Is There a Benefit to Upper Elementary Departmentalization?
A District Level Analysis

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ABSTRACT

The shift from the traditional self-contained classroom to the departmentalized classroom structure in upper-elementary classrooms is increasing as the pressure to maximize student outcomes is higher than ever for public schools. Teachers prefer departmentalization but findings as to its benefits for students are mixed. This study considers the relationship between classroom structure and student achievement and whether the relationship varies by student socio-economic status. Using fourth grade data from one school district in Florida, we use Ordinary Least Squares (OLS) regression and logistic regression to examine the relationship between departmentalization and three measures of student achievement based on the Florida Standards Assessment. The findings indicate a negative relationship between all three measures of student achievement and classroom structure with some variation by student socio-economic status.

KEYWORDS

classroom structure, departmentalization, achievement

INTRODUCTION

The pressure on traditional public schools to help students perform to their maximum potential is higher than ever before as they battle varying entities and lobbyists competing for elusive funding (Kim, 2020; Labree, 2018). Despite increasing pressures on the public schools to perform, achievement gaps between White students and students of color, as well as between students from low socio-economic status (SES) families and those from wealthier families, continue to grow (Carnoy & Garcia, 2017). Accordingly, the stress level of teachers has reached an all-time high with high rates of turnover and shortages prevalent across the country (McCarthy, 2019).

To simultaneously meet the needs of students while working to structure schools in ways to recruit and retain effective teachers, decision makers in education are trying a variety of strategies. The strategy analyzed in this study is departmentalization. A departmentalized classroom structure is in contrast to the traditional self-contained elementary classroom structure. In a self-contained classroom, students receive instruction in all academic content areas from the same teacher (Lobdell & van Ness, 1963; Markworth et al., 2016; Otto & Sanders, 1964; Parker et al., 2017), whereas in a departmentalized classroom, students receive instruction from a different teacher based on the academic content (Gewertz, 2014; Lobdell & van Ness, 1963; Markworth et al., 2016; Parker et al., 2017;

Webel et al., 2017). In the current educational climate, there are an increasing number of upper elementary classrooms implementing the departmentalization strategy. (Barseghian, 2011; Gerwertz, 2014; Mulvahill, 2016; Parker & Rakes, 2020).

This trend holds true in the district of this study, with 58% of fourth graders engaging in departmentalized classes for the 2019 school year. Seventy-six percent of fourth graders in departmentalized classes are eligible for free and reduced-price lunch (FRL), higher than the 70% of the overall fourth grade population who are eligible for FRL. This district works to cluster students by many of their needs, including having both prior-year low performing clusters and gifted and high achieving clusters, but the classroom structure students are exposed to does not intentionally vary based on their needs. As a district whose own mission statement includes priding itself on providing exceptional educational opportunities that motivate and engage each student, this study asks, can student demographic information be used to schedule students more strategically into a specific classroom structure?

The intent of this study is to learn more about current classroom structure practices and if they could be applied more strategically to certain groups of students. In this study, the focus is on students from low socio-economic backgrounds and the relationship between student achievement and classroom structure. To do this, the proficiency and gains scores for fourth grade students within one specific district on the 2019 Florida Standards Assessment for Math

and English Language Arts (ELA) were examined. Proficiency refers to measuring whether or not a student is working at grade level. Gains scores measure if a student has made one year's academic progress during the year.

To address the relationship between student achievement and two classroom structures, this study asks,

1) What is the relationship between classroom structure and upper elementary student achievement?

2) Does this relationship vary by student socio-economic status?

LITERATURE REVIEW

Although compounded with issues of school choice, teacher burnout, and employee shortages, educational decision makers need to ensure that classrooms are structured to meet the needs of both the students and the teachers. The data consistently show that teachers prefer departmentalization (Gerretson et al., 2014; Liu, 2011; Minott, 2016; Strohl et al., 2014), but, is that the classroom structure most beneficial to students? And, if so, is the level of benefit the same for all types of students?

The opportunity to focus on planning lessons for fewer content areas is consistently cited as a teacher-perceived benefit of departmentalization. Across multiple studies, teachers who engage in departmentalization have higher levels of job satisfaction and low levels of leaving the profession due to job-induced stress (Gerretson et al., 2008; Liu, 2011; Strohl et al., 2014). It is critical that students receive accurate and effective instruction, and teachers who engage in departmentalization have the additional time to focus on dissecting the standard, choose appropriate resources, and write efficient and effective lessons (Webel et al., 2017). However, despite these benefits, departmentalization continues to generate student performance levels that are similar to those in self-contained classrooms (Parker et al., 2017).

