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Achievement Analysis by Subgroup: Is There a Benefit to Intermediate Departmentalization?

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FLORIDA STATE UNIVERISTY
COLLEGE OF EDUCATION

ACHIEVEMENT ANALYSIS BY SUBGROUP: IS THERE A BENEFIT TO
INTERMEDIATE DEPARTMENTALIZATION?

By

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I dedicate this dissertation to the memory of my grandfather, Hy Bershada. In the writing of his autobiography, titled *The Life Story of an Ordinary Man*, Grandpa shares how he spent his entire life working for the good of all people. Through his influence I am inspired to be the good.

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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 stakes are higher than ever for public schools. Teachers prefer departmentalization but findings as to its benefits for students are mixed. I consider the relationship between classroom structure and student achievement and whether the relationship varies by the subgroup, including race, sex, socio-economic status (SES), student with disability (SWD) status, English language learner (ELL) status, or Gifted High Achieving (GHA) status. Using fourth and fifth grade data from one school district in Florida, I use OLS and logistic regression to examine the relationship between departmentalization and three measures of student achievement based on the Florida Standards Assessment. I find an overall negative relationship between student achievement and classroom structure in fourth-grade, with some variation by student subgroup. The fourth-grade data shows consistency where students from underserved groups are more negatively impacted by departmentalization than their peers. The fifth-grade data is not significant and does not indicate that there is a relationship between student achievement and classroom structure.

CHAPTER 1

PROBLEM OF PRACTICE, PURPOSE, AND RESEARCH QUESTIONS

The pressure is on for public education to increase educational outcomes for all of its students. Not only do districts have to compete with private and charter schools to retain students and the money that comes with each student, they also have to show increasing levels of student achievement or risk further negative financial impacts. Despite all of the pressure to perform, achievement gaps continue to grow, especially for students in high poverty schools, members of certain racial and ethnic groups, or learning English as a second language in comparison to their peers (Carnoy & Garcia, 2017). Additionally, the level of stress for teachers is at an all-time high with teacher turnover and shortages prevalent across the country (McCarthy, 2019).

Educational professionals are trying anything and everything to simultaneously meet the needs of the students while creating environments conducive to attracting and retaining highly qualified teachers. To meet these needs, an increasing number of classrooms are turning to the use of an alternative classroom structure, departmentalization (Barseghian, 2011; Mulvahill, 2016). Departmentalization is an alternative to the traditional elementary school classroom structure, which is referred to in educational literature as “self-contained.” The self-contained classroom structure is when a group of students receives instruction in all academic content areas from the same instructor (Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Otto & Sanders, 1964; Parker, Rakes, & Arndt, 2017), whereas departmentalization’s defining characteristic is that students receive instruction separately from different teachers based on an academic area (Gewertz, 2014; Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Parker, Rakes, & Arndt, 2017; Webel, Conner, Sheffel, Tarr, & Austin, 2017).

The implementation of departmentalization is fairly simple for schools, but at what cost? The departmentalized classroom structure is based, at best, on research that shows mixed results for increasing standardized tests scores (Parker et al., 2017). Moreover, although limited, the research supporting the traditional classroom structure, the self-contained classroom, is fairly consistent in its findings that the structure is beneficial for students from low socioeconomic backgrounds (Aslan, 2016; Lobdell & van Ness, 1963). In contrast to the lack of research supporting departmentalization as impactful for increasing student achievement, departmentalization is overwhelmingly preferred by elementary school teachers, both preservice and those currently employed (Gerretson, et al., 2008; Liu, 2011; Strohl, Schmertzling, Shermertzling, & Hsiao, 2014). This is significant because keeping people joining and staying in the teaching profession is critical to being able to provide high quality teachers for our students.

The rising popularity of departmentalization is visible even when looking at the recent history of just one school within my district. In 2017, this school had six teachers out of thirty-seven engaging in departmentalization. The following school year that number expanded to twelve, and the following year fifteen, with the entirety of the fourth and fifth grades having only departmentalized classroom structures. However, the school did not see an increase in student achievement, and, in those grade levels specifically, they saw a decrease. Yet, when the administration approached the classroom teachers about the student achievement concerns the teachers were insistent it was not the classroom structure, and that any change in classroom structure would not make a difference in student achievement. The teachers kept insisting it was how the students have “changed” over the years, referring, unfortunately, to the changing demographics of the student population within the school and the district.

