hypothesis. The relationship between Black student test scores partially meeting math standards in urban schools (M=50.67, SD=2.81) and suburban schools (M=49.08, SD=10.43) also did not show a significant association, t(12.6)=-0.51, p=0.620, accepting the null hypothesis.

Urban schools had a higher average percentage of Black student scores not meeting math standards (M=22.50, SD=5.50) than did suburban schools (M=15.00, SD=8.50), t(22)=-2.57, p=0.018 (see Table 2).

This paragraph will show the results of independent sample T-tests, comparing student math achievement averages for Latinx students across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher average percentage of Latinx student scores exceeding math standards (M=4.83, SD=2.95) than did urban schools (M=1.42, SD=0.79), t(12.6)=3.88, p=0.002. Suburban schools also had a higher average percentage of Latinx student scores meeting math standards (M=34.92, SD=13.30) than did urban schools (M=22.50, SD=4.50), t(13.5)=3.06, p=0.009. Urban schools had a higher average percentage of Latinx student scores partially meeting math standards (M=51.50, SD=1.98) than did suburban schools (M=46.08, SD=8.14), t(12.3)=-2.24, p=0.044. Urban schools also had a higher average percentage of Latinx student scores not meeting math standards (M=24.42, SD=4.74) than did suburban schools (M=14.00, SD=9.67), t(16)=-3.35, p=0.004 (see Table 2).

The data supports the hypothesis that there is a significant difference between student test scores, across racial demographics in ELA and math on the Next Generation MCAS, in urban and suburban schools. Across both content areas, throughout the three-year cycle observed, the data shows suburban schools having consistently higher average percentages of student test scores exceeding and meeting test standards. The data also shows urban schools having consistently higher average percentages of student test scores partially meeting and not meeting test standards. Six variables of the 32 observed showed no significant association between urban and suburban schools: including Black student scores exceeding ELA standards, Black student scores partially meeting ELA standards, White student scores exceeding math standards, White

student scores partially meeting math standards, Black student scores meeting math standards, and Black student scores partially meeting math standards.

SES Achievement on Next Generation MCAS by School Type

Another hypothesis of this study is that there will be a higher average percent of economically disadvantaged (ED) student scores that are partially meeting and not meeting test standards on Next Generation MCAS, in both ELA and math, than their non-economically disadvantaged (NED) peers across both urban and suburban schools. It is also hypothesized that suburban schools will show more student scores on average that are exceeding or meeting test standards than urban schools. The following paragraph will provide results to independent sample T-tests, comparing student ELA achievement averages for NED students across urban and suburban schools during the three-year cycles observed.

Suburban schools had a higher average percentage of NED student scores exceeding ELA standards on the Next Generation MCAS ($M=9.50$, $SD=4.10$) than did urban schools ($M=6.58$, $SD=1.78$), $t(15)=2.26$, $p=0.039$. Suburban schools also had a higher average percentage of NED student scores meeting ELA standards on the assessment ($M=52.00$, $SD=5.86$) than did urban schools ($M=42.67$, $SD=3.82$), $t(22)=4.62$, $p=0.00$. Urban schools had a higher average percentage of NED student scores partially meeting ELA standards ($M=41.17$, $SD=3.74$) than did suburban schools ($M=33.75$, $SD=7.61$), $t(16)=-3.03$, $p=0.008$. Urban schools also had a higher average percentage of NED student scores not meeting ELA standards ($M=9.50$, $SD=2.43$) than did suburban schools ($M=5.00$, $SD=1.71$), $t(22)=-5.25$, $p=0.00$ (See Table 3).

