The Effect of Florida School District Classifications on Academic Outcomes: A Multivariate Analysis

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Abstract

This study takes a macro-scale look at the state of Florida, utilizing aggregated data from all 67 of its school districts from academic years 2015–2016 and 2016–2017, as a first step to understanding statewide patterns. It details statistical analyses that intend to describe (rather than generalize) trends in student performance on standardized tests by district, testing for an effect of location on performance when accounting for additional student variables. Findings can provide a framework around which to inform policy changes and pedagogical techniques in order to improve the quality of education across the state.

Keywords*:* school district, city, rural, suburban, town, K-12, academic outcomes, testing

Introduction

School districts are key entities for educational policymakers and funding agencies to address educational reform and success, as they are windows to examine and promote regional educational equality and academic achievement (Chingos, Whitehurst, & Gallaher, 2015). Limited research, however, has looked at districts as discrete units of analysis. As pointed out by Chingos et al. (2015), one major flaw of the few studies that have done so (e.g., Waters & Marzano, 2007) is that they do not take into consideration the individual characteristics of school districts that could affect achievement. Chingos et al. (2015) also stressed the need for researchers to control variables known to affect achievement to make analysis more meaningful. Another crucial aspect of district achievement that also has not been adequately addressed is the over-time effect. Understanding the trends of how districts perform over time can stimulate deeper discussions about the reasons that student achievement across different districts has improved or deteriorated, thereby providing meaningful data for district-level policymaking.

Before problems related to academic equity can be solved on any grand scale in this country, researchers must first understand what is happening in each state, in each of its districts, and in each of its schools. In this particular study, the researchers took a macro-scale look at the state of Florida starting at the district level. Comprised of 67 public school districts, Florida is the fourth largest school system in the U.S. with more than 4,000 public schools (including public charter schools) that enroll almost 3 million students annually (Teach in Florida, 2017). Analyzing district-level student achievements could provide an overall picture of state-level achievements in Florida as well as the district characteristics that affect those achievements. Acknowledging the lack of research that includes control variables or over-time effects in analyzing district achievements, the present study employed multivariate analyses on aggregated data from all 67 of Florida's school districts. In doing so, the researchers intended to not only understand to what extent academic performance varies among school districts across the state of Florida based on district location types, but also how the variability may have changed over time while taking covariates into consideration..

It is important to note that district location is treated as a key variable in the present study. Anyone who has ever worked in public schools in any American state knows that the locale of the school itself plays a large role in the educational experience of both its students and teachers. Being classified as a rural, town, suburban, or city district is implicitly tied with issues of funding, the allocation of resources, and even the ability to hire and retain the best instructors. Such variables certainly affect student performance, and this performance, in turn, often dictates the amount of financial support a school is eligible to receive. More remote areas may offer little of interest to recent graduates eager to begin an exciting life as a teacher in a well-funded school surrounded by things to do, especially when there are more lucrative offers elsewhere. Inner-city violence and poverty are more prevalent in some regions than in others, in many cases making city districts the most fraught with challenges. Previous research has examined other sources of student academic achievement, such as Advanced Placement (AP) programs, and found that a lower percentage of school districts across the nation enroll students in AP classes in rural areas (51.4%) compared with school districts in towns (78.3%), suburban areas (93.8%), and cities (97.3%) (Gagnon & Mattingly, 2016). While matters of equity among school districts differ from state to state, as demographics and distributions of wealth also differ from state to state, such a stark divide indicates a disparity in educational access and instructional quality across geographical regions, making it reasonable to investigate the effect of the school district location on student academic outcomes.

In order to better isolate the effects of geographic location on student academic performance, this study takes into consideration the covariates of *percentage of English language learners* (referred to as ELLs or ELs) as well as the *percentage of students with individual education plans* (IEPs). ELLs are students officially enrolled in the school's English for Speakers of Other Languages (ESOL) program, which requires them to receive some form of catered linguistic instruction and scaffolding in addition to the standard curriculum. In Florida's school system, ELLs are one of the fastest growing populations. ELL percentage might exert a unique influence on district achievements as ELLs may face more linguistic and sociocultural challenges to become high-achieving in the American public-school systems. It is well-established that ELLs underperform nationwide on standardized assessments, largely due to failures in many aspects of teacher training, multicultural sensitivity, and support. Twenty-five percent of ELLs fall short of progress in their English language proficiency (Gollnick & Chinn, 2016), and their graduation rates were about 57% in 2014 in comparison to 79% for their peers (Stetser & Stillwell, as cited by Gollnick & Chinn, 2016). On the other hand, IEP programs are intended to better support the success of students with learning disabilities and special needs; unfortunately, ELLs are disproportionately represented among students with IEPs, even though linguistic needs do not represent a learning disability (Gollnick & Chinn, 2016). Students with both accommodations tend to underperform when compared to their peers, which is why their presence has been controlled for in this study.

