

South Carolina Teacher Retention Rates for the 2020-2021 Academic Year: One-Year and Three-Year Averages

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Teacher Retention in South Carolina

+ HIGHLIGHTS

To better understand the state of teacher retention in South Carolina, we investigated school-level factors associated with the one-year and three-year average teacher retention rates at the start of the 2020-2021 academic year. Results are based on analysis of data collected from 1,178 public schools in 88 school districts across South Carolina.

Main findings regarding 2020-2021 retention rates of South Carolina teachers

- Teacher retention rates were significantly related to teacher salary, school climate (satisfaction with school safety, student behavior, and home-school relationships), the level of poverty in the student population, and the number of years the principal had served at the school. High schools exhibited the highest teacher retention rates, and middle schools possessed the lowest teacher retention rates. However, the organizational level was not a primary factor for teacher retention.
- Of the school-level factors, the level of school poverty demonstrated the highest relationship with teacher retention. High-poverty schools had significantly lower teacher retention rates compared to schools with a less disadvantaged student population.
- Overall, principal tenure was positively related to teacher retention, but the relationship was not consistent across school organizational levels. Teacher retention rates were related to principal tenure in elementary and middle schools but not in high schools.
- School location was not strongly related to teacher one-year retention rates but was more strongly associated with the three-year average teacher retention rates. In both elementary and middle schools, teacher retention rates were lowest among schools based in cities.
- For variables studied, school-level factors generally showed stronger relationships with three-year retention rates.

Recommendations to improve teacher retention in South Carolina

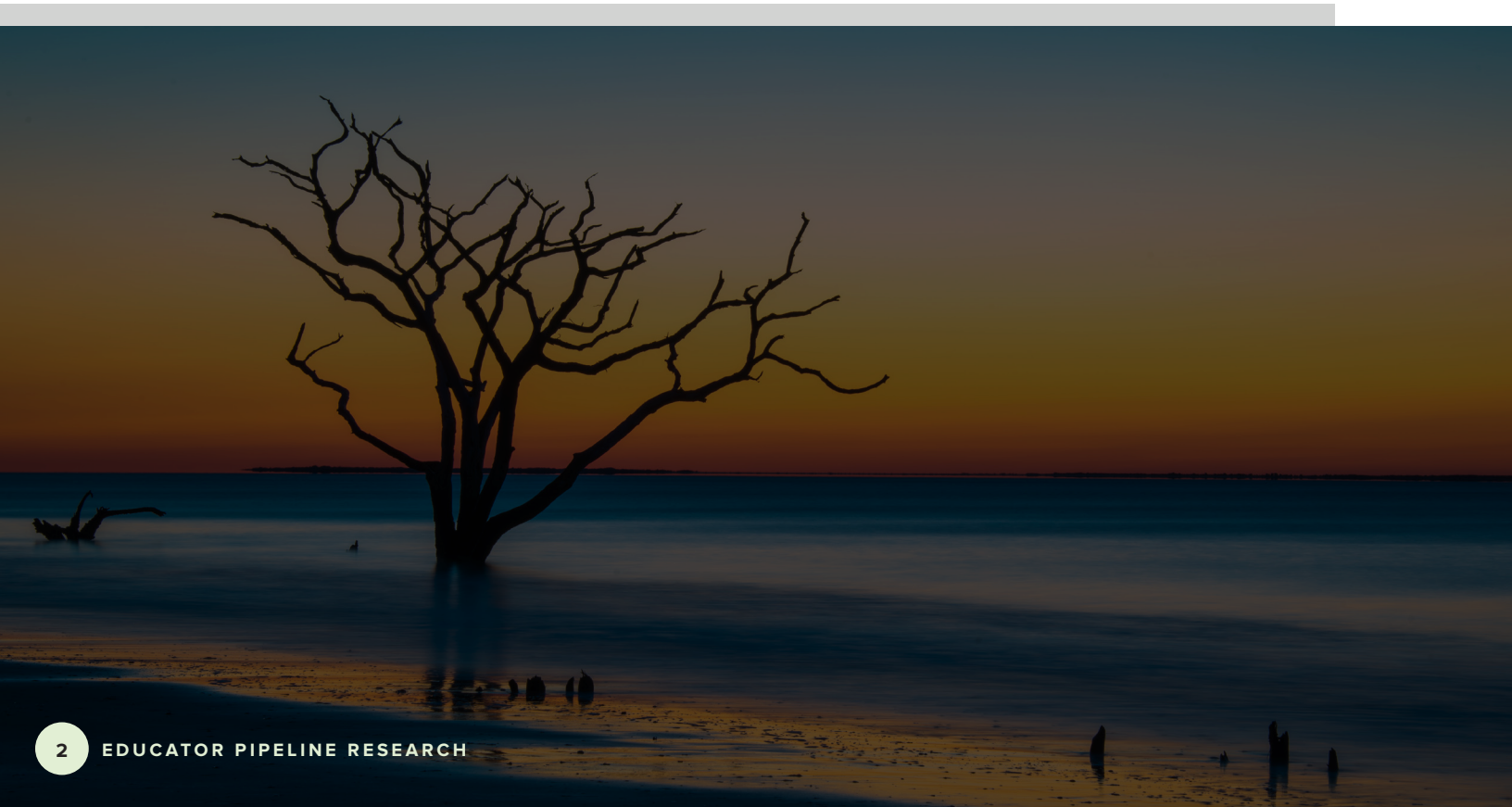
- Factors such as principal longevity and a positive school climate may help alleviate teacher stress, promote collegiality, and encourage teacher retention in South Carolina, especially for schools serving students at higher poverty levels.
- As high school teachers in South Carolina demonstrated the highest retention rates, investigation of high school teachers could be helpful in determining unique factors to retain teachers that can be applied in middle and elementary school environments.
- Across the nation, the COVID-19 pandemic elevated teacher burnout and stress, leading to higher turnover rates. Studying South Carolina teachers' levels of burnout and stress might help understand the impact of the pandemic on our educator workforce.

+ INTRODUCTION

Teacher turnover is one of the main issues facing public education. When teachers remain in their schools, the entire educational community – students, fellow teachers, and administrators – reap the benefits. The National Center for Education Statistics (2016) found a total annual turnover rate of 16%, where on average, 8% of teachers leave the teaching profession each year and 8% of teachers move to different schools. Analyses of the 2012 Schools and Staffing Survey and the 2013 Teacher Follow-up Survey illustrated that the variation in turnover comes from multiple factors (Carver-Thomas & Darling-Hammond, 2017) such as location, discipline taught, and students' background. Turnover rates were found to be highest in the South (16.7%), especially as compared to the Northeastern United States (10.3%). Teachers in specific fields are more likely to leave their school or the profession, notably teachers in mathematics, science, special education, English language development, and foreign languages. Turnover rates are higher for teachers in high-poverty schools and schools serving more students of color, and this is particularly pronounced among mathematics and science teachers, and teachers holding alternative certifications. Both high-poverty

schools and schools with large concentrations of students of color tend to be staffed by less experienced teachers and often teachers with less formal teacher training.

The Learning Policy Institute also utilized the 2012 Schools and Staffing Survey and 2013 Teacher Follow-up Survey to uncover teachers' primary reasons for leaving their school or leaving the profession altogether (Carver-Thomas & Darling-Hammond, 2017). Teachers who felt strongly that their school administration was unsupportive were more than twice as likely to leave their school compared to teachers who felt supported. The most frequently cited reason for leaving the teaching profession (noted by 25% of educators) was dissatisfaction with pressures from testing and accountability. Teachers leaving the field also cited dissatisfaction with teaching as a career, including unfavorable teaching assignments, lack of influence on school decision-making, and lack of opportunities for advancement. Teachers additionally noted dissatisfaction with their working conditions, including large class sizes and a lack of resources.



The arrival of the COVID-19 pandemic heightened the difficulties surrounding teacher retention. After nationwide closures in the spring of 2020, schools reopened for the 2020-2021 academic year with many teachers being required to educate students using multiple modalities, including in-person, hybrid, and virtual instruction.

This multiple modalities requirement meant teachers had to adapt to unexpected and changing conditions, remain flexible through synchronous and asynchronous instruction, and endure greater isolation from students, parents, and colleagues.

The Brookings Institution surveyed teachers in March 2021 and found that most teachers (71%) had to switch instructional mode during the 2020-2021 academic year at least once, and the average teacher changed modalities twice (Zamarro et al., 2021). These adaptations, coupled with personal/familial health concerns, resulted in high levels of stress and burnout among teachers (Diliberti et al., 2021). A RAND Corporation survey in January 2021 revealed that nearly 25% of teachers indicated a desire to leave their job at the end of the 2020-2021 school year (Steiner & Woo, 2021). Additionally, a 2022 survey conducted by the National Education Association (NEA) found that 55% of educators plan to leave the profession sooner than they had expected, largely due to stressors brought about by the pandemic (GBAO Strategies, 2022). While teachers continue to cite low pay as a reason for leaving, the NEA's most recent survey revealed new COVID-related reasons, including general stress from the pandemic and lack of respect from the public and parents. Most alarming, the survey showed that burnout is a critical issue in today's schools, affecting 9 out of 10 educators.





COSTS ASSOCIATED WITH TEACHER TURNOVER

Teacher turnover is costly in many ways. It is an added expense to school districts, as new teachers must be recruited and trained. The cost for every teacher that leaves their position ranges from \$9,000 in rural areas to \$21,000 in urban areas.

Additionally, high turnover creates instability and consequently makes improvements difficult to implement (Carver-Thomas & Darling-Hammond, 2017). Experienced teachers are familiar with the needs of the community, the school, and the students and are best positioned to provide guidance to meet the needs of various stakeholders. When these teachers leave, administrators lose valuable feedback on the success and/or failure of school and community improvement initiatives.

Poor teacher retention has been shown to negatively impact students' academic achievement (Carver-Thomas & Darling-Hammond, 2017). Sorenson and Ladd (2020) showed that high teacher turnover resulted in significant declines in school performance among middle school students, particularly in mathematics and reading. Further, retention disparities can lead to differences in public education that can disproportionately affect subgroups of students. Alderman et al. (2021) demonstrated that 15% of the variation in teacher turnover rates across schools could be explained by three variables: the urbanicity of the school, the percentage of students in the school receiving free or reduced lunches, and the percentage of underrepresented minority students (defined as Native American, Black, and Hispanic students). Nationally, turnover rates tend to be lowest in schools situated in a town,¹ and teacher turnover was highest in schools that serve a large percentage of underrepresented minority students or students eligible for free or reduced lunches.



KEY QUESTIONS

Teacher retention is essential to the success of the educational system, leading to greater investment in resources, positive student outcomes, and stronger policy development (Carver-Thomas & Darling-Hammond, 2017). If fewer teachers leave the classroom, schools may invest money slated for recruitment and training into addressing other needs, such as improved facilities, technology, and professional development. Besides reducing recruitment costs, increasing teacher retention can result in more experienced teachers in the classroom, fostering improved student achievement and supporting greater equity across the public education system.

Given the status of teacher retention and the unique conditions caused by the COVID-19 pandemic, the goal of this study is to explore school-level factors associated with teacher retention in South Carolina for the 2020-2021 academic year. We examine the following key questions regarding teacher retention for South Carolina educators:

1. What is the relationship between teacher retention in South Carolina and school-level variables?
2. How do South Carolina teacher retention rates differ among school organizational levels (i.e., elementary, middle, and high school)?
3. Within organizational levels, do South Carolina teacher retention rates differ:
 - a. by school poverty level?
 - b. depending upon the length of the principal's tenure?
 - c. depending on the geographic location of the school?