Defining Departmentalization and Self-Containment

Departmentalization, for the purpose of this study, is defined as any variety of a teacher instructing one content area to multiple groups of students. This includes any variation where the homeroom teacher for the student and the teacher of record for either ELA or math is different. Departmentalization as a classroom structure is increasingly becoming prevalent in elementary classrooms in comparison to its counterpart, the traditional self-contained classroom structure, where one teacher instructs all content areas to one group of students for the entire school day (Gerretson et al., 2008). The decision to structure classrooms as departmentalized versus self-contained varies from district to district and school to school, both in methods of implementation as well as who ultimately makes the decision. There are reports of parents being wary of departmentalization when it has been introduced in the elementary level, but the method continues to increase in prevalence across schools that serve students from all socio-economic backgrounds, even when parents raise concerns (Delvisco & Muffs, 2007; Gewertz, 2014). Given the increased prevalence of departmentalization at the upper elementary level for students of all socio-economic statuses, it is critical to examine knowledge of the effectiveness of this structure and the student it benefits.

Educator Preferences

The perspective of potential and practicing educators is important to consider. Pre-service teachers have mostly positive feelings towards departmentalization as they appreciate the ability to specialize in an area and have focused planning time, but there are concerns about teaching larger numbers of students as well as logistics of ensuring there is enough dedicated time for each content area (Liu, 2011; Minott, 2016). The administrative perspective on departmentalization continues to showcase the ideological preference educators have for the idea of departmentalization as a classroom structure. Educators currently in the classroom as well as the district and site based administrative supervisors share the philosophy that engaging in departmentalization streamlines the content a teacher has to prepare, leading potentially to increased lesson quality (American Association of School Administrators, 1965; Rogers, 2012).

Self-contained Classrooms and Content Connectedness

The prevalence of departmentalization as a structure used in grade four is increasing in comparison to its counterpart, the self-contained classroom (Gerretson et al., 2008). However, when comparing overall student achievement as measured by standardized tests, the research comparing departmentalized classrooms to self-contained classrooms at the elementary level shows no statistical difference between the two classroom structures (Gewertz, 2014; Lobdell & van Ness, 1963; Parker et al., 2017). However, self-contained classrooms have readily accessible opportunities for teachers to connect information across content areas, an important strategy for increasing student achievement for students from low SES backgrounds

Students from low SES backgrounds have been shown to have poor background knowledge and lower ability to make cross-curricular connections without explicit instruction (Neumen et al., n.d.). These cross-curricular connections occur more often in the self-contained classroom which naturally has cross-curricular connections and have been shown as an effective strategy for building background knowledge in students of all races and socio-economic backgrounds (Aslan, 2016). In order for students to synthesize knowledge across content areas, the interrelatedness of content areas needs to be explicitly addressed. Specifically, each of the different strands of knowledge requires reinforcement through the lens of the other content areas, a process which has shown to be most effective and occurs with highest frequency in a self-contained classroom (Lobdell & van Ness, 1963).

Socio-economic Status and Educational Outcomes

Socio-economic status is frequently studied in relation to educational outcomes, with students from low SES backgrounds having lower achievement as compared to students from backgrounds with average SES backgrounds (Carnoy & Garcia, 2017; Faaz & Khan, 2017; Quinn et al., 2016; Zhang et al., 2020). This pattern is also demonstrated specifically in fourth grade students (Faaz & Khan, 2017). Although the relationship between low SES and lower levels of student achievement is consistent across studies and age groups, the relationship between race and student achievement is inconclusive (Quin et al., 2016). Although there are patterns as to the relationship between race and student outcomes, with students of color typically underperforming their

White peers, the most consistent demographic predictors of student achievement are the socio-economic background of the family and school the student attends (Carnoy & Garcia, 2017; Faaz & Khan, 2017; Quinn et al., 2016; Zhang et al., 2020). Carnoy and Garcia (2017) found that while the achievement gaps between White and Black students and White and Hispanic students are decreasing, the achievement gap between students from higher SES and lower SES backgrounds has increased. However, Ladson-Billings (2010) cautions that when discussing SES, high SES is often associated with whiteness and low SES associated with blackness. To be clear, this study only considers the SES of the students, and not their racial background.

Academic Outcomes

There are few peer reviewed studies that analyze differences in student achievement between departmentalized or self-contained classroom structures. The studies that do have mixed findings, with studies finding student achievement higher for a specific content area in one classroom structure and another finding student achievement lower for that same content area in the same classroom structure (Baroody, 2017; Kent, 2010; Koch, 2013; McGrath & Rust, 2002; Nelson, 2014; Webel et al., 2017; Yearwood, 2011). This supports the need for additional research to add to the base of knowledge, especially given the inconsistency in the research findings of benefits to student achievement. McGrath and Rust (2002) analyze student achievement levels across content areas. Their study found an increase in student achievement levels for self-contained classes in the area of ELA but no difference for math (McGrath and Rust, 2002). A peer reviewed study conducted in 2017 by Baroody also looked at ELA and math scores and found slightly higher scores for students who engaged in reading instruction in a departmentalized structure, but no difference in math scores; this is a juxtaposition to other studies by Yearwood (2011) and Nelson (2014) which found higher achievement levels in math. Similarly, one of the few peer reviewed studies on this subject by Webel et al. (2017) also found higher achievement scores for math within the departmentalized classroom structure. Taken together, the existing research base is mixed as to the benefits of departmentalization for student achievement.