Table 3. T-Test Results for Student Scores on Next Generation MCAS in the Subject Area of English Language Arts for Students who are Not-Economically Disadvantaged and who are Economically Disadvantaged

Test Results	School type	N	Mean	Std. Deviation	t	Sig. (2-tailed)
ELA_NED_E	1	12	9.50	4.101	2.26	0.039
	2	12	6.58	1.782		
ELA_NED_M	1	12	52.00	5.862	4.62	0
	2	12	42.67	3.822		
ELA_NED_PM	1	12	33.75	7.605	-3.032	0.008
	2	12	41.17	3.738		
ELA_NED_NM	1	12	5.00	1.706	-5.249	0
	2	12	9.50	2.431		
ELA_ED_E	1	12	3.17	1.467	2.328	0.034
	2	12	2.08	0.669		
ELA_ED_M	1	12	34.17	5.391	5.508	0
	2	12	25.25	1.545		
ELA_ED_PM	1	12	48.42	4.461	-1.55	0.138
	2	12	50.75	2.701		
ELA_ED_NM	1	12	14.17	2.691	-7.208	0
	2	12	21.92	2.575		

1= Suburban
2= Urban
ED= Economically Disadvantaged
NED= Not Economically Disadvantaged
E= Exceeding
M= Meeting
PM= Partially Meeting
NM= Not Meeting

This paragraph will provide results to independent sample T-tests, comparing student ELA achievement averages for ED students across urban and suburban schools during the three-year cycles observed. Suburban schools had a higher average percentage of ED student scores exceeding ELA standards on the Next Generation MCAS (M=3.17, SD=1.47) than did urban schools (M=2.08, SD=0.67), t(15.4)=2.33, p=0.034. Suburban schools also had a higher average percentage of ED student scores meeting ELA standards (M=34.17, SD=5.39) than did urban schools (M=25.25, SD=1.55), t(12.8)=5.51, p=0.00. When comparing the average percentages of ED student scores partially meeting ELA standards in suburban schools (M=48.42, SD=4.46)

and urban schools (M=50.75, SD=2.70) the data finds no significant association, t(18)=-1.55, p=0.138. When examining ED student scores not meeting ELA standards, urban schools had a higher average percentage (M=21.92, SD=2.58) than did suburban schools (M=14.17, SD=2.69), t(22)= -7.21, p=0.00 (see Table 3).

The subsequent section will supply the results to independent sample T-tests, comparing student math achievement averages for NED students across urban and suburban schools during the three-year cycles observed. Comparing the average percentages of NED student math scores exceeding math standards in suburban schools (M=8.50, SD=4.19) and urban schools (M=6.42, SD=1.98) the data shows no significant association, t(15.7)=1.56, p=0.139. Suburban schools did show a higher average percentage of NED student scores meeting math standards (M=48.83, SD=10.00) than did urban schools (M=41.25, SD=5.46), t(17)=2.31, p=0.034. The data shows no significant association between the average percentage of NED student math scores partially meeting math standards in suburban schools (M=36.75, SD=10.41) and urban schools (M=42.33, SD=4.50), t(15)=-1.71, p=0.109. Urban schools had a higher average percentage of NED student scores not meeting math standards (M=10.08, SD=2.78) than did suburban schools (M=6.08, SD=3.45), t(22)=-3.13, p=0.005 (see Table 4).

Table 4. T-Test Results for Student Scores on Next Generation MCAS in the Subject Area of Mathematics for Students who are Not-Economically Disadvantaged and who are Economically Disadvantaged

Test Results	School type	N	Mean	Std. Deviation	t	Sig. (2-tailed)
MTH_NED_E	1	12	8.50	4.189		
	2	12	6.42	1.975	1.558	0.139
MTH_NED_M	1	12	48.83	9.998		
	2	12	41.25	5.463	2.306	0.034
MTH_NED_PM	1	12	36.75	10.411		
	2	12	42.33	4.499	-1.705	0.109
MTH_NED_NM	1	12	6.08	3.450		
	2	12	10.08	2.778	-3.128	0.005
MTH_ED_E	1	12	2.42	1.379		
	2	12	1.92	0.793	1.089	0.288
MTH_ED_M	1	12	29.42	8.512		
	2	12	23.17	3.538	2.349	0.033
MTH_ED_PM	1	12	50.83	4.877		
	2	12	50.58	1.929	0.165	0.871
MTH_ED_NM	1	12	17.25	6.369		
	2	12	24.50	3.754	-3.397	0.003