Through this study, we hope to gain greater understanding of school-level factors important to retention of South Carolina teachers.

¹ NCES definition of a town is a population between 2,500 up to 50,000 citizens inside an urbanized cluster that is at least 10 miles from an urban area (population $\leq 50,000$)



DATA, VARIABLES, AND ANALYSES

Report findings were based on an analysis of data collected from 1,178 public schools in 88 school districts in South Carolina. Retention rates were compared with School Report Card data and School Climate survey data obtained from the South Carolina Department of Education (SCDE). Every effort was made to include as many schools as possible to provide a census of the state's teaching workforce. In addition, where possible, findings from the current report were compared to previous results from the SC-TEACHER 2018-2019 Teacher Retention Rate report (Fan et al., 2020).

The focal variable, teacher retention, was defined by the percentage of South Carolina educators renewing a teaching contract to return to the classroom for the 2020-2021 academic year. For the one-year retention rate, the Compensation Report of SC Educators was used to determine the number of teachers who were teaching in the same school in both 2019-2020 and 2020-2021. The one-year retention rate for each school represents the number of educators teaching at the same school in 2019-2020 and 2020-2021 divided by the total number of teachers assigned to the school in 2019-2020. The three-year average retention rate represents the average one-year retention rate at the school for the current year (2020-2021) and the previous two years (2018-2019 and 2019-2020).

Nine report card variables were examined. Six variables reported characteristics of the school: 1) average teacher salary, 2) student enrollment (school size), 3) the number of principal years at the school, 4) student-teacher ratio, 5) school poverty index, and 6) total per pupil expenditure. Three additional school climate variables provide an overview of teachers' level of satisfaction with the school environment, home-school relationships, and the social-physical environment of the school. For all variables, higher levels represent more of the characteristic studied (e.g., higher salary, more pupils in poverty, higher satisfaction, etc.). We note that missing data were prevalent in the 2019-2020 datasets due to COVID-19 school closings in spring 2020; however, all available data were included in every analysis to provide as complete findings as possible. An additional variable, school location, was included. Location was constructed by matching each school's physical address to a location code used by the National Center for Educational Statistics (NCES, 2006) to classify geographical locations as rural, town, suburban, or city. These classifications were determined by population densities and the proximity to urban areas.

As many of the results discuss findings by school organizational level, it is helpful to gauge the number of schools within each level. South Carolina's public schools are organized into levels, largely according to the grade level(s) taught in the schools. The organizational level of the school was determined according to the guidelines used in the South Carolina 2020-2021 School Accountability Manual. Of the 1,178 South Carolina Schools summarized here, results include 587 elementary schools (grades K through 5), 231 middle schools (grades 6 to 8), and 206 high schools (grades 9 through 12). In addition, South Carolina public schools include 154 schools of unique organizational groupings, preschools/child development centers, virtual schools, charter schools, schools of combined levels (e.g., preschool through middle school), and schools serving students with special needs. The unique school groups were removed from analyses due to small sample sizes by category and to facilitate discussion across the three main organizational levels: elementary, middle, and high schools. Analyses, including the largest categories of unique schools, preschools, and combined-level schools, can be found in the Appendix.

Descriptive statistics, correlation coefficients, and statistical tests of mean differences (i.e., analysis of variance) were used to examine the report's guiding questions. This report provides a discussion of the statistical results. For each key question, we provide the following: 1) a summary of the current one-year and three-year retention rates, 2) a discussion of results over time by comparing current results to findings from the previous (2018-2019) SC-TEACHER Teacher Retention Rate report, and 3) comparison of South Carolina results to published research findings. A detailed, technical description of all research activities, including in-depth descriptions of statistical analyses, significance levels, and effect size coefficients, can be found in the Appendix materials.



Our Key Questions



+ KEY QUESTION 1:

What is the relationship between teacher retention rate in South Carolina and school-level variables?

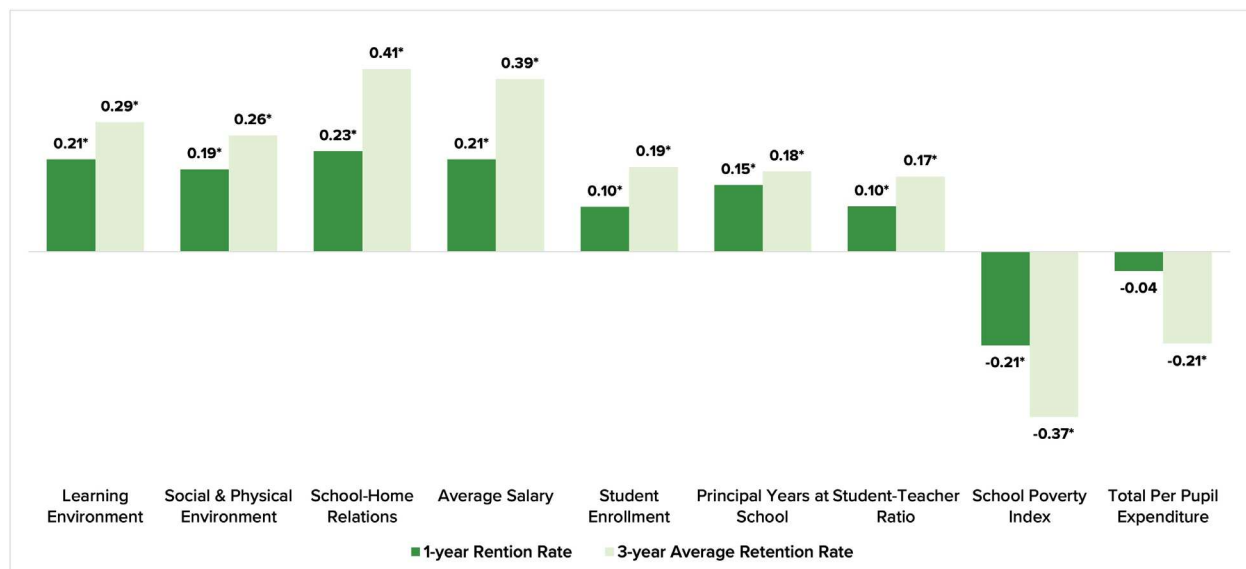
To address Key Question 1, we examined correlation coefficients between teacher retention and school report card variables. Correlation values range from a low of 0 to a high of 1, with the sign of the coefficient (positive or negative) indicating the direction of the relationship. As the sample size is large, we focused on values of .30 or higher (irrespective of the direction of the relationship), demonstrating an important relationship between a given factor and teacher retention in South Carolina.

2020-2021 Teacher Retention Rates by School Factors

Correlation coefficients were computed by organizational level for the one-year and three-year retention rates; results are provided in bar graphs with the correlation above or below the bar. School poverty rate and total expenditure per pupil yielded negative relationships with teacher retention, meaning higher poverty or total pupil expenditures are associated with lower retention. Relationships between teacher retention and all other variables were positive.

A similar pattern was observed for one-year and three-year retention rates. Overall, relationships were stronger over a three-year period, illustrating fluctuations affecting teacher retention rate for a one-year average. One-year and three-year retention rates are provided in Figure 1; tables are provided in the Appendix.

Figure 1. *Correlations Between the One-year and Three-year Teacher Retention Rates and School Factors for All Organizational Levels (n = 1178)*



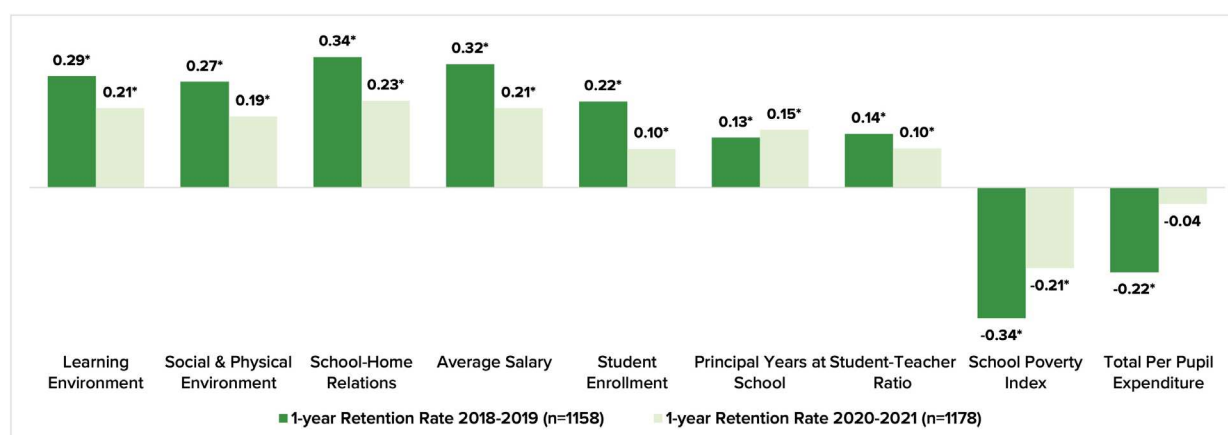
Note. *Result is significant at the .05 level.

Generally, higher teacher salaries, increased satisfaction with the learning environment, and better home-school relationships were related to higher teacher retention rates (correlation values $\geq .30$). Higher satisfaction levels with the social and physical environment were also related to higher retention levels. Conversely, the student-teacher ratio, student enrollment, and principal tenure did not have a strong relationship with retention rates.

Retention Rate Comparison Across Time by School Factors

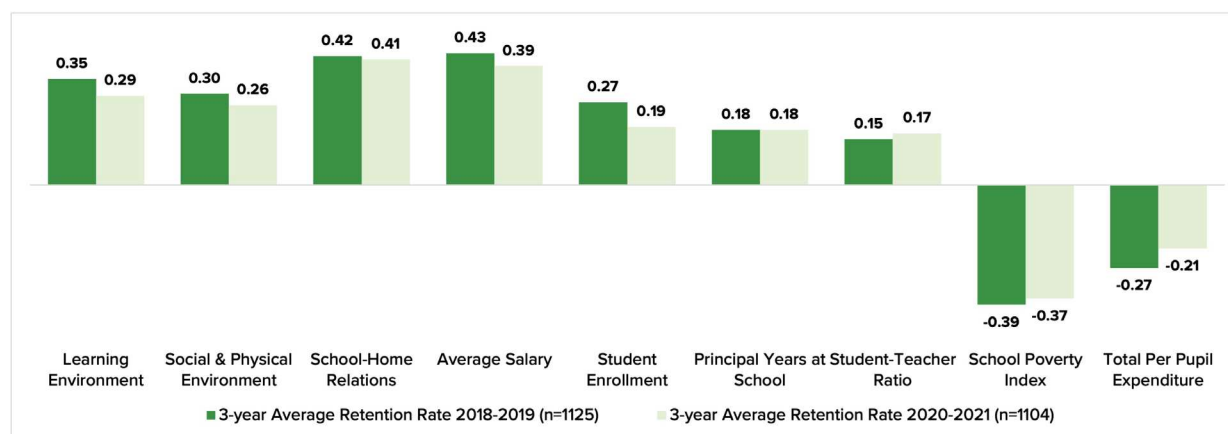
A longitudinal analysis examined differences in South Carolina teacher retention rates since the 2020 SC-TEACHER report². We computed correlation coefficients between the school report card variables and 2020-2021 one-year teacher retention rates and three-year average retention rates across all organizational levels. To facilitate discussion of longitudinal trends, analyses were conducted over all South Carolina schools, as in Figure 1.