In summary, this study is an attempt to yield valuable insights into the trends of Florida school districts' achievements and some factors that may explain these trends. While we must remember that there is variability within each district and exceptions among schools, general patterns are incredibly useful when it comes to identifying large areas of concern. Subsequent studies would ideally delve deeper into school- and student-level concerns with the collection of additional data and even a qualitative look at common practices. The following statistical analyses seek to describe (rather than generalize to a larger population) trends in student performance on standardized tests by district, testing for an effect of location on performance even when accounting for additional variables. Findings can provide a framework around which to inform policy changes and pedagogical techniques in order to improve the quality of education across the state.

Research Questions

Using test score data from the Florida Department of Education (FLDOE) website, school district classifications from the National Center for Education Statistics (NCES), and additional demographic variables computed from NCES data, the research questions are as follows:

1. From 2015–2016, were there mean differences in district-wide academic performance (as measured by a combination of pass rates on the English Language Arts (ELA) Florida State Assessment (FSA), the Math FSA, statewide science exams, and the Biology end-of-course test (EOC) across the Florida school district classifications of city, suburb, town, and rural after accounting for the effects of percentage of English language learners (ELLs) and percentage of students with individualized education plans (IEPs) in each district?
    1a. If so, what were the differences?
2. Between the 2015–2016 and 2016–2017 academic years, were there over-time changes in mean district-wide academic performance (as measured by a combination of pass rates on the ELA FSA, the Math FSA, statewide science exams, and Social Studies EOC achievement across the Florida school district classifications of city, suburb, town, and rural after controlling for the effect of percentage of ELLs?
    2a. If so, what were the differences?

Methodology

Data Sources

As mentioned previously, the data set utilized for this research study was compiled from two sources of information about each of Florida’s 67 school districts for the 2015–2016 and 2016–2017 academic years. This makes *district* the unit of analysis.

Florida academic achievement data. The FLDOE website provided the test scores for the chosen assessments, selected for the variety of skills they represent as well as to paint a more complete picture of assessment on a district level. The ELA FSA results are recorded at the end of the year in aggregated form for grades 3–10; each of the 67 districts reports a percentage score of students across these grades who scored level 3 or above (there are 5 levels in total, but level 3 is satisfactory). The same is true of the Math FSA, though the percentage represents students from grades 3–8. The statewide science exam is given at the end of grade 5, making the pass rate percentage valid only for one grade level (also reported as the percentage of students achieving level 3 or higher). The Social Studies EOC (utilized only in research question #2) represents grades 5–12, and the Biology EOC exam (utilized only in research question #1) represents grades 6–12 (and, again, the percentage of those who achieved level 3 or higher).

Florida district classification. District classifications were taken from the National Center for Education Statistics (NCES) website. In general, district classifications are assigned based on a combination of factors, including population density and location within what the U.S. Census Bureau describes as a Core-Based Statistical Area (CBSA). Districts, in other words, must be situated around an urban area or central cluster of urban areas that contain at least 10,000 people, as well as be socially and economically integrated with this urban core, to be considered as located within a CBSA. CBSAs are then divided into the two categories of *metro*politan (with population cores of at least 50,000 people) and *micro*politan (with population cores of between 10,000 and 50,000 people) (U.S. Census Bureau, 2012).