1= Suburban 2= Urban
ED= Economically Disadvantaged
NED= Not Economically Disadvantaged
E= Exceeding
M=Meeting
PM= Partially Meeting
NM= Not Meeting

This paragraph will provide results to independent sample T-tests, comparing student math achievement averages for ED students across urban and suburban schools during the three-year cycles observed. The data shows no significant association between the average percentage of ED student scores exceeding math standards on the Next Generation MCAS in suburban schools (M=2.42, SD=1.38) and urban schools (M=1.92, SD=0.79), t(22)=1.09, p=0.288. Suburban schools did have a higher average percentage of ED student scores meeting math standards (M=29.42, SD=8.51) than did urban schools (M=23.17, SD=3.54), t(14.7)=2.35, p=0.033. When comparing the average percentages of ED student scores partially meeting math

standards in suburban schools (M=50.83, SD=4.88) and urban schools (M=50.58, SD=1.93) the data finds no significant association, t(14.4)=0.17, p=0.871. Urban schools had a higher average percentage of ED student scores not meeting math standards (M=24.50, SD=3.75) than did suburban schools (M=17.25, SD=6.37), t(22)=-3.40, p=0.003 (see Table 4).

The data provided supports the hypothesis that the average percent of NED student scores meeting and exceeding standards is higher than that of ED student scores across school type. This data also supports the hypothesis that there is a significant difference between student test scores, in ELA and math on the Next Generation MCAS, in urban and suburban schools. Across ELA scores, the data shows that suburban schools consistently had higher average percentages of both NED and ED student scores that were exceeding and meeting ELA standards. The ELA data also showed that urban schools had a higher average percentage of both NED and ED student scores that were partially meeting and not meeting ELA standards, with the exception of ED students partially meeting which did not show a significant association. Math data showed no significance for NED or ED student scores either exceeding or partially meeting standards. This data did show that suburban schools consistently had higher percentages of both NED and ED student scores meeting math standards, and that urban schools had higher percentages of both student groups' scores not meeting math standards.

Summary of Results

During the three year-cycles observed, teacher retention shows a negative correlation with "all students," White, and Latinx student test scores not meeting test standards. The data also show that teacher retention was positively correlated with "all students," White, and Latinx student test scores meeting test standards. This means that in schools where more teachers are retained, more students in the mentioned ethno-racial groups are meeting test standards. In

schools that experience more teacher turnover, more students in these same groups are not meeting test standards. However, it should be noted that Black student test scores did not show any statistically significant correlations with teacher retention. This result does not necessarily mean that Back students are completely unaffected by teacher retention, but rather that other factors may influence their test achievement.

Looking at the correlational tests across student SES, there is a consistently negative correlation between teacher retention and non-economically disadvantaged (NED) student scores not meeting test standards in both ELA and mathematics. There is also a positive correlation between teacher retention and NED student scores meeting test standards. This means that at schools that retain more teachers, more NED students meet standards on the Next-Generation MCAS. At schools that experience more teacher turnover, more NED students are not meeting test standards, and vice versa. Economically disadvantaged student scores show only one statistically significant correlation with teacher retention. During year-cycle 1, in the area of mathematics, teacher retention is significantly negatively correlated with ED student scores partially meeting test standards. While this result was hypothesized, it only appears once; meaning that there may be other factors that are influencing the test achievement of ED students in Massachusetts' schools.

The results of the T-tests indicate that suburban schools in Massachusetts consistently have higher averages of student test scores exceeding and meeting ELA and math standards on the Next Generation MCAS than do urban schools in the state. With this, urban schools in Massachusetts prove to have higher averages of student test scores partially meeting and not meeting test standards in both subject areas observed. Such results were consistent across all ethno-racial groups, with the exception of 11 of the 46 variables which showed no significant

association. This means that suburban schools in the state are achieving higher test scores on average than urban schools regardless of student race and socioeconomic status. However, it is important to note that urban schools are typically made up of more Black and Latinx students, as well as low-income students, than are suburban schools. So, urban schools have more students of color and students of low SES, as well as more student scores falling below state test standards than do their suburban counterparts.