Educators are striving to ensure outcomes are equitable for all students across all demographics by providing for the needs of each student. Students from low SES backgrounds typically have lower levels of background knowledge, that is, prior exposure to related content, than their more affluent peers (Carnoy & Garcia, 2017, Faaz & Khan, 2017; Quinn et al., 2016; Zhang et al., 2020). For students from a low SES background, it is critical that they not only receive explicit instruction in relevant background knowledge, but that the connections between content areas are specifically taught (Neumen, et al., n.d.). Self-contained classrooms more frequently provide for explicit instruction of background knowledge and strategic teaching of the interrelatedness and reinforcement of the varying content areas (Aslan, 2016; Lobdell & van Ness, 1963). It has repeatedly been found that self-contained classrooms engage low income students at a higher level in part because of the cross-curricular connections and reinforcement through all content areas (Aslan, 2016; Lobdell & van Ness, 1963; Neumen et al., n.d.).

In order to analyze the relationship between student achievement and classroom structure, this study seeks to analyze the relationship between departmentalization and self-contained class structures and student achievement and discern if that relationship varies by student SES.

METHODS

To address the relationship between departmentalization and fourth grade student achievement, scores were compared across fourth grade standard curriculum classrooms within the district and a regression analysis was conducted specifically looking at students receiving FRL. All fourth grade students and classrooms in traditional public elementary schools in the district were analyzed. At the time of the study, individual school administrations and staffs choose the type of classroom structure, and this can vary both between grade levels as well as within one grade level. The study examines the student data collected after the students completed the 2018-2019 academic year in the chosen classroom structure. The sample choice of all fourth classrooms (n=29) in the district allows for data on numerous classrooms and ensures that there is a sampling of both types of classroom structures.

Local Context

The district is located in a large state and has a student population just under 50,000. The demographics of the district are diverse, with 52% of students of Hispanic descent, 33% White, and 11% Black. Sixty-five percent of the students are from homes with a low SES background as indicated by those students receiving FRL, and 55% are from homes where English is not the primary spoken language. Sixteen percent of students are current English Language Learning (ELL) students demonstrating limited English proficiency. There are schools with high populations of migrant students, who make up almost 7% of the district population. Almost 14% of students receive Exceptional Student Education (ESE) services, not inclusive of an additional 7% of students who receive gifted services. However, these demographics are not evenly split among all of the schools in the district. Of the twenty-nine elementary schools, seventeen are currently Title I schools with over 75% of the students eligible for FRL. Proficiency levels in the district's elementary schools are consistent with the expectations based on demographics, with most Title I schools underperforming the schools that serve families with high SES. The lowest performing school in the district has a reading proficiency level of 30% and is also a Title I school. The lowest performing non-Title I school has a reading proficiency level of 67%.

Table 1. Sample School Demographic Percentages within the District

	School 1	School 2	School 3
Male	52.78	50.69	50.79
Female	47.22	49.31	49.21
FRL	99.4	60.74	34.68
ESE	19.85	14.29	14.65
ELL	43.16	12.8	7.33

Seventeen of the elementary schools are Title I. Five of the schools are located within a small, rural, migrant farm worker town, three within one incorporated city, one within another incorporated city, and the remainder in the unincorporated areas of the county. Table 1 shows a sample of the demographic differences across the district. It showcases three schools from the district including the

highest and lowest percentage of students on free or reduced-price lunch (FRL) and the percent of their student populations in each category. The demographics of the schools above demonstrate the full diversity of students engaged in each classroom structure.

Without a district-wide directive on classroom structure, it is determined at each school by administrative staff and teacher input. Departmentalization as a classroom structure has been in the district for some time now. This increase in popularity began after the implementation of the Florida Standards in 2012. This study is viewing the results after departmentalization has been implemented.

Sample

The sample is the fourth grade students who took the Spring 2019 ELA (English Language Arts), Florida Standards Assessment (FSA), and Math FSA in a district in south Florida from the twenty-nine traditional public elementary school standard curriculum classrooms. The decision to departmentalize is determined at the school level. For that reason, the demographic makeup of the sample is not identical in the treatment, departmentalized, and control, self-contained groups. District wide demographics are presented in Table 2. Descriptive statistics for the analytic sample are presented in Table 3. Of note is the difference between the overall district eligibility of all students, Pre-K to grade 12, for FRL at 64% and the sample of fourth grade students at 69%.