The school district in question has gaps in student achievement levels. Socio-economic and racial trends in achievement vary and are visible throughout the elementary schools. Of the twenty-nine elementary schools in the county, the lowest school serving a low income population has a reading proficiency average of 67%. In contrast, the lowest reading proficiency level of a low income school is 30%. The schools with higher proficiency rates have majority white populations, including every school with a proficiency rating over 74%. The demographics of the school district have also changed over time. The racial makeup of the students has gotten more diverse in recent years and the district has experienced an increase in the number of students eligible for free or reduced-price lunch. There are now so many socio-economically disadvantaged students that the majority of elementary schools qualified for Title I status for the 2018-2019 school year for the first time in the history of the district. This district classifies a Title I school as one where 75% or more of the population qualifies for free or reduced-price lunch (Study Site Data).

In order for educational outcomes to become equitable among students from all backgrounds, classrooms need to ensure they are meeting the differentiated needs of each member of the classroom community. Traditionally, students from low socio-economic backgrounds have poor background knowledge and lower ability to make cross-curricular connections with explicit instruction (Neumen, Kaefer, & Pinkham, n.d.). Additionally, the performance disparity between elementary schools, and the racial and socioeconomic homogeneity of the student population at each elementary school, is typically higher than local middle or high school counterparts, often due to the smaller geographic areas from which they pull students (Vanlaar, Reardon, & Kalogrides, 2014). Although the achievement gap between students of color and their white counterparts has been getting smaller, students from low socio-

economic levels have an increasing achievement gap between their more affluent peers, and, Hispanic and black children are more likely to be poor than white children (Carnoy, Garcia, & Economic Policy Institute, 2017).

The district this study takes place in already provides a variety of educational services based on student need. The students within the district are eligible to qualify for various educational programs. The goal of these programs is to provide differentiated instruction in order to ensure student success. The programs offered at the specific school include ESE (Exceptional Student Education) services to those students who have an IEP (Individualized Education Plan), ELL (English Language Learner) services to those students who are learning English as a second language, and the Cambridge Primary Program for students who are identified as gifted and high achieving and whose parents have chosen to opt them in. Yet, despite the varying needs of students in these programs, departmentalization as a classroom structure is applied equally to all types of students. It is critical as educators who are making decisions that impact student achievement that we ensure the targeted groups of students in our classrooms are receiving the appropriate kind of instruction in an environment that is most beneficial to them.

The purpose of this study is to analyze the relationship between classroom structure and student achievement, specifically, between the Florida Standards Assessment (FSA) mathematics and English Language Arts (ELA) performance of the fourth and fifth grade students and the classroom structure the tested students participated in during the academic year. The student achievement data will be analyzed by the students' demographic subgroups as well. The intention of the study is to identify if there are subgroups of students who show statistically higher achievement on the FSA while receiving instruction in one classroom structure over

another. The next section will go into further detail of the specific research questions and design of the study.

Purpose, Research Questions, and Study Design

The purpose of the study is to identify whether a subgroup of students show greater learning gains or proficiency levels in either a departmentalized or self-contained classroom structure. To address this I ask the following questions:

- What is the relationship between classroom structure and upper elementary student achievement?
- Does the relationship vary by student race, sex, SES, SWD status, ELL status, or Gifted High Achieving status?

The intention of this outcomes study is to learn more about the efficiency of current classroom structure practices and if they could be applied more strategically to certain groups of students. To do this I study the scale scores, proficiency, and gains scores for students taking the fourth and fifth grade Florida Standards Assessment for Math and English Language Arts. Proficiency refers to measuring whether or not the student is working at grade level. Gains scores measure if the student has made one year's academic progress during the assessed year. The scores were compared across all fourth and fifth grade standard curriculum classrooms within the district and an analysis was done for each subgroup. The subgroups analyzed are race, sex, socio-economic status (SES), student with disability (SWD) status, English language learner (ELL) status, gifted or high achieving (GHA) status, previously low performing as measured on the prior year FSA (lowest 25%).

The study was quantitative in nature and focused on an analysis of student FSA ELA and Math scores from the Spring 2019 exam¹. All fourth and fifth grade students and classrooms in the traditional public elementary schools within the district were part of the data analyzed. Charter and private schools were not included due to lack of access to data regarding scheduling practices. Currently, and at the time of the study, individual school administrations and staffs choose which type of classroom structure to engage in, and this can vary both between grade levels as well as within one grade level. This was the policy during the 2018-2019 academic year, the year the study takes place in. The study looks at student data collected after the students have completed the 2018-2019 academic year in the chosen classroom structure and will therefore be ex post facto. The sample choice of all fourth through fifth grade classrooms in the district allows for a large amount of data to include both self-contained and departmentalized structures broader than just those at my current school. The inclusion of all elementary schools (N=29) ensures that there is a sampling of both types of classroom structures at each grade level as there are classrooms of both types in both grade levels. A description of the demographics of the schools involved, including school size, number of classrooms and the structures they engage in, and prior student achievement scores, is discussed in Chapter 3. The next section discusses in further detail the district the study takes place in as well as the feasibility of implementation of the study.