The National Center for Education Statistics (NCES) has an online glossary of terms related to schools and districts available on their website which defines eight possible school district classifications. Large cities are always at the center of a CBSA and must also have populations of at least 250,000. Midsize cities are either the core or within a cluster at the core of a CBSA but have populations under 250,000. Following city classifications are suburban ones, which consist of urban fringes of large or midsize cities; both are still located within the metropolitan CBSAs of these cities. To reiterate, this means that they are economically and socially integrated with large urban areas. Large towns are defined as having a population of 25,000 or more and being located either *outside* of a *metro*politan CBSA or *within* a *micro*politan CBSA; small towns have populations of between 2,500 and 25,000 and are also either outside of a metropolitan CBSA or within a micropolitan one. Finally, there are the two rural classifications of either *outside* or *inside* a CBSA. Ultimately, defining a district as rural is the prerogative of the U.S. Census Bureau and is based both on low population density and geography, including mountainous, forested, or agricultural areas. More generally, however, "what is not urban is considered rural," and there is no specific definition of what constitutes a rural area (U.S. Department of Health and Human Services, 2017).

In simplest terms, as school districts move away from cities and into rural locations, their distance from economic and political centers grows as their general population decreases; this often means isolation from wealthy, affluent neighborhoods with the most well-equipped institutions. Table 1 defines the eight locale classifications as described by the NCES website. For the purposes of this study, the eight categories were condensed into their four larger groups. The acronym "CBSA" stands for *core-based statistical area*, a region containing a "population nucleus" and surrounding communities that are highly economically and socially integrated (U.S. Census Bureau, 2012, n.p.). There are metropolitan CBSAs, with cores of at least 50,000 people, and micropolitan CBSAs, with cores of at least 10,000 people (U.S. Census Bureau, 2012).

Table 1. *School District Classifications in the United States*

U.S. Census Classification	Population (in number of people)	CBSA Requirement
Large city	≥ 250,000	Core of metropolitan CBSA
Midsize city	< 250,000	At the core of or within a cluster inside metropolitan CBSA
Urban fringe of a large city*	[no population requirement]	Inside metropolitan CBSA
Urban fringe of a midsize city*	[no population requirement]	Inside metropolitan CBSA

Large town	≥ 25,000	Outside metropolitan CBSA or inside micropolitan CBSA
Small town	≥ 2,5000, < 24,999	Outside of metropolitan CBSA or inside micropolitan CBSA
Rural, inside CBSA	**	Inside a CBSA
Rural, outside CBSA	**	Outside a CBSA

Note. *These are considered suburban for the purposes of this study. **There is no specific definition of rural; "what is not urban is considered rural" (U.S. Department of Health and Human Services, 2017, n.p.)

The most recent data available on the NECS website for the state of Florida are from the 2015–2016 school year; thus, we had to ensure that additional variables, including district classifications, were from that year. This presented a challenge, as demographic groups would have been valuable as a second independent variable, but these data were not available on the NCES website for the 2015–2016 school year. Districts do independently report demographic statistics on their individual websites, but their defined categories are often different from one another and therefore incomparable.

Table 2 shows the basic descriptive data in terms of the number of districts within each of the four classifications. It is clear that the groups are unbalanced, and there are very few districts in cities. While this would be a serious limitation in a study that sought to generalize results to a larger population, it is not possible to adjust the sample size when describing the complete population of students in the state of Florida. Furthermore, it must be noted that the data recorded from city districts, though there are few, represent a large number of schools and students (more, in total, than any other district classification), so the values are comparable to each additional category. It is important to note that, in Florida, each county comprises a school district.

Table 2. *Florida's 67 School Districts*

		Value Label	*N* of Districts	Example Districts
City/suburb/town/rural classification	1	rural	20	Wakulla, Levy
	2	town	13	Putnam, Hendry
	3	suburb	29	Miami-Dade, Hillsborough
	4	city	5	Sarasota, St. Lucie

ELL and IEPs as covariates. Both covariates—percentage of ELLs (both research questions) and percentage of students with IEPs (first research question)—were computed using SPSS from the original district variables of *total enrollment*, *total number of ELLs*, and *total number of students with IEPs*. Because the enrollment numbers vary so widely from district to district, raw numerical data would not prove useful for statistical analysis; results would be skewed and unbalanced, dictated entirely by district population rather than by proportion. Percentage of ELLs was computed by dividing the number of ELLs by the total enrollment, and the percentage of students with IEPs was calculated the same way with the corresponding variables.