Analytic Strategy

Broadly, student achievement is the dependent variable for both research questions. Student achievement is measured in three different ways using the Spring 2019 ELA FSA and Math FSA test results. We use 2019 FSA data because state testing was cancelled in 2020 as a result of the COVID-19 pandemic. The three data measures are the FSA scale score, whether the student is proficient, and the state determination if a student made achievement gains. Scale score is a three-digit continuous scale score. The definitions of proficiency and gains come from the Florida Department of Education (FLDOE) (2019). Proficiency is defined as a score of at least a level three on the five-level scale. Learning gains are determined to have happened if a student meets any of the following criteria: moves up a level, maintains a level five, maintains a level three or four while increasing their scale score by at least one point, or by moving up a sub-level, from low to mid or mid to high one, or from low two to mid two. The learning gain designation is determined

if a student moves up from one level designation to another (FLDOE, 2019). The relationship between the levels, scale scores, and gains is displayed in Table 4.

The independent variables vary by research question. For the first research question: "What is the relationship between the departmentalized and self-contained classroom structures and upper elementary student achievement?" the independent variable is the classroom structure. Classroom structures is a binary variable where departmentalized classroom is as any variation of at least one academic content area instructed by a teacher other than the one instructing the remainder of the academic content areas. Self-contained classrooms only include classrooms where all core academic subjects are taught by the same teacher or teachers all day. Departmentalized classrooms include any deviation from all core academic subjecting being taught by the same teacher or teachers all day. The variables included for research question one are summarized in Table 5.

Table 2. Demographics of the District

Demographic Group	Overall District
Male	51.59%
Female	48.41%
Hispanic	52.35%
White	32.38%
Black	11.43%
Eligible for Free or Reduced-Price Lunch	64.09%
ESE Status: Active	14.1%
ELL Status: Active	15.38%

Table 3. Demographic Descriptive Statistics of the Sample

	Overall	Self-Contained	Departmentalized
	Mean (SD)	Mean (SD)	Mean (SD)
Sex (Male)	0.51 (0.500)	0.50 (0.500)	0.53 (0.499)
White	0.28 (0.451)	0.36 (0.480)	0.23 (0.420)
Black	0.11 (0.312)	0.09 (0.282)	0.13 (0.331)
Hispanic	0.57 (0.495)	0.50 (0.500)	0.62 (0.486)
ESE Status	0.17 (0.374)	0.15 (0.356)	0.18 (0.386)
ELL Status	0.35 (0.478)	0.30 (0.459)	0.39 (0.489)
Eligible for FRL	0.69 (0.462)	0.60 (0.489)	0.76 (0.430)

Table 4. Learning Gain Eligibility vs. Scale Score Range

FSA Level	Minimum Requirement for Learning Gain	Scale Score Range for 2019 FSA ELA Levels	Scale Score Range for 2019 FSA Math Levels
Low 1	Move from Low 1 to Mid 1	4th Grade: 251-296	4th Grade: 251-298
Mid 1	Move from Mid 1 to High 1	5th Grade: 257-303	5th Grade: 256-305
High 1	Move from High 1 to Low 2		
Low 2	Move from Low 2 to High 2	4th Grade: 297-310	4th Grade: 299-309
High 2	Move from High 2 to 3	5th Grade: 304-320	5th Grade: 306-319
3	Scale Score + 1 and Maintain Level 3	4th Grade: 311-324	4th Grade: 310-324
		5th Grade: 321-335	5th Grade: 320-333
4	Scale Score + 1 and Maintain Level 4	4th Grade: 325-339	4th Grade: 325-339
		5th Grade: 336-351	5th Grade: 334-349
5	Maintain Level 5	4th Grade: 340-372	4th Grade: 340-376
		5th Grade: 352-385	5th Grade: 350-388

Table 5. Variables for Research Question 1: What is the Relationship Between Classroom Structure and 4th Grade Student Achievement?

Variable	Categories	Type of Variable	Range	
Dependent Variable				
Classroom Structure	Self-Contained	Binary	0	
	Departmentalized	Binary	1	
Independent Variable				
Student Achievement	FSA Scale Score	Continuous	4th Grade ELA	251-372
			5th Grade ELA	257-385
			4th Grade Math	251-376
			5th Grade Math	256-388
	Proficiency	Binary	No	0
			Yes	1
	FSA Gains Made	Binary	No	0
			Yes	1

The independent variables vary by research question. For the first research question: "What is the relationship between the departmentalized and self-contained classroom structures and upper elementary student achievement?" the independent variable is the classroom structure. Classroom structure is a binary variable where departmentalized classroom is as any variation of at least one academic content area instructed by a teacher other than the one instructing the remainder of the academic content areas. Self-contained classrooms only include classrooms where all core academic subjects are taught by the same teacher or teachers all day. Departmentalized classrooms include any deviation from all core academic subjecting being taught by the same teacher or teachers all day. The variables included for research question one are summarized in Table 5.