Study Site Overview and Feasibility

The district the study takes place in is located in a large state and has a student population just under 50,000. The district is diverse, with about 52% of students of Hispanic descent, 33% White, and 11% Black. Sixty-five percent of the students are economically needy, and 55%

¹ State testing for 2020 was cancelled due to the COVID19 pandemic.

come from homes where English is not the primary spoken language. Sixteen percent of students are current ELL students demonstrating limited English proficiency. There is a pocket of schools with high populations of migrant students, who make up almost 7% of the district population. Almost 14% of students receive 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. Of the twenty-nine elementary schools, seventeen are currently low-income schools, with over 75% of the students eligible for free or reduced-price lunch. Proficiency levels in the district's elementary schools range consistent with what would be expected based on demographics. The lowest performing school has a reading proficiency level of just 30%, and is also a low-income school. The lowest performing school not serving a low-income population has a reading proficiency level of 67% (Study Site Data).

The proposed research design and data collection methods intend to analyze student achievement and learning gains and not any other outcomes that could result from varying classroom structures. The intention of the study is to see if there is a consistent pattern in student performance between two classroom structures and the patterns by student characteristics including by content area, SES status of the students, ESE status of the students, Gifted/High Achieving classification of the students, ELL status of the students, low performing status of the students, sex of the students, and race of the students. The data collection will focus specifically on the students in my district in grades four and five. At the beginning of the academic year students are scheduled into individual courses with instructors listed for each content area receiving instructional minutes – Math, English Language Arts, and Science. At the end of the academic year the students take the mandatory state assessments in ELA and Math. The student performance on the FSA ELA and FSA Math sections, as compared to a level of proficiency,

scale score, and as compared to previous student performance via learning gains, is the simplest form of gathering data that provides outcome results of student academic achievement.

Permission to access the data was granted by the Office of Accountability and Data Management and District Research Committee on June 8, 2020.

Departmentalization as a classroom structure has been in the district for some time now, with an increase in popularity after the implementation of the Florida Standards in 2012. The outcome nature of the study, looking at results after a program, in this case, departmentalization, has been implemented, also supports the design of the study, as teachers and administrators will be self-selecting if they are engaging in departmentalization or a self-contained classroom structure. The study is quantitative in nature and focuses on an analysis of student FSA ELA and Math scores from the Spring 2019 exam. The application of the results is limited by the study's relatively small size, as it focuses on only one school district representing one geographical area. However, the information determined through the course of the study provides additional information in an already limited area of educational research.

Significance

As we venture further into the era of accountability and school choice at the same time as facing teacher shortages and burnout we need to ensure that we are making classroom structure decisions that simultaneously meet the needs of our students and our teachers. We know that teachers prefer departmentalization, but is that beneficial for all students? And if not, who is it beneficial for?

Stress levels among teachers are at an all time high, with teacher turnover affecting up to possibly one third of those new to the profession (McCarthy, 2019). As we continue to reform and refine the education system care must be taken to ensure that we can continue to staff our

schools with qualified and effective personnel. As departmentalization as a classroom structure is evaluated from the perspective of the teachers, it is consistently the preference of classroom teachers. Teachers cite the focused lesson planning sessions, opportunity to refine and perfect lessons as they repeat them for multiple groups of students over the course of a day, and ability to further master accurate content as reasons why they would predict that teaching in a departmentalized classroom structure would make them more effective (Liu, 2011). Additionally, across multiple studies, teachers who departmentalize have higher job-satisfaction rates and lower cases of leaving the profession due to job-induced stress (Gerretson et al, 2008; Strohl, Schmertzing, Shermertzing, & Hsiao, 2014).