Figure 2. Longitudinal Comparison of Relationships Between the One-year Teacher Retention Rate and School Factors for All Organizational Levels



Note. *Result is significant at the .05 level.

Figure 3. Longitudinal Comparison of Relationships Between the Three-year Teacher Retention Rate and School Factors for All Organizational Levels



Note. *Result is significant at the .05 level.

The general pattern of relationships between retention and school factors is consistent between the reports; however, when making comparisons using the one-year retention rates, the magnitude of all relationships was stronger in 2018-2019 as compared to the correlations identified in 2020-2021. Before the pandemic, school factors demonstrated a stronger relationship (by roughly 1.10x) with teacher retention for most variables; only principal years at the school and the student-teacher ratio demonstrated similar one-year retention rates across both reports. The correlations based on the three-year retention rates were much more similar between the two reports.

² Note: Relevant values are included here for longitudinal comparison. The full 2020 Teacher Retention report may be found on the SC-TEACHER website at sc-teacher.org.

Relationship Between South Carolina Teacher Retention Rate Findings and Published Studies, by School Factors

Concerning the various school factors, results from South Carolina teacher retention rates are similar to findings from other researchers across the country. Related work concerning two school factors – principal tenure and student poverty level – are discussed later in the report in more detail; concordance between results and remaining school factors (school climate, teacher salary, student enrollment, student-teacher ratio, and student expenditures) are discussed here.

School climate has been identified as important to teacher retention, with a positive relationship between teacher retention rates and teachers' satisfaction with their school environments. Ingersoll (2001) indicated that teachers' job dissatisfaction had a large association with teacher turnover. Kukla-Acevedo (2009) found that the first-year teachers' mobility decisions had strong associations with behavioral climate, highlighting the importance of a safe, healthy, positive, and welcoming school climate to promote teacher retention. Similarly, undesirable working conditions in school environments – behavioral problems, lack of support, and poor relationships with parents/caregivers – can lead to teachers' dissatisfaction and result in teacher attrition (Johnson & Birkeland, 2003; Kelly, 2004; Stockard & Lehman, 2004).

Teacher salary has been studied broadly. For example, Gray and Taie (2015) found that teachers with higher beginning salaries were more likely to stay than teachers who began with lower starting salaries. Bueno and Sass (2019) studied Georgia's bonus system in teacher recruitment and retention and found that bonuses reduced teacher attrition by 18 to 28%. In general, higher compensation has been found to encourage teachers to remain in the profession.

Finally, student enrollment characteristics have been found to have varying relationships with teacher retention. For example, Geiger and Pivovaro (2018) found that teachers in high-enrollment schools were more likely to be retained, as these teachers were significantly more pleased with school facilities and resources compared to teachers in schools with lower enrollment. Class size (similar to the student-teacher ratio used here) has not been found to be a significant factor in prior research (e.g., Nguyen et al., 2019; Sorenson & Ladd, 2020); these findings are in accordance with findings from South Carolina teachers. Finally, prior research has noted a similar inverse relationship between per-pupil expenditure and teacher retention (Wheeler-Bass, 2018); however, this study examined expenditures at the district level in Mississippi and found poverty to be a mediating factor, as most of the high-poverty, high-minority districts receive large amounts of federal funds (leading to a higher per-pupil expenditure ratio). The findings in South Carolina also demonstrated a significant, negative relationship; however, the relationship varied depending on the grade level. Future investigations may take a closer examination of this finding in the South Carolina context.

+ KEY QUESTION 2:

How do South Carolina teacher retention rates differ by school organization level?

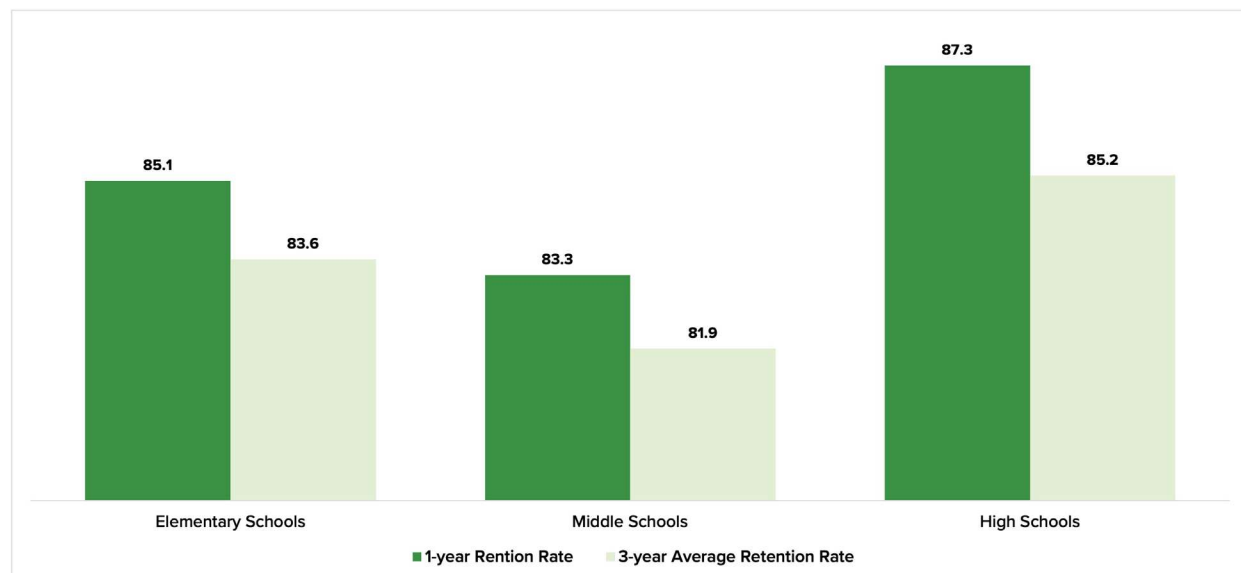
Average retention rates were compared across the three organizational levels (elementary, middle, and high school) using a one-way Analysis of Variance (ANOVA). Analyses were conducted separately for the one-year and three-year retention rates. A graphical summary of results is presented in Figure 4; detailed statistical results are provided in the Appendix.

2020-21 Teacher Retention Rates, by School Organizational Level

Teacher retention rates showed similar patterns across organizational levels; however, three-year retention rates were lower than the one-year rates for all organizational levels. Retention rates for South Carolina teachers ranged from roughly 83% - 87% for the one-year average and approximately 82% - 85% for the three-year average. Follow-up analyses showed that retention rates were significantly different among the three organizational levels, with South Carolina high schools reporting the highest retention rates in the state and middle schools reporting the lowest teacher retention rates.

The organizational level contributes only a small amount to explaining the teacher retention rate. However, it is noted that roughly 13% - 17% of South Carolina teachers did not renew their contract in 2020-2021; an approximate average of 15% -18% of South Carolina teachers did not return each year over the three-year period ending in 2020-2021.

Figure 4. Differences in Average Retention Rates for One-year and Three-year Rates, by Organizational Level

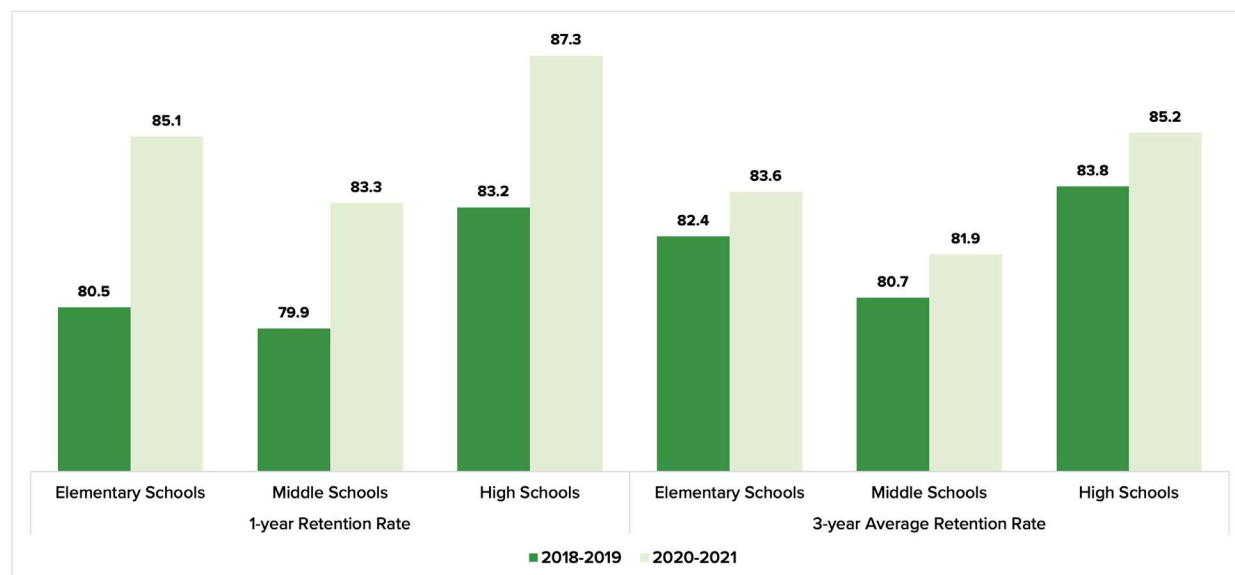


Note. Omnibus test is significant at the .05 level one-year and three-year retention rates. See the Appendix for pairwise comparisons between organization levels.

Retention Rate Comparison Across Time, by Organizational Level

To examine trends in South Carolina, Figure 5 provides a comparison of the one-year and three-year retention rates reported here and in the previous report for the 2018-2019 report. Retention rates are delineated by organizational level to identify potential differences.

Figure 5. Longitudinal Comparison of the Percentage of Teachers Retained Across Organizational Levels



Note. Omnibus test is significant at the .05 level for 2018-2019 and 2020-2021. See the Appendix for pairwise comparisons for 2020-2021.

Over time, retention rates showed a higher percentage of teachers returning for 2020-2021 than in 2018-2019, regardless of school organizational level, with both the one-year and three-year rates. Results across time appeared different for the one-year retention rate, with a difference of 3% to 5% across time. Differences over time were not as noticeable for the three-year retention rate, with differences in retention rates of roughly 1% - 2%. Overall, higher teacher retention rates for 2020-2021 suggest that more South Carolina teachers elected to return to their schools after COVID pandemic closures when compared to the academic year before the COVID-pandemic (2018-2019).

Considering the organizational level, the pattern was similar across time, with middle schools yielding the lowest teacher retention rate and high schools yielding the highest teacher retention rate. Findings showed the same pattern with teacher contract renewals in 2018-2019 as with 2020-2021.