For the second research question, there is an additional independent variable of interest. This question seeks to provide further analysis as to the relationship in the first question by analyzing if the relationship between classroom structure and student achievement varies by student SES. This is also a binary variable, with 0 being No and 1 being Yes.

In order to determine the classroom structure, the definition of departmentalization as having a different teacher for any scheduled academic content area was used. In this district, students are scheduled specific time blocks for three subjects, ELA, math, and science. We looked at each student's scheduled teacher for each subject, ELA, math, and science, as compared to their homeroom teacher. If a student had a different teacher for any one of those subjects, then that student was determined to be receiving instruction in a departmentalized classroom structure. If the teacher was the same for all three academic components the student was determined to be in the self-contained classroom structure. The name, job title, and school of each homeroom teacher was compared to ensure that any scheduling irregularities, including teachers of record being those who provide ESE support services versus full time instruction, were categorized correctly.

One of the measures of student achievement analyzed is gains. In order to determine gains, the student's scale scores from the previous year, the 2018 FSA, as compared to their 2019 FSA score were used. If the students increased by one level, as determined by the FLDOE, it is determined that the student made gains.

A descriptive analysis of all of the variables in order to give context to the data set using the Statistical Package for the Social Sciences (SPSS) was provided. For each variable, the mean and standard deviation were calculated. The first research question seeks to measure the relationship between classroom structure and student achievement. To control for demographics also related to student achievement, the Ordinary Least Squares (OLS) and logistic regression were used. The general regression equation takes the following form:

$$Y_{ic} = \beta_0 + \beta_1 CLASS_i + \beta_1 Race_i + \beta_2 Sex_i + \beta_3 SES_i + \beta_4 ESE_i + \beta_4 ELL_i + \beta_5 GHA_i + \beta_6 Low25_i + \beta_7 FY18SS + \varepsilon_i \quad (1)$$

Where Y_{ic} is the measure of student achievement as measured via scale score for student i, CLASS is a binary indicator for student i's classroom structure, Race is a vector of binary variables indicating if student i's race as being a member or not of the three most populous races in the district, White or not, Black or not, or Hispanic or not; Sex is a binary indicator of student i's sex; SES is a binary indicator of whether student i receives FRL; ESE is a binary indicator of whether student i has an Individualized Education Plan; ELL is a binary indicator of whether student i is categorized as an English Language Learner; GHA is a binary indicator of whether student i is categorized as gifted or high achieving; Low25 is a binary indicator of whether student i previously performed in the lowest twenty-five percent of students in either ELA or math; FY18SS is a continuous variable of the student's Scale Score for the prior year; and ε_i is an error term.

The second research question seeks to understand if the relationship in the first research question varies by student SES. To do this, we use OLS and logistic regression with the following general equation:

$$Y_{ic} = \beta_0 + \beta_1 Y + \Upsilon_1 Race_i + \Upsilon_2 Sex_i + \Upsilon_3 SES_i + \Upsilon_4 ESE_i + \Upsilon_4 ELL_i + \Upsilon_5 GHA_i + \Upsilon_6 Low25_i + \Upsilon_7 FY18SS + \varepsilon_i$$

Separate models for students who are eligible for FRL and those who are not were estimated.

RESULTS

There were 2,945 fourth grade students in the analytic sample. Of those, 1233 (42%), received instruction in a self-contained classroom, while 1712 (58%) participated in a departmentalized

class. There is a greater number of students in departmentalized classes who are on FRL, with 76% of departmentalized students receiving FRL, as compared to only 60% of students in a self-contained class. This data is displayed in Table 6.