When students receive information that is accurate and targeted specifically to the standards, they show an increased rate of student achievement. This can happen in both self-contained and departmentalized classrooms. Accuracy of information is especially true for the content area of mathematics, where the foundational skills taught in elementary school are critical for proficiency of concepts at the higher levels. When teachers are given time to dissect standards, analyze resources, and craft accurate and effective lessons the performance of their students increases (Webel, Conner, Sheffel, Tarr, & Austin, 2017). Teachers who engage in a departmentalized classroom structure have additional time to engage in the process of standard dissection, resource analysis, and write more efficient and effective lessons (Webel, et al., 2017). Despite that extra time to craft lessons with higher accuracy, departmentalization, as stated earlier, continues to generate student performance levels similar to students in the self-contained classroom structure (Parker et al, 2017). This demonstrates that although there are benefits to the teachers regarding retention and job satisfaction, when engaging in a departmentalized classroom structure the students are not experiencing those benefits from an achievement standpoint.

To make educational outcomes more equitable for students from all backgrounds, classrooms need to ensure they are meeting the differentiated needs of each member of the classroom community, including providing background knowledge as necessary. Traditionally, students from low socio-economic backgrounds have poor background knowledge and lower ability to make cross-curricular connections without explicit instruction (Neumen, Kaefer, & Pinkham, n.d.). Self-contained classrooms lend themselves more naturally to cross-curricular connections, which have been shown as an effective strategy towards building background knowledge in students of all races and socio-economic backgrounds (Aslan, 2016). Additionally, in order for students to develop a global understanding of knowledge, 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). Although the decision to structure classrooms as self-contained versus departmentalized varies from district to district and school to school, both in methods of implementation as well as who ultimately makes the decision (district administrators, school administrators, or teachers), there are many reports of parents being wary of departmentalization when it has been introduced in the elementary level (Freeman, 2009; Gewertz, 2014).

As additional information regarding the type of student each classroom structure is most advantageous for emerges, stakeholders such as district and school-based administrators can more purposefully meet the needs of the students that subgroup. Specifically, the decision on how to cluster students into particular classroom structures can be influenced by the results of this study. Administrators stand to benefit from the information in that they continue to schedule students into varying classroom structure or provide the district guidance about best scheduling

practices. Teachers can utilize the information when determining which classroom structure, self-contained or departmentalized, they may be interested in participating in, especially as they may be changing assigned grade levels or schools within a district. As parents and students become more aware of which classroom structure is most beneficial for the subgroups they fall into they can become better advocates for themselves and their educational needs.

Conclusion

Departmentalization's popularity as a classroom structure is on the rise (Barseghian, 2011; Mulvahill, 2016). As we work towards equity in educational outcomes, is this a strategy that can be effectively universally applied to all types of students to help achieve equitable levels of proficiency and gains? If not, which types of students respond more positively to which structure? In the next chapters I further dissect these overarching questions, beginning with a review of the history and literature regarding classroom structures in Chapter 2. As I explore the history of classroom structures I analyze the varying supports for the traditional self-contained method as well as the limited current research comparing classroom structures. I then discuss in detail the methodology used to answer the research questions in Chapter 3. The final chapter discusses the results of the study and their significance.

CHAPTER 2

BACKGROUND ANALYSIS

The purpose of this study is to analyze the relationship between fourth and fifth grade student achievement and classroom structure. This information will be used to determine if there is a more purposeful way of scheduling students to potentially increase their achievement. To do this I will analyze the fourth and fifth grade student population of a school district and the classroom structure the students have for performance, measured as both proficiency as well as gains, on the Florida Standards Assessment mathematics and English language arts sections during the 2019-2020 academic year. The intention is to identify if there are subgroups of students who show higher achievement or gains on the FSA while receiving instruction in one classroom structure over another. I will investigate two classroom structures: the traditional self-contained structure and a departmentalized classroom structure. Through the remainder of this chapter I will define the two classroom structures, provide an overview of their history, describe in detail the district the study will take place in, and discuss the potential contribution of the results of the study.

Defining Departmentalization and Self-Contained Classrooms

Departmentalization, for the purpose of this study, will be defined as any variety of a teacher instructing one content area to multiple groups of students. Departmentalization as a classroom structure is becoming more and more prevalent in elementary classrooms versus 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, Bosnick, & Schofield, 2008). The decision to structure classrooms as self-contained versus departmentalized varies from district to district and school to school, both in methods of implementation as well as

who ultimately makes the decision (district administrators, school administrators, or teachers). There are reports of parents being wary of departmentalization when it has been introduced in the elementary level, but the scheduling method continues to increase in prevalence across schools that serve students from all subgroups, even when parents raise concerns (Delvisco & Muffs, 2007; Gewertz, 2014).