Statistical Approach

Research Question #1. In order to examine whether there were significant mean differences in students' academic performance across the four assessments of ELA FSA, Math FSA, Biology EOC, and the statewide science exam (composite dependent variables; DVs) between each of Florida's four main district classifications (the independent categorical variable; IV) when taking the two additional continuous covariates of percentage of ELLs and percentage of students with IEPs into consideration, a one-way multivariate analysis of covariance (MANCOVA) was performed on the means of Florida's district classification assessment data using SPSS.

Research Question #2. A two-within, one-between, and one-covariate repeated measures MANCOVA was employed using SPSS for the second research question, with the year serving as the second level of the IVs, to explore the within-subject effects. This over-time analysis allowed the researcher to gauge whether there were significant mean differences in students' academic performance across the four assessments of ELA FSA, Math FSA, the Social Studies EOC, and the statewide science exam (DVs) between each of Florida's four main district classifications (IV) between the 2015–2016 and 2016–2017 school years when taking the continuous covariate of percentage of ELLs into consideration.

Assumptions

Univariate normality tests of the assessments (DVs) showed that ELA and Math FSA scores in both years were normally distributed, whereas the distribution of Science and Social Studies test scores in both years were not normally distributed. Additionally, histograms showed reasonable multivariate normality distributions of the DVs across each of the four district classifications for both research questions. When Kolmogorov-Smirnov tests were utilized to confirm this normality at $p > .05$, the results indicated a violation only among 2015–2016 ELA FSA scores in suburban districts ($p = .016$), 2015–2016 Science EOC scores in rural districts ($p = .026$), 2015–2016 Social Studies EOC scores in rural districts ($p = .003$), and 2016–2017 Social Studies EOC scores in rural districts ($p = .008$). Since MANCOVA is robust to violations of univariate and multivariate normality, the analyses were still conducted. Furthermore, because school districts report their data separately from one another, it can be concluded that the assumption of independence was met. In order to examine the equality of the variance/covariance matrices, Box's test was conducted for the independent variable(s) and the covariate(s) and their interaction across the DVs test scores). The result revealed the assumption was not met for either research question, indicating the null hypothesis of equal variance/covariance matrices should be rejected in both cases. However, Levene's test reveals that the assumption of homoscedasticity was met for three of the five composite DVs (statewide assessments). Because the assumption of homoscedasticity was met for almost all variables, and because this research was conducted on a complete population rather than a small sample, this violation should not interfere with the results of the analyses. Between-subjects effects also show that the assumption of homogeneity of regression slopes was met.

Due to the violation of homogeneity of variance-covariance matrices indicated by the significant result of Box's test, however, the researcher elected to use Wilks' lambda as the most appropriate multivariate test statistic for the first research question. It is robust to such violations and is especially appropriate when studying complete populations. For the second research question, which involves repeated measures, the assumption of sphericity was also examined. According to Mauchly's test of sphericity, this assumption was violated for the within-subject effect of *Test*, x^2 (5) = 28.718, $p < .001$, and the interaction between *Year* and *Test*, x^2 (5) = 47.540, $p < .001$. Because of this, the Greenhouse-Geisser correction was used to interpret within-subject effects. The researcher elected to use Pillai's trace as the multivariate test statistic, which, like Wilks' lambda, is also robust to statistical violations, especially with small sample sizes. It is important to note that correlations among the DVs were higher than .70 (correlations ranged between .787–.982). Tolerance statistics revealed that three achievement scores had tolerance below .5 and six achievement scores had variance inflation factor (VIF) values that exceeded 10. Based on these results, multicollinearity could be an issue. This is not unexpected because even though the assessments were for different subjects, many of the same students take them, and performance across subjects is expected to be consistent.

Results

Research Question #1

The omnibus Wilks' lambda was not statistically significant for the interaction between district classification and the two covariates, $\Lambda = .647$, $F(16, 165.610) = 1.583$, $p = .078$, partial $\eta 2$ = .103, but the effect size (10.3% of the variance can be explained by the independent variable and the covariates) and *p*-value below .078 do indicate that there are group differences just outside the realm of statistical significance. These observable differences can also be seen in the profile plots shown in Figure 1 and will be returned to later with pairwise analysis.