Relationship Between South Carolina Teacher Retention Rate Findings and Published Studies, by Organizational Level

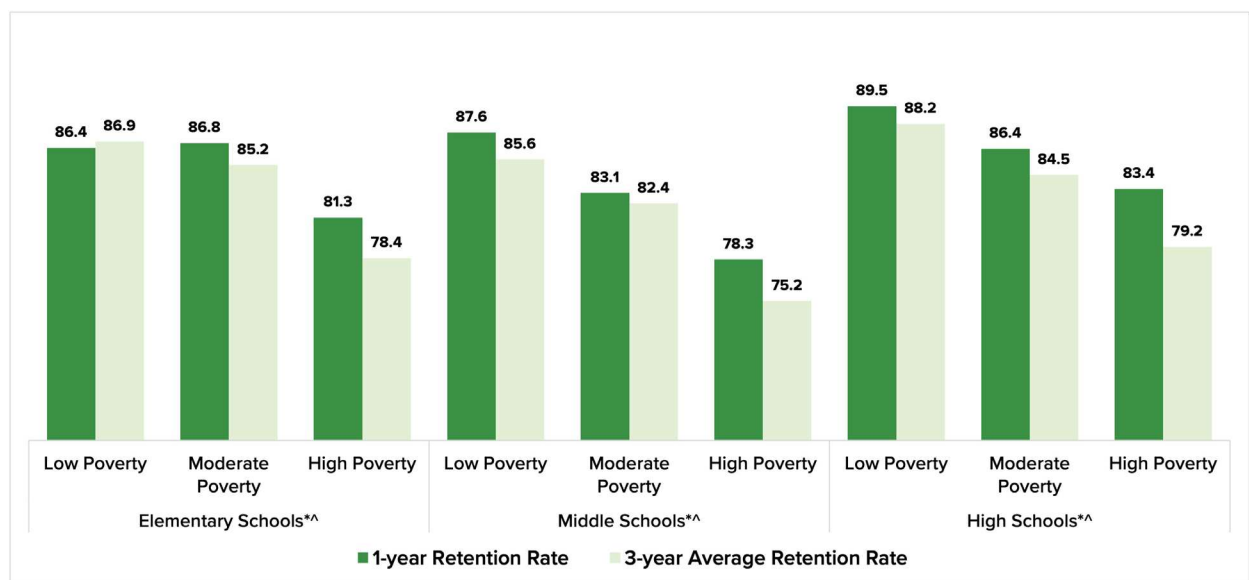
Significant differences were found in teacher retention between school organizational levels in this report of South Carolina teachers, but this relationship has not commonly been addressed in the literature on teacher retention. A study of teacher retention and mobility in the state of Washington (Elfers et al., 2017) found that high school teachers were more likely to exit the profession or move out of the district than elementary school teachers, opposite to the trend exhibited in this South Carolina study. However, the methodology in the Washington study was based on individual teacher trajectories, data that is not yet accessible for this report. Middle school teachers were found less likely to remain in teaching than high school teachers due to challenges associated with adolescence (Brill & McCartney, 2008). However, the Brill and McCartney paper was a review of literature with selected districts providing case studies.

+ KEY QUESTION 3A:

Among organizational levels, how do South Carolina teacher retention rates differ by school poverty level?

One-way ANOVAs were conducted to examine teacher retention rates by categories of school poverty. As a school's poverty index is continuous, ranging from 0 percent (no students at a school meet poverty guidelines) to 100 percent (all students at the school meet poverty criteria), the distribution of school poverty values was cut into quartiles. Schools with student poverty indices in the lowest quartile (ranked in the lowest 25%) were defined as low-poverty schools; schools with poverty indices in the highest quartile were defined as high-poverty schools. Schools ranked in the middle 50% of the poverty index rankings were considered moderate poverty schools. A graphical summary examining teacher retention across the three poverty categories (low, moderate, high) within each organizational level is presented in Figure 6.

Figure 6. Percentage of Teachers Retained Across School Poverty Categories, by Organizational Level



Note. *Omnibus test is significant at the .05 level for the one-year retention rate. ^Omnibus test is significant at the .05 level for the three-year average retention rate. See the Appendix for pairwise comparisons.

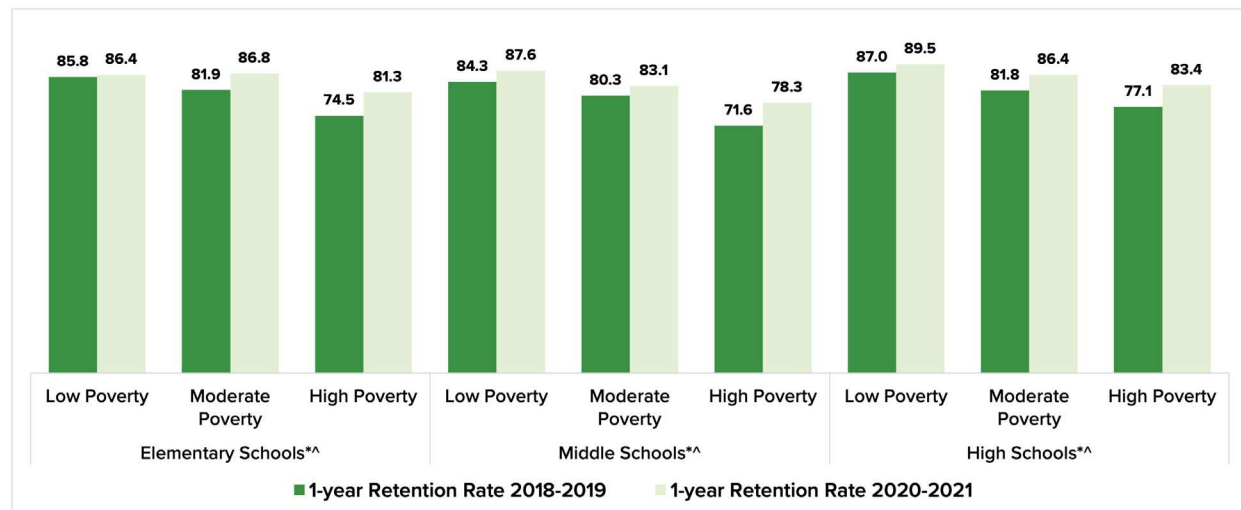
Analysis results yielded differences in teacher retention rates by the average poverty level. High-poverty schools in South Carolina demonstrated significantly lower teacher retention rates than low- and moderate-poverty schools. This pattern was repeated at all organizational levels. For South Carolina teachers, school poverty level played a moderate role in explaining the one-year retention rate but a large role in explaining average three-year retention rates. At each of the organizational levels, comparisons showed that differences were significant across poverty categories for both one-year and three-year retention rates.

The lowest levels overall were observed for high-poverty middle school teachers in South Carolina, with roughly 22% of teachers not returning for the 2020-2021 school year and an average of almost 25% of the teachers at those schools not renewing their contracts each year over the three-year period.

Retention Rate Comparison Across Time: School Poverty

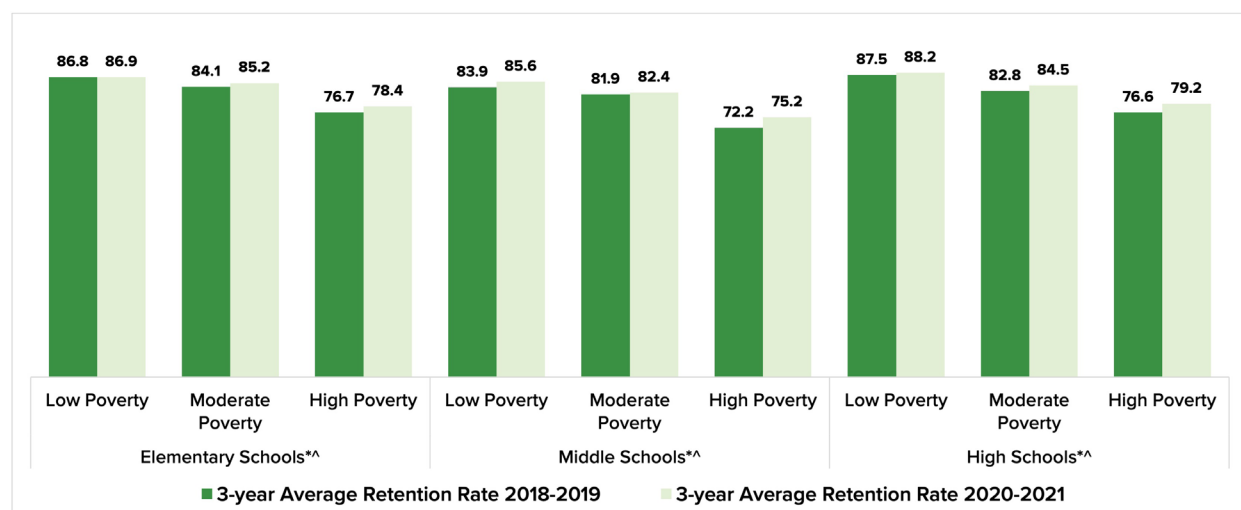
In the previous SC-TEACHER report, school poverty was collapsed by quartiles, resulting in comparison of four groups. The current report categorized school poverty into three groups, with a larger group of moderate poverty. Therefore, a direct comparison of results between the two reports is not available. However, we reorganized the 2018-2019 data into three groups to provide a longitudinal comparison of both the one-year (shown in Figure 7) and three-year (shown in Figure 8) retention rates between the two report years.

Figure 7. Longitudinal Comparison for One-year Retention Rates of the Percentage of Teachers Retained Across School Poverty Categories, by Organizational Level



Note. *Omnibus test is significant at the .05 level for 2018-2019. ^Omnibus test is significant at the .05 level for 2020-2021. See the Appendix for pairwise comparisons for 2020-2021.

Figure 8. Longitudinal Comparison for Three-year Retention Rates of the Percentage of Teachers Retained Across School Poverty Categories, by Organizational Level



Note. *Omnibus test is significant at the .05 level for 2018-2019. ^Omnibus test is significant at the .05 level for 2020-2021. See the Appendix for pairwise comparisons for 2020-2021.

Despite the different manner in which school poverty was categorized in the two SC-TEACHER reports, similarities in South Carolina's teacher retention were observed across time. Schools with higher levels of student poverty were consistently associated with significantly lower teacher retention rates. Interestingly, the longitudinal comparison of one-year retention rates (Figure 7) showed slightly higher teacher retention levels in 2020-2021 as compared to rates in 2018-2019 across all poverty levels. One hypothesis is that slightly higher retention could be related to additional funding related to COVID pandemic pay provided by some districts; however, this is speculative. The longitudinal comparison of three-year retention rates (Figure 8) is consistent across both school years, showing greater stability of teacher retention rates over the longer time period.