Despite years of work towards closing the achievement gap, there is still a significant difference between the academic performance of students from homes with low socioeconomic status and those from homes with higher socioeconomic status. Students from lower socioeconomic backgrounds typically perform lower on standardized tests. Additionally, students who are Hispanic or black have a higher likelihood of being from a home with low socioeconomic status (Carnoy, Garcia, & Economic Policy Institute, 2017; Neumen, Kaefer, & Pinkham, n.d.; Vanlaar, Reardon, & Kalogrides, 2014). Given the increased prevalence of departmentalization at the upper elementary level for students of all socioeconomic statuses, it is critical that we build on our knowledge base of the effectiveness of this structure and the type of student it benefits.

Orientation within the Larger Landscape

Departmentalized classroom structures, where a teacher instructs on only one content area and students have multiple teachers throughout the day, are associated with increases in teacher retention, self-efficacy and job satisfaction (Gerretson et al, 2008; Strohl, Schmertzing, Shermertzing, & Hsiao, 2014). The prevalence of departmentalization as a structure used in grades four and five is increasing in comparison to its counterpart the self-contained classroom (Gerretson, Bosnick, & Schofield, 2008). However, when comparing overall student achievement as measured by standardized tests, the research comparing self-contained

classrooms and departmentalized classrooms at the elementary level shows no statistical difference between the two classroom structures (Gewertz, 2014; Lobdell & van Ness, 1963; Parker, Rakes, & Arndt, 2017)

Self-contained classes have more readily accessible opportunities for teachers to connect information across content areas, an important strategy for increasing student achievement for students from low socio-economic backgrounds. Students from low socio-economic backgrounds have been shown to have poor background knowledge and lower ability to make cross-curricular connections without explicit instruction (Neumen, Kaefer, & Pinkham, n.d.). Cross-curricular connections occur more often in the self-contained classroom structure. Within self-contained classes, the same teacher instructs all content areas which lends the structure more naturally to cross-curricular connections, which have been shown as an effective strategy towards building background knowledge in students of all races and socioeconomic backgrounds (Aslan, 2016). In order for students to be able 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)

Pre-service teachers have interest in as well as both positive and negative feelings toward departmentalization. Pre-service teachers have mostly positive feelings towards departmentalization as they like the ability to specialize in an area and the focused planning time aspect, but there are also 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. Both currently in the classroom educators as well as their district and site based administrative supervisors share the philosophy regarding a streamlining of the amount of content a teacher has to prepare effective lessons on would lead to increased quality of lessons (American Association of School Administrators, 1965; Rogers, 2012).

History of Classroom Structures

The first documented appearance of departmentalization as a classroom structure was in 1789 in schools in Boston, when students received instruction from one instructor for reading and another for writing. With the addition of grade levels, the move towards self-contained instruction happened, as teachers were needed to address specific levels of students (Otto & Sanders, 1964). In the 1920s, departmentalized schools, at that time called platooned schools, gained in popularity. The popularity of departmentalization for academic content areas decreased after the forties, with the arts continuing to be departmentalized (Lobdell & van Ness, 1963).

What started as a way to break students apart by ages, the self-contained classroom, has developed into the typical elementary classroom experience. The self-contained classroom, as defined across multiple sources, is when a generalized teacher instructs all academic content areas to a single group of students throughout the day (Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Otto & Sanders, 1964; Parker, Rakes, & Arndt, 2017). This includes content areas such as reading, writing, math, science, and social studies. Art, music, physical education, and technology taught by a specialized teacher may still occur within the self-contained classroom structure. The defining characteristic of the self-contained classroom structure is that core academic subjects are all taught by the same teacher (Lobdell & van Ness,

1963; Markworth, Brobst, Ohana, & Parker, 2016; Otto & Sanders, 1964; Parker, Rakes, & Arndt, 2017).

The departmentalized classroom structure is inclusive of 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 (Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Otto & Sanders, 1964; Parker, Rakes, & Arndt, 2017). It can be as simple as a group of students having one teacher for all content areas except for writing, with the students next door having one teacher for all content areas except for math. The students would then switch instructors for just that one academic area, engaging them in the departmentalized classroom structure. The variations include different instructors in just one content area to students receiving instruction in each academic area from a separate teacher, two teachers splitting academic areas equally, or a trio or quadrant of teachers splitting academic areas, etc. The defining characteristic of the departmentalized classroom structure is that the student receives instruction separately from different teachers in different academic areas (Gewertz, 2014; Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Parker, Rakes, & Arndt, 2017; Webel, Conner, Sheffel, Tarr, & Austin, 2017). Thus, the co-teaching model, with two teachers in the same room sharing the responsibility for academic areas, is not specifically considered departmentalization (Stein, 2018). The decline and resurgence of the departmentalized classroom structure is evidenced by the gap in research relating to the structure and recent increase in studies looking at it from various perspectives.