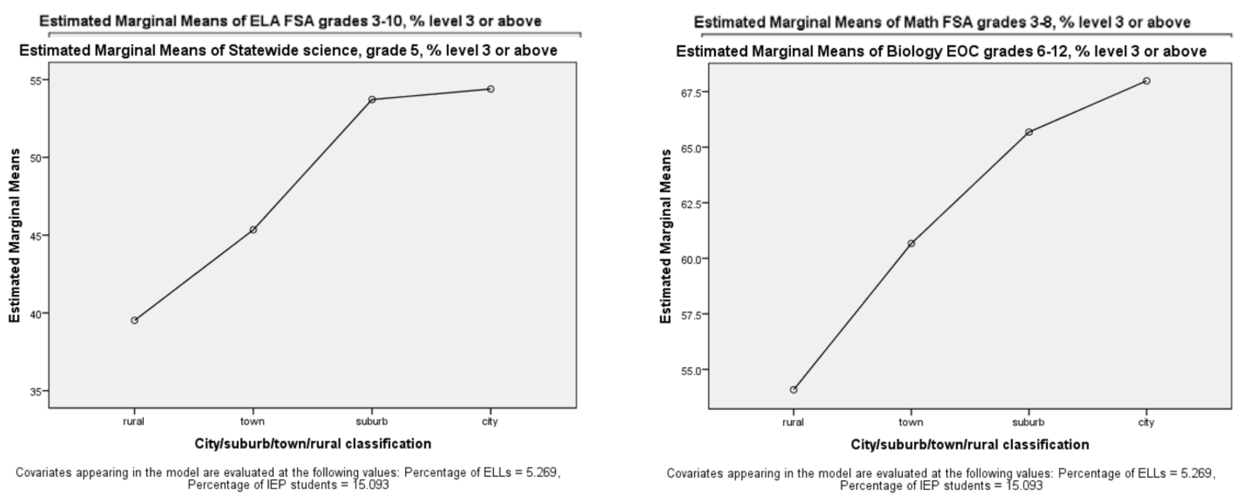

Figure 1. Estimated marginal means of student performance on the ELA and Math FSA by district classification.

The results additionally showed that, without adding the covariates to the model, there was no significant effect of a district's location on academic performance, $\Lambda = .834$, $F(12, 143.62)$ = .847, $p = .602$, partial $\eta 2 = .059$. Despite the fact that, as a whole, differences among all groups for all four assessments were just short of significant for the interaction between district classification and the two covariates (percentage of ELLs and percentage of students with IEPs), there were discrete differences. Group mean differences (unadjusted) were observed after the covariates were added to the model, and these differences were explored deeper with pairwise comparisons. Regarding the ELA FSA, rural districts ($M = 40.802$, $SD = 10.514$, $n = 20$) performed significantly worse than city districts even (and especially) when removing the effect of the covariates (*M* = 55.793, *SD* = 9.441, *n* = 5) and suburban districts (*M* = 53.740, *SD* = 8.175, *n* = 29). Town districts (*M* = 53.186, *SD* = 7.557, *n* = 13) also scored lower overall than city districts and suburban districts. As for the Math FSA, rural districts (*M* = 50.763, *SD* = 11.717) again underperformed when compared to suburban districts (*M* = 60.154, *SD* = 9.106), and town districts (*M* = 53.186, *SD* = 8.423) reported lower scores than suburban districts as well.

It is interesting to note that city districts still had the highest scores on the Math FSA (*M* = 61.205, *SD* = 10.518) but—perhaps because of the low sample size—this result was not quite statistically significantly higher than rural and town districts. On the science statewide exam, rural districts were again the lowest performers (*M* = 39.520, *SD* = 12.254), significantly different from both city (*M* = 54.395, *SD* = 10.999) and suburban (*M* = 45.342, *SD* = 9.521) districts; town districts (*M* = 45.342, *SD* = 8.808) also scored lower than suburban districts. Finally, on the Biology EOC, rural districts had significantly poorer results (*M* = 54.084, *SD* = 15.058) than city districts (*M* = 67.987, *SD* = 13.517) and suburban districts (*M* = 65.682, *SD* = 11.702).