Relationship Between South Carolina Teacher Retention Rate Findings and Published Studies, by School Poverty Level

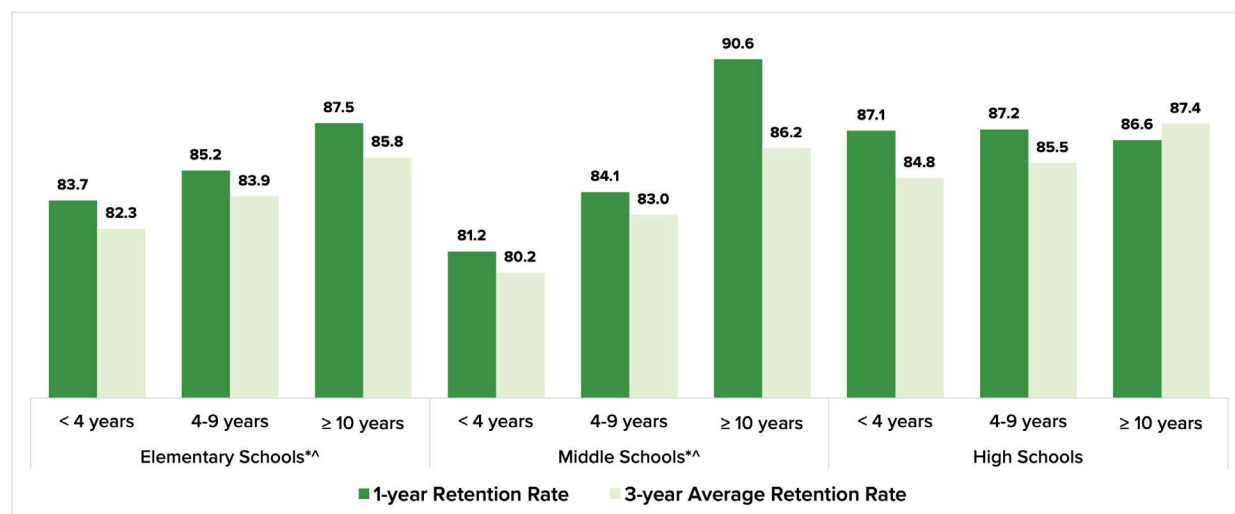
Findings observed with South Carolina teacher retention rates are consistent with findings from other studies. Hughes (2012) found that socioeconomic status (SES) significantly contributed to teacher retention. Carver-Thomas and Darling-Hammond (2019) identified high turnover rates in schools serving students from low-income families, and Smith and Ingersoll (2004) concluded that teachers were more likely to leave schools with high-poverty populations.

+ KEY QUESTION 3B:

Among organizational levels, how do South Carolina teacher retention rates differ in relation to principal tenure?

One-way ANOVAs were used to examine average teacher retention by the number of years of the principal's tenure at a school. The number of years that a principal could have been in the leadership role was continuous, ranging from one-half a school year (0.5 years) to 39 years. To create categories for comparison, the length of principal tenure in South Carolina was cut into three categories: less than four years, four to nine years, and 10 years or more. Figure 9 provides a graphical summary of average teacher retention rates by tenure category, within each school organizational level.

Figure 9. Percentage of Teachers Retained Across Principal Tenure Categories, by Organizational Level



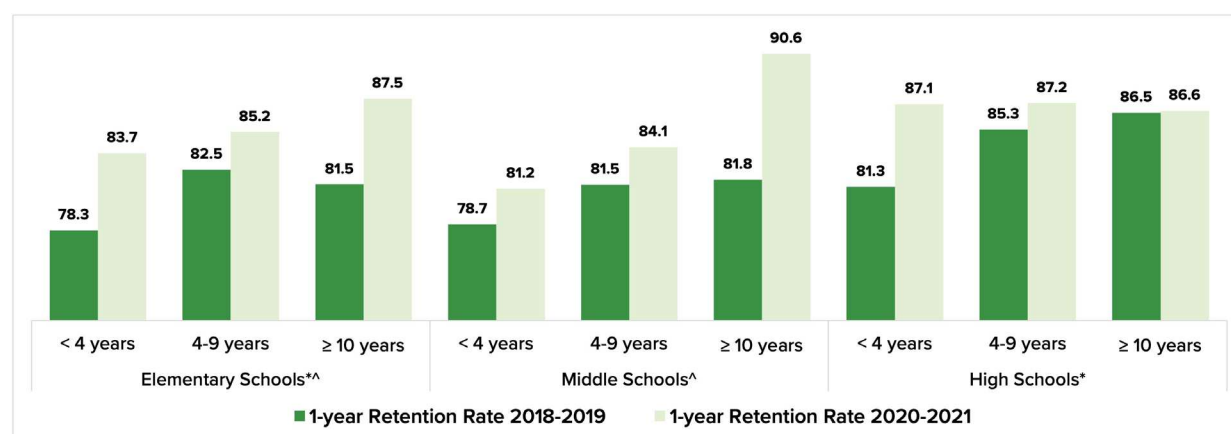
Note. *Omnibus test is significant at the .05 level for the one-year retention rate. ^Omnibus test is significant at the .05 level for the three-year average retention rate. See the Appendix for pairwise comparisons.

At elementary and middle schools, teacher retention rates in South Carolina were higher at schools with principals having more years of experience. Average teacher retention rates were generally similar across one year and three years, though there was a 4% difference in the one-year and three-year rates at middle schools with principals tenured for 10 or more years. While elementary and middle schools led by principals with less experience yielded lower teacher retention rates than schools with more experienced principals, this pattern did not extend to high schools, where both the one-year and three-year retention rates did not appear to vary with principal tenure.

Retention Rate Comparison Across Time: Principal Tenure

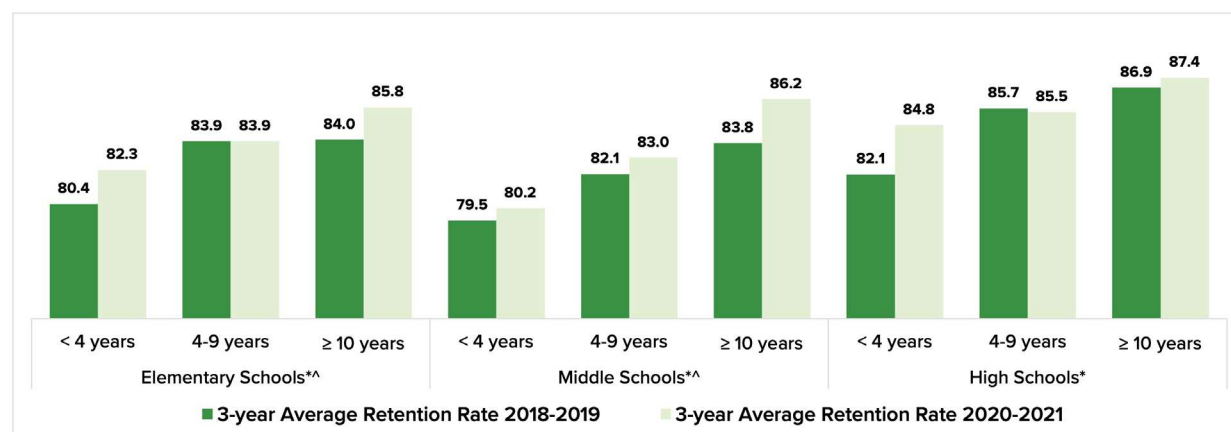
To examine differences over time, teacher retention rates were examined with the previous SC-TEACHER rates. Similar groupings were used to categorize principal tenure in the prior report, allowing for direct comparison. The longitudinal comparisons are provided in Figures 10 and 11.

Figure 10. Longitudinal Comparison for One-year Retention Rates of the Percentage of Teachers Retained, by Organizational Level Across Principal Tenure



Note. *Omnibus test is significant at the .05 level for 2018-2019. ^Omnibus test is significant at the .05 level for 2020-2021. See the Appendix for pairwise comparisons for 2020-2021.

Figure 11. Longitudinal Comparison for Three-year Retention Rates of the Percentage of Teachers Retained, by Organizational Level Across Principal Tenure



Note. *Omnibus test is significant at the .05 level for 2018-2019. ^Omnibus test is significant at the .05 level for 2020-2021. See the Appendix for pairwise comparisons for 2020-2021.

The three-year teacher retention rates in each report were much more similar than the comparison of the one-year retention rates between reports. The high school one-year retention rates were similar with more experienced principals (4 or more years), but the remaining one-year rate comparisons differed by 3-9%. Comparing the more stable three-year retention rates also illustrates the general trend that teacher retention is positively related to the principal tenure.

Relationship Between South Carolina Teacher Retention Rate Findings and Published Studies, by School Factors

Previous research has shown that the relationship between teachers and school administration is important to teacher retention. Carver-Thomas and Darling-Hammond (2019) indicated that a lack of administrative support was associated with teachers’ high turnover rates. Kukla-Acevedo (2009) showed that support from the principal was a protective factor against teacher turnover. In addition, Boyd et al. (2010) found that teachers’ perceptions of the school administration had the greatest impact on their retention decisions.

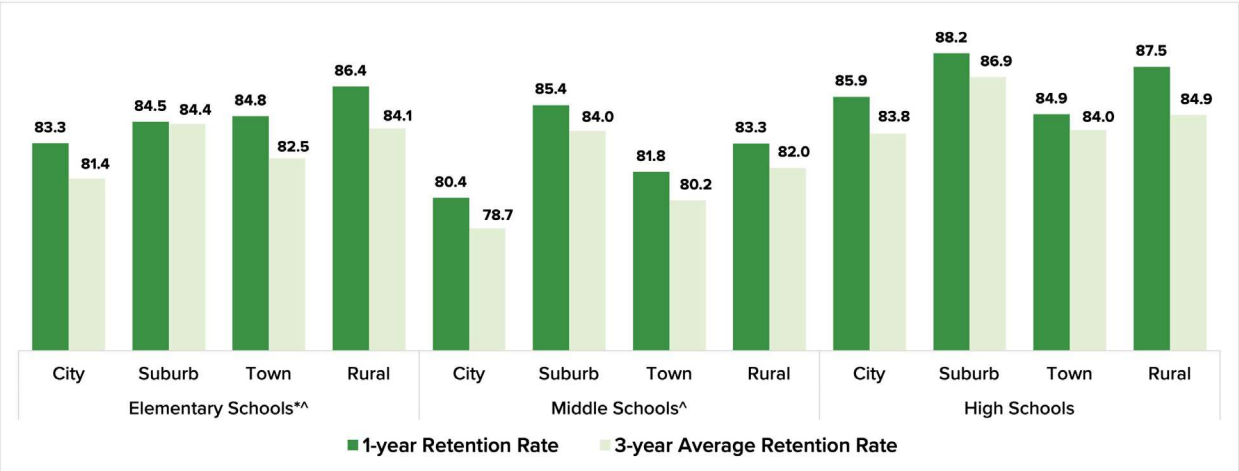
+ KEY QUESTION 3C:
Among organizational levels, do South Carolina teacher retention rates differ depending on the geographic location of the school?

One-way ANOVAs were conducted to examine South Carolina teacher retention rates by the NCES school designation categories (city, suburban, town, or rural setting). A graphical representation of the results is presented in Figure 12.

2020-2021 Teacher Retention Rates by School Location

Average teacher retention rates were examined among school locales, within each school organizational level. For elementary and middle schools, schools based in cities yielded the lowest average teacher retention rates, and suburban schools yielded high average teacher retention rates across all three organizational levels. Middle schools, particularly those based in cities and towns, had lower retention rates.

Figure 12. *Percentage of Teachers Retained Across School Location Categories, by Organizational Level*



Note. *Omnibus test is significant at the .05 level for one-year retention rate. ^Omnibus test is significant at the .05 level for three-year average retention rate. See the Appendix for pairwise comparisons.

In every instance, the three-year teacher retention rates were lower than the one-year retention rates. With the one-year retention rate, the differences displayed were only statistically significant within elementary schools, where city-based elementary schools possessed the lowest retention rates.

Differences in teacher retention rates were more prominent with three-year retention rates. For elementary schools in South Carolina, small differences in retention rates were observed, with city schools exhibiting the lowest retention rates. Larger differences were found in middle school locations, with city-based schools demonstrating the lowest teacher retention rates. No statistical differences were found between high school locations, for the one- or three-year retention rates. Overall, school location did not explain much of the differences in teacher retention rates in this analysis.