Previous Studies Comparing Classroom Structures

Given the history and prevalence of departmentalization, there has been prior research conducted comparing classroom structures. To my knowledge, there are no studies that

compared student achievement or gain scores by subgroup according to classroom structure, like this study does, although both broad comparisons of student achievement as well as other aspects of the relationship between structures has been studied. Over the next sections I will review the literature comparing classroom structures from the following angles: educator perspectives, transition and instructional time, engagement and strong teacher-student relationships, cross-curricular connections, and finally, student achievement.

Perspectives of Educators on Departmentalization versus Self-Contained

Elementary Schools

Educators view departmentalization overwhelmingly positively. From pre-service teachers to experienced classroom teachers and administrators alike view the departmentalized classroom structure as being more time-sensitive to the work-load of teachers (Strohl, Schmertzing, Shermertzing, & Hsiao, 2014; Gerretson, Bosnick, & Schofield, 2008; Gewertz, 2014; Liu, 2011; Minott, 2016). Preservice teachers think the idea of having reduced content areas might enable them to provide more effective and focused lessons for their students, as well as additional time to provide more focused feedback to students (Liu, 2011). Administrators view departmentalization as a way to increase the number of students impacted by a teacher who shows strength in a particular content area. In contrast, the administrative perspective clarifies that the impact of a weak teacher also runs the risk of increasing in a departmentalized structure because the number of students seen by the weak teacher is higher than in a self-contained setting (American Associate of School Administrators, 1965; Rogers, 2012).

A teacher who feels he or she is stronger in a content area has shown to have higher student achievement in that area. The same goes for a teacher who performed strongly on a content specific achievement test versus the achievement of a student who had a teacher who

performed poorly on the same content area achievement test (Frome, Lasater, & Cooney, 2005; Hill, Rowan, & Ball, 2005). However, in many cases, teachers who departmentalize do so because they prefer one content area, which is often demonstrated via additional certification exams (Strohl, Schmertzling, Shermertzling, & Hsiao, 2014). Whether or not a teacher engages in a departmentalized structure because of an identified strength or weakness, it is critical that students receive information in that content area accurately and factually, especially at the foundational levels of understanding. The elementary curriculum is establishing the basic skills, across all content areas, which highlights the importance of ensuring the skills are taught in an accurate manner (Graeber, Newton, Jones, Valli, 2011; Nowicki, Sullivan-Watts, Shim, Young, Pockalny, 2012; Shulman, 1987).

Impact of Departmentalization on Instructional and Transition Time

Teachers and administrators alike are concerned about the impact on students of engaging in departmentalization, wanting to ensure that students are able to handle the variety of instructional practices and routines they would see each day and can move through the transitions without losing instructional time (American Association of School Administrators, 1965; Minott, 2016; Mulvahill, 2018; Stohl, et. al., 2014). Harris (1996) found more instructional minutes in the self-contained classroom and higher student achievement levels than in departmentalized settings. However, McGrath and Rust (2002) found no significant difference in minutes spent instructing, but similar results for student achievement levels between the two structures. McGrath and Rust's study also included an analysis of transition time, the time spent changing content areas, moving from location to location, and time engaging in other administrative tasks, versus time spent engaging in academic content. results indicated the transition time is higher for departmentalized classes. Their study anecdotally found that the time

self-contained classes saved on transitions was utilized for instruction in other areas not addressed in the departmentalized classrooms such as journaling and computer skills.

Importance of Engagement and Strong Teacher-Student Relationships

The research regarding student achievement and classroom engagement shows that when students are highly engaged their achievement is improved (Chang, Munoz, & Koshewa, 2008; Fiorlli, DeStasio, Di Chiaccio, Pepe, & Salmela, 2017; Minnott, 2016; Nicholas & Fletcher, 2017). However, the research on engagement and classroom structures has mixed outcomes. As students receive information from instructors, they must demonstrate a level of engagement with the content in order to process and retain it (Chang, Munoz, & Koshewa, 2008). Ensuring students receive information in a format they prefer and that is relevant to their lives is a key component to increasing student engagement (Fiorlli, DeStasio, Di Chiaccio, Pepe, & Salmela, 2017; Minnott, 2016; Nicholas & Fletcher, 2017). Students who cite high engagement in a subject area demonstrate higher test scores in that subject area (Chang, Munoz, & Koshewa, 2008; Fiorlli, DeStasio, Di Chiaccio, Pepe, & Salmela, 2017; Minnott, 2016; Nicholas & Fletcher, 2017). Making content relevant is just one way to increase engagement in classes. A strong teacher-student relationship can also increase student achievement, possibly by way of increased engagement. Teacher-student relationships, as a whole, have been found to be stronger in self-contained classrooms, however there are still cases where departmentalized structures lead to strong teacher-student connections (McPartland, 1987).