Research Question #2

To answer this research question, the main effect and interaction effects were first examined using Pillai's Trace. The results indicated that after accounting for percentage of ELLs, there were no significant three-way interactions between *Year*, *Test*, and *Location*; Pillai's Trace value = .157, $F(9, 186) = 1.143$, $p = .335$, partial $\eta^2 = .052$, indicating that there were no differences on the combined achievement scores across the years between location groups. Moreover, there was no interaction effect between variables *Year* and *Location*, Pillai's Trace value = .029, $F(3, 62) = .610$, $p = .611$, partial $\eta^2 = .029$, which means that the changes of combined measurement scores over the year did not depend on location. However, *Year* had a significant main effect, Pillai's trace value = .148, $F(1, 62) = 10.736$, $p = .002$, meaning that there was a significant difference in the Florida districts' combined achievement scores between the 2015–2016 school year and the 2016–2017 school year after accounting for the percentage of ELLs. The effect size (partial $\eta^2 = .148$) was large (according to Cohen, 1988), indicating that 14.8% of variance can be explained by the variable *Year*. The results of the test of within-subject effects were found to be similar to the result of the multivariate tests. Because of the small sample size and the violation of the assumption of sphericity, the Greenhouse-Geisser correction was used to interpret the test results. Specifically, after accounting for percentage of ELLs, there were no significant three-way interactions between *Year*, *Test*, and *Location*, $F(6, 124.247) = .893$, $p = .503$, partial $\eta^2 = .041$ or two-way interactions between *Year* and *Location*, $F(3, 124.247) = .610$, $p = .611$, partial $\eta^2 = .029$. The variable *Year* had a significant within-subject main effect, $F(1, 124.247) = 10.736$, $p = .002$, partial $\eta^2 = .148$, again suggesting there was a significant difference in the districts' average achievement scores between the two school years. A pairwise comparison was made between the two levels of *Year*. The 2016–2017 school year had significantly higher average district achievement scores (*M* = 55.818, *SD* = 10.551) than the 2015–2016 school year (*M*= 57.180, *SD* = 10.248).

As for the between-subject effect of *Location*, after controlling for percentage of ELLs, there was a significant difference between rural, town, suburb, and city districts on their average district achievement scores, $F(3, 62) = 7.816$, $p < .001$. The partial η^2 was .274, indicating 27.4% of the variance in the average district achievement scores can be explained by district locations. To further examine how district achievement scores varied depending on *Location*, it was found that the average measured scores of rural (M = 50.460, SD = 8.739, n = 20) and town districts (M = 52.264, SD = 8.354, n = 13) were not significantly different from each other (p = .554). Likewise, the average measured scores of suburb (M = 61.521, SD = 8.681, n = 29) and city (M = 61.751, SD = 8.372, n = 5) districts were not significantly different from each other (p = .956). However, both town and rural districts' achievement scores were significantly lower than the suburb and city districts' achievement scores ($p < .05$).

Discussion and Interpretation

Research Question #1

To summarize, the answer to the first research question—whether, from 2015–2016, there were significant mean differences in district-wide academic performance as measured by a combination of pass rates on the ELA FSA, the Math FSA, statewide science exams, and the Biology EOC across city, suburb, town, and rural districts after accounting for the effects of percentage of English language learners (ELLs) and percentage of students with individualized education plans (IEPs) in each district—was both yes and no. When considering the combined dependent variable of all four assessments analyzed by the original MANCOVA and not accounting for the possible effect of the covariates, it seems there was no significant difference between districts in city, suburban, town, and rural locations when it comes to academic performance. However, the covariates certainly added to the explanatory power of the model. Despite the omnibus Wilks' lambda finding no significant effect overall (across all four assessments) of the interaction between district classification, percentage of ELLs, and percentage of students with IEPs, the effect size (partial $\eta 2$) indicated that 10.3% of the variance was explained by location and the covariates; the p value of .078 was also low enough to warrant a closer inspection of each individual assessment. Pairwise comparisons, an observation of group means, and profile plots showed a clear and significant pattern of underperformance among rural and town districts. This is a worrying finding, and certainly one worthy of additional analysis.

Research Question #2

After accounting for percentage of ELLs, there were no significant three-way interactions between *Year*, *Test*, and *Location*; this indicates that there were no differences on the combined achievement scores across the years between location groups. Moreover, there was no interaction effect between variable *Year* and *Location*; however, *Year* had a significant main effect, meaning that there was a significant difference in the Florida districts' combined achievement scores between the 2015–2016 and 2016–2017 school years after accounting for the percentage of ELLs within each district. This result suggests that a higher percentage of students achieved passing scores in statewide standardized assessments from 2016–2017 than in 2015–2016. Furthermore, district achievement varied depending on location. Similar to what was found with the first research question, town and rural district performance was significantly poorer than suburb and city district performance. In other words, suburb and city districts produced a higher percentage of full-year enrolled students who achieved passing scores in statewide standardized assessments in the past two years than rural and town districts did in the same time period.