Table 6. Sample Descriptive Statistics

	Overall	Self-Contained	Departmentalized
	Mean (SD)	Mean (SD)	Mean (SD)
Classroom Structure	0.58 (0.49)		
SEX	0.51 (0.50)	0.50 (0.50)	0.53 (0.50)
ELA Proficiency Level	0.59 (0.49)	0.66 (0.47)	0.55 (0.50)
ELA Scale Score	315.09 (19.22)	318.11 (18.93)	312.91 (19.14)
ELA Made Gains	0.57 (0.49)	0.61 (0.49)	0.55 (0.50)
Math Proficiency Level	0.68 (0.47)	0.73 (0.44)	0.65 (0.48)
Math Scale Score	319.28 (21.56)	321.93 (21.44)	317.38 (21.45)
Math Made Gains	0.69 (0.46)	0.73 (0.44)	0.65 (0.48)
White	0.28 (0.45)	0.36 (0.48)	0.23 (0.42)
Black	0.11 (0.31)	0.09 (0.28)	0.13 (0.33)
Hispanic	0.57 (0.50)	0.50 (0.50)	0.62 (0.49)
ESE Status	0.17 (0.37)	0.15 (0.36)	0.18 (0.39)
ELL Status	0.35 (0.48)	0.30 (0.46)	0.39 (0.49)
Eligible for FRL	0.69 (0.46)	0.60 (0.49)	0.76 (0.430)
GHA Status	0.43 (0.50)	0.46 (0.50)	0.42 (0.49)
ELA Low 25%	0.28 (0.45)	0.28 (0.45)	0.29 (0.45)
Math Low 25%	0.28 (0.45)	0.28 (0.45)	0.28 (0.45)
N	2945	1233	1712

Research Question One

Tables 7 and 8 display the regression results for research question one. The data show statistically significant results for all measures of achievement for both ELA and math. Departmentalized classroom structures are associated with a statistically significant decrease in student achievement in both content areas, no matter the outcome measure of academic achievement. Comparing ELA and math, while there is a negative relationship of departmentalization to achievement across the board, the magnitude of relationships is slightly less in math than ELA. For ELA achievement, the departmentalized classroom structure is associated with a scale score that is 1.790 points lower than the self-contained classroom structure, about 9% of a standard deviation.

Additionally, students in departmentalized classrooms are 0.589 times less likely to show proficiency and 0.756 times less likely to make gains in ELA. In the area of math, departmentalized classroom structures are associated with students whose scale score is 1.335 points lower, about 6% of a standard deviation, and those students are 0.703 times less likely to be proficient and 0.653 times less likely to make gains.

Table 7. Overall Relationship Between Classroom Structure and Academic Achievement – Scale Score

	ELA	Math
	Scale Score	Scale Score
Classroom Structure	-1.790***	-1.335***
	(0.352)	(0.397)
Sex	-1.648***	0.888**
	(0.345)	(0.391)
White	-1.469	-0.417
	(0.918)	(1.037)
Black	-3.022***	-2.640**
	(1.035)	(1.172)
Hispanic	-1.903***	-1.636
	(0.920)	(1.040)
ESE Status	-1.754***	1.138**
	(0.495)	(0.555)
ELL Status	-1.507***	-1.395***
	(0.415)	(0.464)
Eligible for FRL	-1.507***	-3.639***
	(0.415)	(0.510)
GHA Status	-4.292***	4.861***
	(0.454)	(0.510)
ELA Low 25%	-13.940***	-1.723***
	(0.479)	(0.516)
Math Low 25%	-2.555***	-14.428***
	(0.445)	(0.542)
FY18 Scale Score	0.467***	0.599***
	(0.14)	(0.15)
N	2951	2948
R Squared	0.771	0.768

Note: Standard errors in parentheses

Table 8. Overall Relationship between Classroom Structure and Academic Achievement – Proficiency and Gains

	ELA		Math	
	Proficiency	Gains	Proficiency	Gains
Classroom Structure	0.589***	0.756***	0.703**	0.653***
	(0.000)	(0.004)	(0.011)	(0.000)
Sex	0.745**	0.689***	1.074	1.041
	(0.017)	(0.000)	(0.589)	(0.694)
White	1.569	0.749	1.436	1.217
	(0.246)	(0.259)	(0.415)	(0.522)
Black	0.904	0.415***	0.736	0.746
	(0.806)	(0.002)	(0.508)	(0.370)
Hispanic	1.186	0.648*	0.815	0.827
	(0.653)	(0.088)	(0.635)	(0.527)

	ELA		Math	
	Proficiency	Gains	Proficiency	Gains
ESE Status	0.875	0.615***	1.126	1.250
	(0.446)	(0.000)	(0.488)	(0.103)
ELL Status	0.610***	0.686***	0.730**	0.789**
	(0.000)	(0.001)	(0.030)	(0.040)
Eligible for FRL	0.269***	0.489***	0.356***	0.463***
	(0.000)	(0.000)	(0.000)	(0.000)
GHA Status	2.625***	2.325***	2.397***	2.334***
	(0.000)	(0.000)	(0.000)	(0.000)
ELA Low 25%	0.048***	0.074***	0.828	0.678***
	(0.000)	(0.000)	(0.205)	(0.002)
Math Low 25%	0.627***	0.626***	0.083***	0.066***
	(0.001)	(0.000)	(0.000)	(0.000)
FY18 Scale Score	1.084***	0.965***	1.113***	0.986***
	(0.000)	(0.000)	(0.000)	(0.001)
N	2951	2951	2948	2948

Note: Odd ratios are provided with p-values in parentheses

Research Question Two

When considering students eligible for FRL in comparison to those who are not, there is a statistically significant negative relationship between student achievement and departmentalization for both groups of students in both subjects and across all outcomes. The results of the second regression analysis looking specifically at student achievement across SES is presented in Tables 9 and 10. These models demonstrate statistically significant negative relationships between student achievement and departmentalization that does vary by student SES.