Retention Rate Comparison Across Time: School Location

The 2018-2019 SC-TEACHER retention study used only two categories for school location, rural and urban schools. Here, four categories were used, according to the NCES definition of locale. Because of these differences in how schools were categorized into locales, we cannot make direct comparisons but rather offer some general observations. Across time, middle schools continued to possess the lowest retention rates and urban/city locales reported lower retention rates than other locales in the state.

However, the previous report did not find significant differences among teacher retention rates when comparing rural and urban schools. Use of a more granular approach to categorizing school locations did uncover some differences in South Carolina teacher retention rates due to locale. Instances where city and suburban schools were combined into an urban category in the past likely masked significant differences in retention rates.

Relationship Between South Carolina Teacher Retention Rate Findings and Published Studies, by School Location

Findings observed with South Carolina teachers support previous research showing higher retention in suburban schools. Lankford et al. (2002) found that teachers were more likely to leave urban schools, a finding echoed in the Tennessee Department of Education's report on teacher retention (Collins & Schaaf, 2020), which found that urban schools have the lowest retention rates when measured at the state, district, or school level. Miller's (2012) study in New York showed that experienced teachers transfer away from rural schools to suburban schools, resulting in lower retention rates in rural schools. However, while pointing out the difficulties in performing large-scale studies on teacher retention, Papay et al. (2017) found little evidence that urban schools were losing teachers to suburban schools, stating that more often urban schools were losing teachers to other similar schools within the same district. This discrepancy points to differences in how school location is assessed and the need to track teacher trajectories at the teacher level instead of the school level. Along these lines, defining rural is more complicated than simply "not urban." Rural schools closer to urbanized areas are often in suburban districts and benefit from greater resources, like higher salaries (Miller, 2012). These rural schools may look quite different from more remote rural schools, which may have fewer resources. Analyses that place both types of rural schools in a generic "rural" category may fail to detect important differences.

+ RECOMMENDATIONS TO ADDRESS TEACHER RETENTION

Based on the analyses of South Carolina teachers, we provide the following suggestions that could contribute to the development of school-level teacher retention programs and educational policymaking:

1. Promote efforts to enhance the school work environment to increase teacher satisfaction and promote a positive school climate, especially at middle schools.

Relationships with school report card variables showed that school climate characteristics and teacher salary yielded significant relationships with teacher retention rates. Middle school retention rates were lower than at other organizational levels. Efforts in these areas may also help to create a supportive administrative environment through district-led mechanisms to support and retain principals, such as through developing shared leadership models with middle school faculty (Podolsky et al., 2019). Relatedly, Santoro (2018) argued that teachers often find themselves “demoralized” in the profession and that supporting professional communities can help teachers maintain their passion and sense of purpose. Thus, we consider it important for schools to encourage collaboration and a sense of shared professional practice and that this community should be built in such a way that involves and engages families and the local community (Hughes, 2012).

2. Provide mechanisms for additional funding.

Salary was noted by South Carolina teachers and many prior research studies as an important factor for improving teacher retention, and this issue may also be highlighted as it is important to retaining teachers. Relatedly, the impact of the recent state-wide increase in starting teacher pay should be studied because teachers with higher beginning salaries have been found to be associated with a greater likelihood of staying (Gray & Taie, 2015; Hughes, 2012).

However, going beyond teacher salary, results suggested that higher levels of funding at a school (noted through higher school enrollment) can lead to better retention as these schools often have greater access to more current technology and better materials. For schools that have high per-pupil expenditures, if monies could be spent to enhance instructional materials, provide increased professional development opportunities, and enhance the physical environment, retention rates may be improved. Additionally, this report focused solely on teacher retention as defined by teachers remaining within the same school across years. Thus, this report does not capture data for teachers remaining in the profession but moving from one school to another within South Carolina. Research studies are needed to better identify successful recruitment and retention factors, and to identify differences among teachers who stay in the same school, remain in the profession but move from one school to another in the state, or leave the profession altogether. These studies can assist with a more complete understanding of teacher retention and help to support data-driven policy aimed at recruiting and retaining teachers. In addition, South Carolina also has current teacher retention programs (e.g., CarolinaTIP and Alternative Pathways to Educator Certification [APEC]) with strong track records of success that could be leveraged to bolster recruitment and retention efforts at the state and district level.

3. Consider school characteristics (e.g., poverty level, grade levels served, school local), which could be considered in policymaking regarding funding allocation, interventions, and programs at the schools.

Overall and within more granular analyses, middle schools consistently exhibited the lowest retention rates. Poverty is also significantly related to lower teacher retention rates. This suggests that different types of preparation and/or support might be needed for different types of schools. For instance, high-poverty middle schools or city-based middle schools may need particular attention and support for their retention efforts.

+ FUTURE INVESTIGATIONS

There are some limitations to this study. One major limitation was that we examined only school-level variables associated with teacher retention. Teachers' decisions to stay, move, or leave their profession are influenced by many factors, such as personal and professional characteristics of the teachers, in addition to school attributes (Borman & Dowling, 2008). To gain a greater understanding of factors contributing to teacher retention, future studies may include surveys of open-ended questions or other methods (e.g., focus groups, case studies or interviews) to hear reasons South Carolina teachers are leaving, staying, and moving schools. Acknowledging teachers' specific reasons for staying or leaving would help develop strategies that help schools effectively retain teachers. At the end of the 2021-2022 school year, an exit survey was given to teachers leaving their current positions. Linking future retention reports to a data source like that could provide more insight into the career choices teachers make.

In addition, future studies should consider both teacher and student variables in addition to school-level variables, as well as attempt to track individual teachers' movements over time. The retention rates utilized here are helpful when looking at staffing trends at the school level, but they do not tell us as much about trajectories within the teacher workforce. When a school's retention rate decreases, teachers may leave the profession entirely or simply move to another school. Tracking individual teachers' movements within the profession will provide a more nuanced understanding of the overall teacher workforce. Along these lines, the Institute of Education Sciences recommends using three-year retention rates at a minimum to explore trends due to the volatility in one-year rates (Hanita et al., 2021). For example, many of the one-year retention rates in this current study for the 2020-2021 school year are higher than the three-year retention rates despite the challenges of the COVID pandemic. Clearly, those special circumstances require focused study when the teacher retention rates after 2020-2021 are investigated.

Additionally, an upcoming survey addressing teacher perceptions of their working conditions may prove to be an invaluable source of insight as to the specific demands and resources that are impacting teachers' job satisfaction and levels of burnout.

In conclusion, the findings of this study provide a holistic picture of teacher retention in South Carolina and help to identify school-level factors associated with teachers' decisions to stay at a school. It is important to consider that teachers' decisions to remain in the field or to leave the teaching profession are more complex than any single factor. As Borman and Dowling (2008) noted, teachers' decisions to stay, move, or leave their profession are influenced by many factors, including teachers' personal and professional characteristics. In addition, previous literature has found that teachers with more extensive pre-professional experiences or mentoring were less likely to leave their profession (Darling-Hammond, 2003; Goldhaber et al., 2022; Gray & Taie, 2015; Smith & Ingersoll, 2004) and that well-operated induction and mentoring programs were the best methods for increasing teacher retention (Brill & McCartney, 2008). We suggest that school-, teacher-, and even student-level variables be modeled collectively and analyzed as an interrelated system rather than focusing on one perspective or level at a time. Lastly, tracking teacher movement on an individual level will provide greater context when distinguishing retention rates from attrition rates in the consideration of effectively staffing the schools of South Carolina. We hope the findings can inform policymaking in K-12 education, funding designation for schools, and developing strategies for school improvement and teacher retention.

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+ APPENDIX: DETAILED TECHNICAL ANALYSIS RESULTS

This appendix details the research study and data analysis using a statistical lens. All relevant hypothesis tests, tests of assumptions, and measures of results are described.

Data Sources

This study used school report card data from the 2020-2021 school year; all data sources are publicly available from the South Carolina Department of Education (<https://ed.sc.gov/data/report-cards/>). Schools (n = 104) with unreported teacher retention rates data were excluded from this study. The analyses included 1,178 public schools in South Carolina. School report cards for South Carolina are summarized for five school types: preschools (n = 49, 4.2% of sample), elementary schools (n = 587, 49.8%), middle schools (n = 237, 20.1%), and high schools (n = 206, 17.5%); there are also 99 (8.4% of sample) schools that span more than one organizational level. Schools with combined levels include the following subgroups: 61 (61.6%) schools with both elementary and middle school grades, 21 (21.2%) schools with both middle and high school grades, and 17 (17.2%) K-12 schools.

School Level Factors

This study investigated the associations between teacher retention rates and school-level variables. Teacher retention rates, available in the school report card data, were calculated as the percentage of teachers returning from the previous year at each school. As part of accountability related to the Every Student Succeeds Act (ESSA), a school climate survey is administered annually to teachers in South Carolina public schools. The school report card includes climate survey data showing percentages of teachers who reported satisfaction with the school learning environment, the social and physical environment of the school, and school-home relationships. For these three climate items, teachers report their level of agreement on a four-point scale: Strongly Disagree, Disagree, Agree, and Strongly Agree.

For geographic location, schools were categorized according to census-defined geographic designations (city, suburb, town, or rural) assigned by the National Center for Educational Statistics (NCES) (NCES, 2006). Of the sample of 1,178 schools, one school could not be classified. For the 1,177 South Carolina schools for which school location information could be matched, 200 (17.0%) schools were in cities, 362 (30.8%) schools were in suburbs, 145 (12.3%) were in towns, and 470 (39.9%) were in rural areas.

Concerning student poverty status, the South Carolina Department of Education (SCDE) classifies a child as living in poverty if the student is enrolled in Medicaid, Temporary Assistance for Needy Families (TANF), and/or enrolled in the Supplemental Nutrition Assistance Program (SNAP) or the foster system. Using these markers, the SCDE identified the percentage of pupils-in-poverty (PIP) at the school level. Using the SCDE PIP designation, all schools in South Carolina were then ranked, and quartiles were obtained to create a poverty designation. Teachers at schools in the upper 25% of South Carolina schools in terms of PIP were categorized as teaching in high-poverty schools, and teachers at schools in the lowest quartile of PIP were categorized as teaching in low-poverty schools. Teachers at schools in the middle (25% - 75% of PIP rankings) were categorized as teaching at moderate-poverty schools.

This study also includes the following variables: school enrollment, defined as the total number of students who enrolled in the school (2020-2021); principal tenure, defined as the number of years that a principal had served as a principal at the school; student-teacher ratio in core subjects (i.e., mathematics, English/ Language Arts, science, and social studies); total Per Pupil Expenditure (PPE), defined as the total dollars spent per pupil (across federal, state, and local sources); and teacher salary, defined as the average annual teacher salary at the school.

Principals' tenure at their current school was categorized into three groups: less than four years (n = 528, 46.9%), four to nine years (n = 434, 38.6%), and ten or more years (n = 163, 14.5%) at their current school.

Data Analysis

We employed a quantitative analysis to investigate variables related to the focal outcome variable, teacher retention in South Carolina. First, we used Pearson correlations to explore the overall associations of teacher retention rates with school-level variables, including school climate variables (i.e., teachers' satisfaction with the school learning environment, the social-physical environment, school-home relationships, teachers' views of school safety, student behavior enforcement), teacher salary, school size, school poverty, principal's years at the school, student-teacher ratio, and total per pupil expenditure. Correlation rates can range from a low of zero to a high of 1, with the sign of the coefficient (positive or negative) indicating the direction of the relationship. As the sample size is large, we focused on values of .30 or higher (irrespective of sign), demonstrating an important relationship.