Cross-Curricular Connections in Departmentalized and Self-Contained Classrooms

Students need to have an appropriate amount of background knowledge to ensure they can grasp the concepts presented to them (Aslan, 2016). In a single teacher self-contained classroom structure there is one person responsible for delivering instruction for all content areas

in contrast to the multiple people responsible for delivery of instruction in a departmentalized structure. By increasing the number of people instructing content areas, you may decrease the likelihood that the information presented in each content area will have an explicit connection to others. The critical thinking skills necessary to make cross-curricular connections are a foundational skill that need explicit instruction, especially in the elementary level (Inouye & Houseal, 2018). Students who come from low socio-economic backgrounds demonstrate lower levels of background knowledge than their more affluent peers and a lower ability to make cross-curricular connections without explicit instruction and modeling of how to do so. Therefore, self-contained classrooms lend themselves naturally to greater cross-curricular connections. It has repeatedly been found that self-contained classrooms engage low-income students at a higher level in due part because of the cross-curricular connections and reinforcement through all content areas (Aslan, 2016; Lobdell & van Ness, 1963; Neumen, Kaefer, & Pinkham, n.d.).

Previous Studies Comparing Classroom Structures for Student Achievement

There are very few peer reviewed studies that analyze differences in student achievement between departmentalized or self-contained classroom structures. The studies that do exist 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). As self-contained classrooms are considered the normative structure, departmentalization has been looked at slightly more thoroughly, although rarely in a peer reviewed setting. This supports the need for additional research to add to the base of knowledge, especially given the implementation of departmentalization at schools that serve heterogeneous students and the lack of consistency in

the research findings of benefits to student achievement. McGrath and Rust (2002) analyze student achievement levels across content areas. This study was limited in that it only focused on one district, but comprehensive with all of the many lenses with which it looked at comparing the classroom structures. The structures were compared for instructional time, transitional time, and student achievement. Their study found an increase in student achievement levels for self-contained classes in the areas of language and science, but no difference for mathematics. A peer reviewed study conducted in 2017 by Barody also looked at mathematics and reading scores and found slightly higher scores for students who engaged reading instruction in a departmentalized structure, but no difference in mathematics scores, a juxtaposition to studies by Yearwood (2011) and Nelson (2014) which had found higher achievement levels in math. In further contrast, a larger peer reviewed study by Webel, Conner, Sheffel, Tarr, & Austin (2017), found contradicting results to the previously mentioned Barody peer reviewed study, with this data set revealing higher achievement scores for mathematics.

In summary, there is no conclusive evidence supporting either classroom structure when looking at it from a general student achievement perspective. However, the prevalence of both structures being implemented in schools serving students with a variety of educational and personal backgrounds ensures the need for additional research in this area. Specifically, the focus of this study, analyzing student achievement and gain scores by subgroup, provides needed information to help understand if there are types of students who may demonstrate greater achievement or gains when engaging with one classroom structure versus another. In the next section I will describe the county where the study will take place in order gain a greater understanding of the background of the students, teachers, and schools involved.

Description of the Local Context

The county encompassing the school district where the study takes place is a rapidly changing area. According to data obtained from the US Census Bureau and the district's records, the population is getting younger, but more than thirty percent of the residents are over retirement age. As a whole, the demographics of the school-aged population varies substantially from the overall population. Sixty-three percent of the population is White, non-Hispanic. However, of students enrolled in public schools, only 32% identify as White, non-Hispanic. These discrepancies are seen in other demographics within the county as well. Sixty-four percent of the students are economically needy, yet the poverty rate for the entire county is only eleven percent. Fifty-four percent of the students enrolled in the district report a home language other than English.

This study will look specifically at the fourth and fifth grade classrooms in the twenty-nine traditional public elementary schools in the district. Of the twenty-nine elementary schools in the district, each has a variety of self-contained or departmentalized structures –which change each year depending on student data, teacher strengths and input, and administrative input. These structures include self-contained structures, both a single teacher instructing one group of students, or co-teaching, where two teachers both teach all subject areas to a group of students, as well as departmentalized structures ranging from two teachers who trade one content area to three or four teachers each instructing on only one content area to a group of students. Some examples include teachers who departmentalize for just two content areas, i.e. Teacher 1 instructs Math to Group A while Teacher 2 instructs Science to Group B, then Teacher 1 instructs math to Group B while Teacher 2 instructs Science to Group A, ranging to include as much as teachers engaging in a quadruple switch, with Teacher A instructing Math, Teacher B

instructing Reading, Teacher C instructing Science, and Teacher D instructing Writing. These variations on a student schedule are shown below in Table 1.