There is a negative relationship between departmentalization for all students across all models. However, students from low SES backgrounds in departmentalized classrooms perform worse on the ELA FSA than their peers from higher SES backgrounds in departmentalized classrooms. On average, ELA scale scores are 2.132 points lower, about 11% of a standard deviation, for low SES students in a departmentalized classroom than their low SES self-contained peers. In comparison, there is a non-significant result for departmentalized students from a high SES background compared to like peers in self-contained classrooms. When looking at both proficiency and gains, the relationship varies slightly. For ELA, departmentalization for low SES students has a more negative relationship with student achievement than for high SES students, but the difference is small. High SES students are 0.518 times less likely to be proficient when in departmentalized classrooms rather than self-contained compared to low SES students at 0.595 times less likely. The gains scores follow the same pattern, with high SES students 0.749 times less likely to have made gains compared to low SES students with a 0.778 times less likely chance to make gains.

The relationship between SES and achievement is different for math. For the math scale score, the relationship is opposite to that in ELA achievement: High SES students in a departmentalized structure score 1.959 points lower, about 9% of a standard deviation, than their self-contained high SES peers. In contrast, departmentalized low SES students only score 1.114 points lower on average, about 5% of a standard deviation, than their self-contained low SES peers. Proficiency and gains are also higher for students in departmentalized classrooms from low SES backgrounds as compared to their high SES background peers, but the relationship between departmentalization and student achievement remains negative for both groups. The difference between proficiency and gains levels is more pronounced for math than for ELA. For math proficiency, high SES students in departmentalized structures are 0.611 times less likely to be proficient than their high SES peers in self-contained classrooms. In comparison, low SES departmentalized students are 0.732 times less likely to be proficient than low SES students in self-contained classrooms. The difference in gains is even more pronounced; high SES students are 0.537 times less likely to make gains when departmentalized as compared to low SES students who are 0.684 times less likely to make gains when departmentalized. Taken together, this suggests that both high and low SES students in departmentalized classrooms fare worse in terms of student achievement than their peers in self-contained classrooms.

DISCUSSION AND IMPLICATIONS

The data show a negative relationship between student achievement and departmentalization. This is consistent across all measures of student achievement and both ELA and math. In ELA, students from a low SES background fare even worse in departmentalized classrooms on average compared to their high SES peers. For math, although low SES background students in a departmentalized class still perform worse than their self-contained peers, there is a less negative relationship between achievement and departmentalization than their high SES peers. Put simply, departmentalized students across both high and low SES backgrounds were less likely to be proficient in comparison to their self-contained peers. In both the areas of ELA and math, fourth grade students have higher levels of student achievement when engaged in the self-contained classroom structure.

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Table 9. Relationship Between Classroom Structure and Academic Achievement by SES – Scale Score

	ELA High SES	ELA Low SES	Math High SES	Math Low SES
Classroom Structure	-1.027 (0.639)	-2.123*** (0.423)	-1.959*** (0.723)	-1.114** (0.477)
Sex	-1.570** (0.641)	-1.651*** (0.410)	0.750 (0.730)	0.940** (0.463)
White	-0.922 (1.227)	-2.042 (1.454)	-0.400 (1.392)	-0.007 (1.636)
Black	-0.218 (2.163)	-3.774**** (1.450)	-4.813** (2.439)	-1.512 (1.638)
Hispanic	-1.326 (1.326)	-2.485 ** (1.372)	-2.904* (1.504)	-0.565 (1.546)
ESE	-2.220** (1.062)	-1.626*** (0.559)	-0.169 (1.206)	1.534** (0.623)
ELL	-1.977 (1.227)	-1.454*** (0.422)	0.768 (1.381)	-1.751*** (0.492)
ELA Low 25%	-12.673*** (0.995)	-14.337*** (0.545)	-2.325** (1.075)	-1.576*** (0.587)
Math Low 25%	-3.528*** (0.949)	-2.418*** (0.503)	-13.710*** (1.122)	-14.588*** (0.620)
GHA Status	3.210*** (0.837)	4.988*** (0.552)	4.093*** (0.955)	5.224*** (0.605)
FY18 Scale Score	0.505*** (0.205)	0.450*** (0.017)	0.602*** (0.028)	0.598*** (0.018)
N				
R Squared	0.704	0.746	0.711	0.750