Second, we conducted a descriptive study and an analysis of variance (ANOVA) to examine the differences in teacher retention rates by several variables, including school type (i.e., elementary, middle, high), school poverty, principals' years of leadership, and geographic location. ANOVA is used when examining the difference between multiple categories on a variable of interest, defined here as retention rate. Before conducting ANOVAs, we examined the assumptions required for the analysis, including normality and homogeneity of variances. The homogeneity of variance assumption was checked with Levene's test, and the normality assumption was checked with skewness and kurtosis values. Nonparametric tests were conducted if necessary assumptions were not thought to hold.

Overall differences in teacher retention rates across three school types were initially examined. Then, analyses by school poverty category, principals' years at the school, and geographic location were conducted. As data from the entire state were used in the investigations (i.e., census), effect size measures were calculated in lieu of significance testing to measure the magnitude of the differences in teacher retention rate.

Associations of School-Level Factors and Teacher Retention

The associations between the school-level factors and teacher retention rates are shown in Table 1. For this analysis, schools were categorized by organizational level: preschools, elementary schools, middle schools, high schools, and combined-level schools. Results are provided for the 2020-2021 one-year and three-year average retention rates (from 2018-2019 to 2020-2021).

Table 1. Relationships Between Teacher Retention Rates and School-Level Factors

Factors	All PK-12 Schools 1178		Elementary Schools 587		Middle Schools 237		High Schools 206	
	Retention Rate (1 Year)	Retention Rate (3 Years)	Retention Rate (1 Year)	Retention Rate (3 Years)	Retention Rate (1 Year)	Retention Rate (3 Years)	Retention Rate (1 Year)	Retention Rate (3 Years)
Satisfaction Learning Environ.	0.21***	0.29***	0.18***	0.30***	0.31***	0.41***	0.24***	0.22***
Satisfaction with Social & Physical Environ.	0.19***	0.26***	0.16***	0.25***	0.30***	0.35***	0.26***	0.32***
Satisfaction with Home-School Relationship	0.23***	0.41***	0.21***	0.42***	0.39***	0.51***	0.24***	0.51***
Average Salary	0.21***	0.39***	0.20**	0.48***	0.16*	0.30***	0.28***	0.32***
Student Enrollment	0.10***	0.19***	0.03	0.27***	0.08	0.19**	0.16*	0.24***
Principal Years at School	0.15***	0.18***	0.13**	0.16***	0.26***	0.25***	0.02	0.13
Student Teacher Ratio	0.10***	0.17***	0.06	0.16***	-0.05	0.05	0.23***	0.33***
School Poverty Index	-0.21***	-0.37***	-0.17***	-0.39***	-0.39***	-0.47***	-0.24***	-0.49***
Total Per Pupil Expenditure	-0.04	-0.21**	-0.01	-0.21***	-0.09	-0.28***	-0.20**	-0.35***

***Correlation is significant at the 0.001 level; **Correlation is significant at the 0.01 level; *Correlation is significant at the 0.05 level.

Overall, elementary, middle, and high schools demonstrated significant relationships with most school-level factors. Higher teacher satisfaction with school-home relations, higher teacher salary, and lower school poverty were related to an increased teacher retention rate (i.e., correlation values greater than .30). Overall, the magnitude of the relationships was generally stronger with three-year retention rates than with one-year retention rates, likely due to the random fluctuations represented by the one-year rates.

Three factors (higher school enrollment, higher student-teacher ratio, and lower school poverty) were important to improving preschool teachers' one-year retention rate, but only one factor (teacher satisfaction with home school relations) was significantly associated with preschool teachers' three-year retention rate. For schools with combined levels, only the principal's years at the school were positively related to both one-year and three-year teachers' retention rates. Table 2 provides descriptive results of teacher retention rates for preschools and combined-level schools across varying levels of school poverty, school location, and principal tenure.

Table 2. *Descriptive Information for Preschools and Schools with Combined Levels*

School Type		Retention Rate (1 Year)	Retention Rate (3 Years)
Preschool	<i>All Preschools</i>	85.32	84.23
	School Poverty Level		
	Low (25% or below)	91.85	86.38
	Moderate (25%<P<75%)	87.98	85.15
	High (75% or above)	82.38	83.22
	Principal Years at the School		
	0.5-3.5 Years	84.91	83.98
	4-9 Years	86.38	85.38
	10 or More Years	86.40	87.07
	School Location		
	City	78.12	79.60
	Suburb	89.73	84.80
	Town	84.73	84.96
	Rural	86.17	84.14
Schools with Combined Levels	<i>All Combined Levels Schools</i>	84.11	82.17
	School Poverty		
	Low (25% or below)	83.87	81.62
	Moderate (25%<P<75%)	83.53	83.05
	High (75% or above)	85.63	81.51
	Principal Years at the School		
	0.5-3.5 Years	81.35	80.30
	4-9 Years	84.66	81.09
	10 or More Years	89.04	85.93
	School Location		
	City	85.67	81.21
	Suburb	80.23	78.95
	Town	87.94	83.23
	Rural	84.17	84.28

Teacher Retention by School Type

Before running the ANOVAs, we examined appropriate assumptions. The normality assumptions were met for both analyses: skewness values < |2| and kurtosis values < |7|. The homogeneity of variance assumption was met only for the three-year average teacher retention rates across school types, which allowed for the use of Tukey's honestly significant difference test (HSD) for pairwise differences between the school types. For the one-year retention rate across organizational levels, we conducted a Welch one-way ANOVA and then used Games-Howell post hoc tests for pairwise comparisons. Both Tukey's HSD and Games-Howell adjust *p*-values to control for Type I errors.

To understand similarities and differences in teacher retention for elementary, middle, and high schools, the average teacher retention rates by school organizational level were calculated as shown in Table 3. An omnibus ANOVA test of variance was conducted for each of the one-year and three-year retention rates to determine if these mean rates differed significantly between organizational levels. Partial η^2 was calculated to measure the magnitude of the overall differences in rates due to organizational level for both the one- and three-year retention rates. Cohen (1988) defined effect sizes as small ($\eta^2 = .01$), medium effect ($\eta^2 = .06$), and large ($\eta^2 = .14$).

Table 3. Teacher Retention Rate by School Type (%)

School Type	Retention Rate (1 Year)			Retention Rate (3 Years)		
	N	Mean	p-value effect size	N	Mean	p-value effect size
Elementary Schools	587	85.08 ^b	$p < .001^{***}$ $\eta^2 = .021$	561	83.57 ^{a,b}	$p < .001^{***}$ $\eta^2 = .020$
Middle Schools	237	83.29 ^c		228	81.85 ^{a,c}	
High Schools	206	87.25 ^{b,c}		193	85.24 ^{b,c}	

*** Result is significant at the 0.001 level; **Result is significant at the 0.01 level; *Result is significant at the 0.05 level. ^asignificant results between elementary and middle schools; ^bsignificant results between elementary and high schools; ^csignificant results between middle and high schools

Both omnibus tests were significant ($<.001$), indicating there was a difference in retention rates between school organizational level for the one-year rates and the three-year rates. However, the magnitude of these differences was small, indicating that organizational level accounts for a small portion of the variance in retention rates. Pairwise comparisons between organizational levels revealed that high school retention rates were significantly higher than elementary school retention rates (one-year retention rate: $p = .004$, $d = .23$; three-year retention rate: $p = .017$, $d = .23$), and high school retention rates were significantly higher than middle school retention rates (one-year retention rate: $p < .001$, $d = .44$; three-year retention rate: $p < .001$, $d = .49$).

Teacher Retention by School Poverty

To gain a greater understanding of how poverty at the school level is associated with teacher retention rates, the average teacher retention rates were calculated for three categories of school poverty: schools in the highest quartile of school PIP (high poverty), schools in the middle 50% of school PIP (moderate poverty), and schools in the lowest quartile of school PIP (low poverty). Retention rates by poverty level were further categorized by school organizational level to see if the association between poverty rates and retention rates differed by the grade levels the school served. Table 4 provides the teacher retention rates by organizational level and school poverty level.

Before running the ANOVAs, we examined the necessary assumptions. For all the analyses, the assumption of normality was met. The homogeneity of variance assumption was met to analyze the one-year teacher retention rates across school poverty levels in middle and high schools and the three-year average teacher retention rates across school poverty levels in middle school. When homogeneity of variance was satisfied, we used Tukey's honestly significant difference test (HSD) for pairwise differences. For the analyses which did not meet the equal variance assumption, we conducted Welch one-way ANOVA tests and utilized Games-Howell post hoc tests for pairwise comparison.

An omnibus ANOVA test of variance was conducted for one-year and three-year retention rates to determine if the mean rates associated with school poverty differed significantly between school organizational levels. Partial η^2 was calculated to measure the magnitude of the overall differences in rates due to school poverty level for both the one and three-year retention rates.

Table 4. Teacher Retention Rate by School Poverty (%)

School Type	School Poverty	Retention Rate (1 Year)	p-value effect size	Retention Rate (3 Years)	p-value effect size
Elementary Schools	Low	86.43 ^b	$p < .001^{***}$ $\eta^2 = .049$	86.89 ^{a,b}	$p < .001^{***}$ $\eta^2 = .160$
	Moderate	86.78 ^c		85.17 ^{a,c}	
	High	81.33 ^{b,c}		78.35 ^{b,c}	
Middle Schools	Low	87.56 ^{a,b}	$p < .001^{***}$ $\eta^2 = .100$	85.58 ^{a,b}	$p < .001^{***}$ $\eta^2 = .210$
	Moderate	83.13 ^{a,c}		82.36 ^{a,c}	
	High	78.26 ^{b,c}		75.23 ^{b,c}	
High Schools	Low	89.48 ^{a,b}	$p < .001^{***}$ $\eta^2 = .070$	88.19 ^{a,b}	$p < .001^{***}$ $\eta^2 = .174$
	Moderate	86.37 ^a		84.45 ^{a,c}	
	High	83.42 ^b		79.17 ^{b,c}	

*** Result is significant at the 0.001 level; **Result is significant at the 0.01 level; *Result is significant at the 0.05 level. ^asignificant results between Low and Moderate; ^bsignificant results between Low and High; ^csignificant results between Moderate and High

For elementary schools, the one-year and three-year retention rates at high-poverty schools were significantly lower than those in low-poverty (one-year retention rate: $p < .001$, $d = .51$; three-year retention rate: $p < .001$, $d = 1.18$) and moderate-poverty schools (one-year retention rate: $p = .004$, $d = .54$; three-year retention rate: $p = .017$, $d = .97$). For middle schools, all three pairwise comparisons were statistically significant for one-year and three-year average retention rates. High-poverty schools showed the lowest retention rates compared to low-poverty schools (one-year retention rate: $p < .001$, $d = 1.09$; three-year retention rate: $p < .001$, $d = 1.63$) and moderate-poverty schools (one-year retention rate: $p = .009$, $d = .49$; three-year retention rate: $p < .001$, $d = 1.00$). For high schools, all three pairwise comparisons were statistically significant for the three-year retention rate, with high-poverty schools having the lowest retention compared to low-poverty schools ($p < .001$, $d = 1.74$) and moderate-poverty schools (three-year retention rate: $p = .005$, $d = .84$). For the one-year retention rate, low-poverty schools had a significantly higher retention rate than moderate-poverty ($p = .014$, $d = .43$) and high-poverty high schools ($p = .001$, $d = .95$).