In the current dataset, *Achievement Test* was found to have a significant main effect. Notably, though not directly related to the goals of either research question, ELA FSA and Social Studies EOC scores were significantly higher than all other tests scores. District scores in Math and Science ranked in the middle and were not significantly different from each other. Achievement scores improved from one year to the next in English, Mathematics, and Social Studies, but not in Science. Again, despite these interesting statistics not being of particular relevance to this study, they certainly provide insights into Florida's academic performance in different subject areas which deserve the attention of Florida's educators, policymakers, and funding agencies in their own right.

Limitations and Recommendations for Future Research

It is important to review some of the limitations of this study. For one, using *district* as the unit of analysis and therefore looking at aggregated data means that the results lack a nuanced perspective. However, as mentioned before, this is hopefully the first step to understanding patterns across the state; in the future, school- and student-level performance and concerns could be analyzed both statistically and qualitatively to perhaps better explain the results obtained here. Furthermore, because of the need for all variables to come from the same year in order to ensure validity, data regarding racial and ethnic breakdowns by district could not be used. District classifications do change, and the most recent year they are available from NCES is 2015–2016; demographic data for school enrollment from NCES were not available from that same period. A possible way for future research to add demographic variable(s) would be to extrapolate county-level data from the American Community Survey (ACS). The second research question, which looked at over-time changes, does assume that district classifications did not change over one year (from 2016–2017), which is not necessarily guaranteed; however, it is valid nonetheless to record changes over time in the same location, particularly over such a short period of time.

Perhaps the clearest apparent limitation are the unequal numbers of districts within each of the four classifications. There are only five city districts, which potentially calls into question the verity of any observed patterns in academic performance. However, the reported assessment aggregated pass rate percentages do represent a large number of students; enrollment totals in city schools exceed those of other districts. In terms of statistical violations, they were relatively minor and accounted for in the Methodology section.

One could also raise the issue with using the district level; that is, all school districts in Florida (aside from four private ones related to special services) are at the county level. A single county, in reality, can have highly dense urban populations, suburban areas, and rural neighborhoods, which does create a challenge when it comes to classifying sprawling areas with differing population densities. However, official district classifications (despite their flaws) can impact school funding, resource allocation, and job demand, and it is this classification's impact that the researchers were interested in examining with this study. Population density is certainly an aspect that is encompassed within the classification, but other factors that are harder to define may be intrinsically connected to the classification status as well. Future research should consider using county's population data as a covariate in the analysis.

Finally, the two research questions—as they were combined into this one study from two initially separate analyses—also looked at slightly different assessments for their composite DVs. As was noted previously in the Data and Methodology section, the Biology EOC exam was only utilized in the first research question and the Social Studies EOC was only chosen for the second research question. The three remaining assessments were the same for both and used the same dataset in SPSS. The researchers elected not to re-run the analyses with the exact same assessment data, as it was interesting to observe the same trends in district performance by locale despite the disparity between the assessments being viewed. Similarly, both Wilks' lambda

(Research Question #1) and Pillai's Trace (Research Question #2) were used by each researcher to report results. Ultimately, findings were very similar and comparable, adding validity to the conclusions of both analyses.

Conclusion

Though minor statistical violations mean that these results should be used with caution, findings of both analyses indicate that the rural-urban education gap is clearly present in the state of Florida. We wish to call attention to this matter, seek proposals to help bridge the evident geographic gap, and invite educators from other states to similarly explore the district performance data of their own regions. Further research could also look into specific achievement tests as well as the potential interactions between the type of test and the year (or changes over time). Additionally, what other variables aside from percentage of ELLs and students with IEPs could increase the explanatory power of the models presented in this study? Does population density itself impact academic performance? What exactly is happening within each individual school to create a statewide pattern of improved performance as location moves closer to city centers? Results could inform changes in policy that help bridge the gap between all students in Florida's public schools.

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