Note: For Scale Score models, standard errors in parentheses

Table 10. Relationship Between Classroom Structure and Academic Achievement by SES – Proficiency and Gains

	ELA High SES		ELA Low SES		Math High SES		Math Low SES	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.518**	0.749*	0.595***	0.778**	0.611	0.537***	0.732**	0.684***
	(0.021)	(0.089)	(0.000)	(0.027)	(0.102)	(0.003)	(0.047)	(0.002)
Sex	0.618*	0.644***	0.782*	0.716***	0.815	1.057	1.164	1.045
	(0.086)	(0.009)	(0.078)	(0.002)	(0.496)	(0.794)	(0.306)	(0.709)
White	2.390	0.838	1.195	0.680	1.205	1.209	1.833	1.384
	(0.109)	(0.580)	(0.753)	(0.358)	(0.790)	(0.651)	(0.297)	(0.458)
Black	0.749	0.649	0.748	0.317***	1.921	0.855	0.934	0.952
	(0.744)	(0.433)	(0.602)	(0.006)	(0.526)	(0.809)	(0.904)	(0.910)
Hispanic	1.417	0.792	0.948	0.487*	0.443	0.530	1.149	1.092
	(.0539)	(0.500)	(0.920)	(0.070)	(0.257)	(0.147)	(0.800)	(0.831)
ESE	1.081	0.380***	0.818	0.750*	0.765	0.688	1.220	1.498**
	(0.840)	(0.000)	(0.313)	(0.064)	(0.482)	(0.186)	(0.302)	(0.010)
ELL	1.092	0.775	0.567***	0.724***	1.313	1.224	0.677**	0.740**
	(0.846)	(0.434)	(0.000)	(0.006)	(0.551)	(0.577)	(0.013)	(0.017)
ELA Low 25%	0.033***	0.069***	0.051***	0.069***	0.776	0.776	0.829	0.638***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.425)	(0.350)	(0.271)	(0.001)
Math Low 25%	1.424	0.187	0.505***	0.593***	0.081***	0.074***	0.081***	0.062***
	(0.280)	(0.726)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GHA Status	2.565***	1.413	2.691***	2.833***	2.117*	1.738*	2.494***	2.638***
	(0.010)	(0.125)	(0.000)	(0.000)	(0.082)	(0.051)	(0.000)	(0.000)
FY18 Scale Score	1.017***	0.956***	1.088***	0.968***	1.099***	0.978**	1.116***	0.989**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.000)	(0.019)
N	908	908	2043	2043	909	909	2039	2039
R Squared								

Note: For Proficiency and Gains, odd ratios are provided with p-values in parentheses

At the local level, the greatest potential impact is on future scheduling practices, especially when attempting to increase proficiency and gains. For Florida, both proficiency and gains determine a school and district's rating by the Department of Education. This makes decisions that have a potential impact on those areas critical for increasing student achievement to increase school and district's FLDOE ratings. Based on this study, both students from low SES and high SES backgrounds in fourth grade have lower levels of student achievement when instructed in the departmentalized structure. For this reason, the recommendation is that fourth grade students not be scheduled into departmentalized classes.

The results of the study are limited in that the study only focuses on student achievement. The application of the results is also limited by the study's relatively small size, as it focuses on only one school district representing one geographical area. The decision of classroom structure relies heavily on the teacher's school administration. Prior academic proficiency data of the teacher and school as well as reasons for engaging in either classroom structure were not a part of this study. Additionally, the secondary results pertain to individual student SES, which, as shown in Table 1, vary significantly throughout the district, whereas a further area of study would be seeking to compare the classroom structure and achievement levels by school wide SES, Title I designation, as well as the prior academic proficiency and gains performance of the school.

CONCLUSION

The purpose of the study was to explore the relationship between student achievement and classroom structure and to see if that relationship varies depending on student SES. In summary, there is a statistically significant relationship between classroom structure and student achievement with a negative relationship between departmentalized classrooms and ELA and Math scale scores, proficiency, and gains as measured on the 2019 FSA. The relationship remains consistent when analyzing students from high and low socio-economic backgrounds separately. However, the relationship does show a slightly more negative relationship between student achievement and departmentalized classroom structures for students from a low socio-economic background in ELA and a higher socio-economic background in math. New ideas, which come from the continual process of improvement in action research, could expand the study by adding in reasons for engaging in classroom structure, teacher and school prior performance, and Title I status of the school the student attends. A field-based approach would allow a doctoral student to analyze a problem of practice relating to any of these areas and develop solutions that are of value to their institution in alignment with the Carnegie Project on the Education Doctorate guiding principles.

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