These patterns were consistent for both the one-year average and the three-year average retention rates. The school poverty level accounted for a medium amount of variability in the one-year average retention rate and explained a large amount of variability in the three-year retention rate. High-poverty middle schools displayed the lowest one- and three-year teacher retention rates in all the analyses conducted for this study. Overall, the poverty level of the school is an important factor in teacher retention, with lower-poverty schools suffering lower retention levels across all organizational types.

Teacher Retention by Principals' Years at the School

The relationship between the length of tenure of a school's principal and teacher retention rates was also examined. The average teacher retention rates were calculated for three categories of principal tenure: principals with less than 4 years served at their current school, principals with 4-9 years in that position at their current schools, and principals who had served in that role for 10 or more years at their current school. These retention rates by poverty level were further categorized by school organizational level to see if the association between principal tenure and retention rates differed by the grade levels the school served. Table 5 provides the teacher retention rates by organizational level and principal tenure.

Before running the ANOVAs, we examined the necessary assumptions. For all the analyses, the assumption of normality was met. The homogeneity of variance assumption only was met to analyze the one-year teacher retention rates across principals' years at the school in high schools; however, the homogeneity of variance assumption was met for all organizational levels for the three-year average teacher retention rates. When homogeneity of variance was satisfied, we used Tukey's honestly significant difference test (HSD) for pairwise differences. For the analyses which did not meet the equal variance assumption, we conducted Welch one-way ANOVA tests and utilized Games-Howell post hoc tests for pairwise comparison.

An omnibus ANOVA test was conducted for one-year and three-year retention rates to determine if the mean rates associated with principals' years at the school differed significantly between school organizational levels. Partial η^2 was calculated to measure the magnitude of the overall differences in rates due to principals' years at the school for both the one- and three-year retention rates.

Table 5. *Teacher Retention Rate by Principals' Years at the School (%)*

School Type	Principal Years at the School	Retention Rate (1 Year)	p-value effect size	Retention Rate (3 Years)	p-value effect size
Elementary Schools	Less than 4 Years	83.69 ^b	$p = .004^{**}$ $\eta^2 = .016$	82.30 ^b	$p < .001^{***}$ $\eta^2 = .030$
	4-9 Years	85.16		83.89	
	10 or More Years	87.47 ^b		85.79 ^b	
Middle Schools	Less than 4 Years	81.19 ^b	$p < .001^{***}$ $\eta^2 = .115$	80.15 ^{a,b}	$p < .001^{***}$ $\eta^2 = .070$
	4-9 Years	84.10 ^c		82.98 ^a	
	10 or More Years	90.60 ^{b,c}		86.24 ^b	
High Schools	Less than 4 Years	87.11	$p = .970$ $\eta^2 < .001$	84.79	$p = .360$ $\eta^2 = .010$
	4-9 Years	87.17		85.52	
	10 or More Years	86.64		87.44	

***Result is significant at the 0.001 level; **Result is significant at the 0.01 level; *Result is significant at the 0.05 level. ^asignificant results between 0.5-3.5 Years and 4-9 Years; ^bsignificant results between 0.5-3.5 Years and 10 or More Years; ^csignificant results between 4-9 Years and 10 or More Years

Overall, the length of principal tenure was positively associated with higher teacher retention rates, though the patterns were not consistent across school organizational levels. Elementary and middle schools showed a significant association ($p < .001$) between principal tenure and teacher retention rates for both the one- and three-year rates. However, principal tenure only accounted for a small amount of the variance in teacher retention rates in elementary schools, and the only significant pairwise difference was between the longest and shortest tenure categories (one-year retention rate: $p = .002$, $d = .36$; three-year retention rate: $p < .001$, $d = .47$). In middle schools, principal tenure accounted for a medium amount of the variance in teacher retention rates for both the one- and three-year rates. Retention rates were higher for the longest tenure (10 or more years) compared to schools with principal tenure between four to nine years (one-year retention rate: $p < .001$, $d = .93$; three-year retention rate: $p = .002$, $d = .78$) and schools with principal tenure of fewer than four years (one-year retention rate: $p < .001$, $d = .29$; three-year retention rate: $p = .021$, $d = .38$). However, no statistical differences associated with principal tenure were observed among retention rates for high school teachers. The findings suggest that principal tenure can be an important contributor to teacher retention at elementary and middle levels but is possibly less important for high school teachers. In general, the number of years that a principal held their position was, at most, a small contributor to explaining the retention rate.

Teacher Retention by School Location

To investigate teacher retention rates for schools in different locations, we calculated the mean teacher retention rates by the school's census-defined geographic designation: city, suburb, town, or rural. These retention rates by location were further categorized by school organizational level to see if the association between school location and retention rates differed by the grade levels the school served. Table 6 provides the teacher retention rates by organizational level and school location.

Before running the ANOVAs, we examined the necessary assumptions. For all the analyses, the assumption of normality was met. The homogeneity of variance assumption was met for all organizational levels to analyze the one-year teacher retention rates across school locations; however, for the three-year retention rates, the variance assumption was only met for middle schools. When homogeneity of variance was satisfied, we used Tukey's honestly significant difference test (HSD) for pairwise differences. For the analyses which did not meet the equal variance assumption, we conducted Welch one-way ANOVA tests and utilized Games-Howell post hoc tests for pairwise comparison.

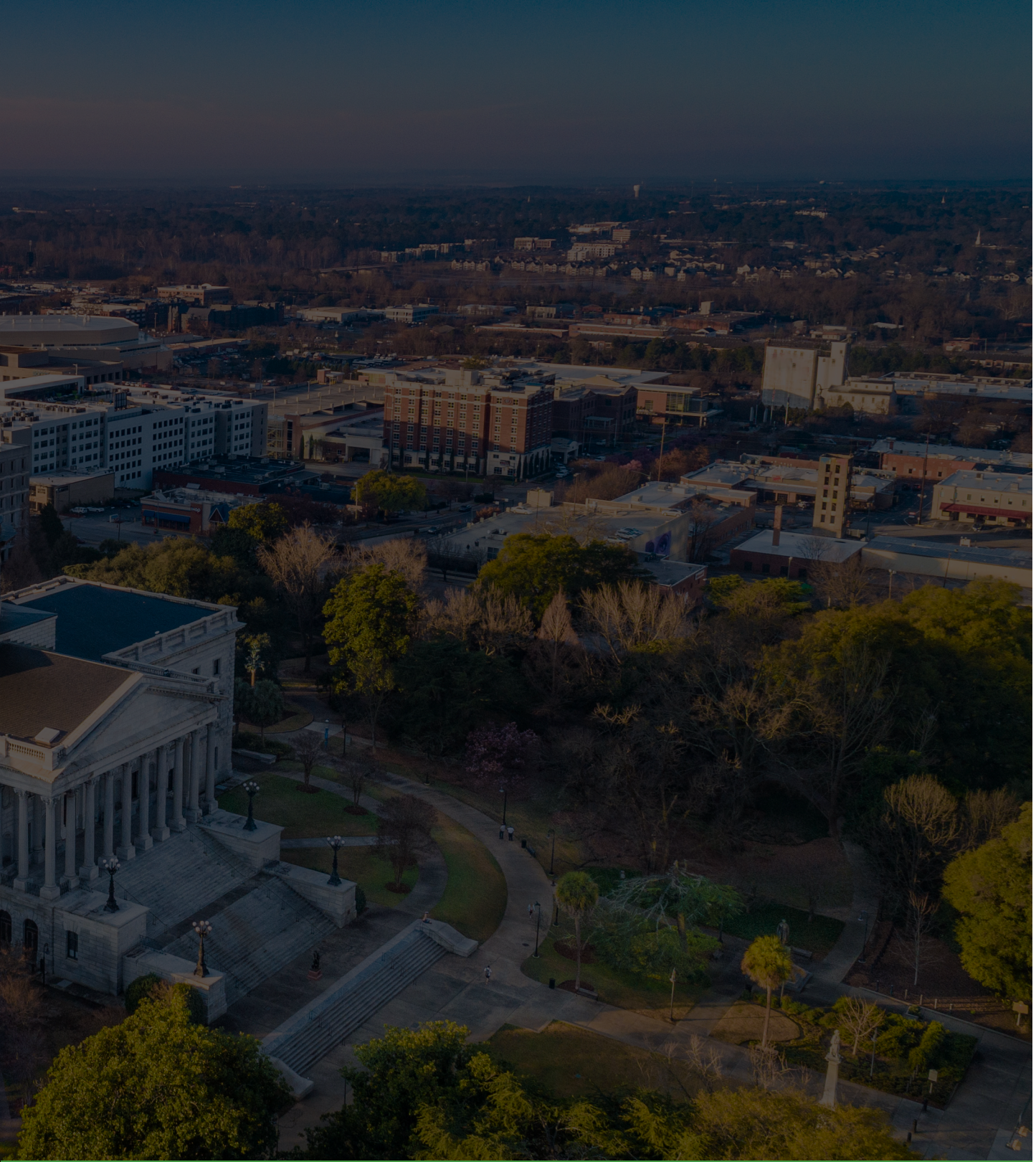
An omnibus ANOVA test of variance was conducted for one-year and three-year retention rates to determine if the mean rates associated with school location differed significantly between school organizational levels. Partial η^2 was calculated to measure the magnitude of the overall differences in rates due to school location for both the one- and three-year retention rates.

Table 6. Teacher Retention Rates by School Location (%)

School Type	School Location	Retention Rate (1 Year)	<i>p</i> -value effect size	Retention Rate (3 Years)	<i>p</i> -value effect size
Elementary Schools	City	83.32 ^b	<i>p</i> = .046* η^2 = .010	81.40 ^{a,b}	<i>p</i> = .005** η^2 = .020
	Suburb	84.50		84.37 ^a	
	Town	84.80		82.51	
	Rural	86.43 ^b		84.12 ^b	
Middle Schools	City	80.35	<i>p</i> = .060 η^2 = .030	78.69 ^a	<i>p</i> = .003** η^2 = .060
	Suburb	85.41		83.98 ^a	
	Town	81.76		80.20	
	Rural	83.31		81.98	
High Schools	City	85.86	<i>p</i> = .210 η^2 = .020	83.84	<i>p</i> = .081 η^2 = .040
	Suburb	88.23		86.94	
	Town	84.90		84.04	
	Rural	87.50		84.86	

*** Result is significant at the 0.001 level; **Result is significant at the 0.01 level; *Result is significant at the 0.05 level. ^asignificant results between City and Suburb; ^bsignificant results between City and Rural

Overall, teacher retention rates were similar when comparing schools in different geographic locations within elementary, middle, and high school levels. For the one-year teacher retention rates, no differences were observed among city, suburb, town, or rural locales for middle and high schools. Only a small overall difference was found between city and rural (*p* = .046, *d* = .29) locations in elementary schools. There were more significant differences noted in three-year teacher retention averages at elementary and middle schools. For middle schools, retention rates of teachers in South Carolina cities were significantly lower than the retention rates of schools in suburbs (*p* = .002, *d* = .85); these differences were associated with a medium size effect of location on teacher retention. For elementary schools, there were significant pairwise differences indicating that cities have significantly lower retention rates than suburban (*p* = .008, *d* = .44) and rural (*p* = .033, *d* = .33) areas, but the effect size related to the elementary school three-year retention rates was small. High schools showed no significant differences in teacher retention rates based on school location. Overall, school location did not explain much of the differences in teacher retention rates in this analysis.



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