In addition to this insight, the T-Tests' data also reveals information about student scores in each category of achievement on the Next-Generation MCAS, by student race. When analyzing the differences in mean percentages of student scores in each category of achievement (exceeding, meeting, partially meeting, not meeting), several important patterns are observed. In the area of ELA, the percentages of white student scores exceeding and meeting test standards are consistently higher than every other demographic studied including "all students." The average percentages of White student scores partially meeting and not meeting standards are also the lowest of the groups studied. While average percentages of Black student scores exceeding in suburban schools are the lowest of all groups shown, average percentages of Latinx student scores exceeding and meeting prove to be the lowest in the urban school sector. This pattern remains across the classifications of partially meeting and not meeting ELA test standards. Black students have the highest average percentage of student scores partially meeting test standards in ELA than any other group observed. The average percentages of Latinx student scores partially meeting and not meeting standards are the highest in urban schools. The mean percentage of Latinx student scores not meeting ELA standards are also the highest of all studied groups in suburban schools.

According to the data for mathematics, similar to that of the ELA data, white student scores have a higher average percentage of student scores exceeding and meeting test standards in both urban and suburban schools than do “all students,” Black students, and Latinx students, with the exception of “all students” having a higher average percentage of score exceeding standards in suburban schools. White student scores also have a lower percentage of student scores partially meeting and not meeting standards than the three other groups observed. Percentages of Black student scores exceeding and meeting test standards in suburban schools are the lowest of all ethno-racial demographics observed in the area of mathematics. Whereas percentages of Latinx student scores exceeding and meeting test standards in urban schools are the lowest of the groups studied.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS, AND LIMITATIONS

The first research sub-question researchers sought to answer was: “How is teacher retention in urban and suburban public-school districts in Massachusetts associated with the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?”. I hypothesized that teacher retention is positively correlated with white, Black, and Latinx student scores which are exceeding and meeting ELA and math test standards on Next Generation MCAS; and teacher retention is negatively correlated with the student scores across ethno-racial groups partially meeting and not meeting ELA and math test standards. The data provided supports this hypothesis. Researchers hypothesized that teacher retention would have a stronger correlation for students of color than it does for white students. The data do not support this hypothesis.

The second research sub-question reads: “How is teacher retention in urban and suburban public-school districts in Massachusetts associated with the achievement of students who are economically disadvantaged and non-economically disadvantaged on the Next-Generation MCAS state standardized test in the areas of English Language Arts and Mathematics?” I hypothesized that teacher retention is positively correlated with NED and ED student scores which are exceeding and meeting ELA and math test standards on Next Generation MCAS; and teacher retention is negatively correlated with the student scores across student SES groups partially meeting and not meeting ELA and math test standards. The data support this hypothesis. However, I also hypothesized that teacher retention would have a stronger correlation for ED

students than it does for NED students. The results from the correlational tests performed do not support this hypothesis.

The next research sub-question reads: “What is the relationship between school region type in Massachusetts and the achievement of students who are White, Black, and Latinx on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?” I hypothesized that white student scores would be higher than those of Black and Latinx students across school type. The data from the T-tests performed supports this hypothesis. White student scores are higher on average than “all students,” as well as Black and Latinx students in both ELA and math on the Next Generation MCAS regardless of school type. The mean scores of Black students are also higher than the average Latinx student scores in the urban school sector, while Latinx student scores are higher than the average Black student scores in suburban schools (with the exception of Black student scores meeting and not meeting ELA standards). While this data does not show an impact of school region type on the achievement of white students, it does show a relationship between school type and the achievement of Black and Latinx students.

The final research sub-question reads: “What is the relationship between school region type in Massachusetts and the achievement of students who are economically disadvantaged and non-economically disadvantaged on the Next-Generation MCAS standardized test in the areas of English Language Arts and Mathematics?” I hypothesized that the data would show a higher average percent of non-economically disadvantaged (NED) student scores that are exceeding or meeting test standards on Next Generation MCAS, in the areas of both ELA and math, than their economically disadvantaged (ED) peers across both urban and suburban schools. The data from the T-tests performed supports this hypothesis. T-test results show that NED students have

higher average percentages of students exceeding and meeting ELA and math standards on Next Generation MCAS than do ED students across both suburban urban schools in Massachusetts. Therefore, the data does not show school region type having an impact on test achievement dependent on student SES. It was also hypothesized that suburban schools would show more student scores on average that are exceeding or meeting test standards than urban schools. The data from this study also supports this hypothesis. Regardless of student SES, the T-tests show that suburban schools have higher average percentages of student scores exceeding and meeting test standards in both subject areas observed.

The results from this study show that public school student success in Massachusetts is being impacted by teacher turnover, as well as a race and wealth gap. The data find that as teacher retention increases, the percentage of students (regardless of demographic) meeting and exceeding Next Generation MCAS standards is increasing; as teacher retention decreases, the percentage of students partially meeting and not meeting test standards is increasing. The implications of these findings are that, although Massachusetts public schools have one of the higher teacher retention rates in the country, policy makers and educational leaders need to make efforts to support teachers in the workplace and boost retention efforts. This must be done by rectifying some of the grievances teachers are reporting; including appropriate compensation and professionalization of the field.

This study also found that there are higher percentages of white student scores and NED student scores which are meeting or exceeding state test standards, than there are for the scores of students of color and the scores of ED students. With these findings, and the data supporting suburban schools outperforming urban schools, it is evident that there is a race and wealth achievement gap in Massachusetts public schools. Students of color may be facing prejudice and

discrimination in schools, which is impacting their learning and success in the classroom. Furthermore, students who are economically disadvantaged may be facing difficulty with lack of resources outside of school, and less access to familial support due to work and financial impacts at home. Therefore, it is imperative that policymakers and public-school leaders reanalyze the distribution and allocation of funding across the public-school sector and consider programs which help mitigate the gaps occurring. Such programs may include diversity and inclusion training, research, and discussion around the causes of the achievement gap and how to close it, and student support such as after school programs, tutoring, mentorship programs, and community engagement.

The current study analyzes teacher retention and student achievement data on Next Generation MCAS across three year-cycles from 2016-2019. While teacher attrition and retention are issues across the country, the current study is limited to a sampling from only one Northeastern state. Therefore, the study does not include data from any states with lower retention rates, nor does it contain any data comparing Massachusetts to other high teacher retention states. Future studies may extend this research by including a comparison of a state with a higher average rate of teacher turnover.

The present study also only includes student achievement data for three school years. This is because the state of Massachusetts has changed their standardized test several times in the past decade, leaving little consistency in the data collected. In future research, it would be helpful to include student achievement results from five or more years of testing.

As the COVID-19 pandemic has made significant changes to the operation of public schools throughout the country, future researchers may find it beneficial to investigate the relationship between school region types and student achievement from pre-pandemic years into

the 2019-2021 school years. As states and districts implemented different modes of teaching (in-person, hybrid, and virtual), students in different regions received different qualities of education during the pandemic. With differing resources in urban and suburban schools, future research on the impacts of the pandemic may be beneficial to understanding the ramifications of different schooling policies. This information can be helpful in reforming policies in place should COVID-19 or future pandemics continue to impact the educational system in the United States.

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VITA

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While at Loyola, O'Leary represented the university while presenting her research in the area of philosophy of education at the 2018 Ohio Valley Philosophy of Education Symposium (OVPES). Currently, O'Leary is a Developmental Specialist working in Early Intervention at Associates for Human Services (AHS), serving the communities of southeastern Massachusetts. In addition to her work within the community, O'Leary also serves as a committee member for the Diversity Committee at AHS.