Table 1

Sample student schedule by classroom structure

	Math	Reading	Science	Writing
Self-Contained Schedule	Teacher 1	Teacher 1	Teacher 1	Teacher 1
Two Teacher Departmentalization	Teacher 1	Teacher 1	Teacher 2	Teacher 1
Three Teacher Departmentalization	Teacher 1	Teacher 2	Teacher 3	Teacher 1
Four Teacher Departmentalization	Teacher 1	Teacher 2	Teacher 3	Teacher 4

There is no district directive on classroom structure leaving scheduling decisions to be made at each individual school through processes overseen and driven by administrative staff and teacher input.

Sixteen of the schools serve populations with more than 75% on free or reduced-price lunch. 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. Because of data access restrictions, the charter and private schools within the district will not be included in the study. There are just under seven thousand students in fourth and fifth grades at these schools, just over three thousand from each grade level. The subgroups of students included will be sex, race, free and reduced lunch status (socioeconomic status), ELL status, ESE status, gifted status, gifted and high achieving students, and previously low performing.

The demographic breakdown of the schools ranges heavily. Table 2 shows a sample of the demographic differences displayed in the district.

Table 2

Sample school demographics within studied 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

The table showcases three schools from the district, including the highest and lowest percentage of students on free or reduced lunch (FRL), and the percent of their student populations that are in each category. The demographics of the schools above demonstrate the full diversity of students engaged in each classroom structure.

Summary and Contributions of this DiP

The decision of the most effective classroom structure to implement in any given school year is one that both educators and their administrators face throughout the scheduling process. Although there is a strong amount of data that recognizes the preference teachers have towards engaging in a departmentalized structure (Strohl, Schmertzling, Shermertzling, & Hsiao, 2014; Gerretson, Bosnick, & Schofield, 2008), the research comparing self-contained classrooms with departmentalized classrooms at the elementary level shows no statistical difference between the two classroom structures or contradicts itself across multiple studies (Baroody, 2017; Lobdell & van Ness, 1963; Gewertz, 2014; Parker, Rakes, & Arndt, 2017; Webel, et. al., 2017). Given the increased prevalence of departmentalization being utilized as a classroom structure for students in all sub-groups at the upper elementary level and lack of consensus in the research regarding the impact the structure has on student achievement, it is critical that we build on our knowledge base of the effectiveness of this structure and the type of student it benefits.

There are currently very few studies analyzing the student achievement by classroom structure of districts of this size. The results of the study will be adding to the amount of recent studies comparing classroom structures for student achievement, when measured against current standards and methods of assessing students. There are no current studies comparing gains scores of students in varying classroom structures. By analyzing gain scores alongside scale scores and proficiency levels, multiple aspects of the relationship between the classroom structure and student achievement in the one specific academic year are analyzed. This is because proficient students may have possible prior knowledge carrying them to a “proficient” score. A proficient student could remain proficient year over year but not be gaining knowledge at the anticipated rate. Not gaining knowledge at the anticipated rate, as measured by whether or not the student made gains on the FSA, can indicate a decrease, or stagnation, in student knowledge, or negative relationship with the classroom structure. By maximizing gains scores, schools and districts can perform statistically higher on school and district grading scales. There are also no studies found that divide students into subgroups and analyze trends based on achievement, gains, and classroom structure. The general trend in education right now is for more and more personalized education for each student. By identifying which type of student is most benefitted by a classroom structure we can be more strategic in which students are scheduled into which classroom structure.

The next chapter outlines the methodology I use to determine the relationship between student achievement and gains scores and classroom structure. The methodology outlines the timeline of data collection, how each of the two research questions is answered, and the limitations of the study.

CHAPTER 3

INVESTIGATIVE APPROACH

Introduction and Study Type

In upper elementary school classrooms there are two predominant classroom structures being used to meet the needs of students. However, neither classroom structure has been shown to be more effective than the other (Baroody, 2017; Chang, Munoz, & Koshewa, 2008; Gewertz, 2014; Kent, 2010; Minnott, 2016; Parker, Rakes, & Arndt, 2017). The purpose of this study is twofold, to determine what the relationship between classroom structure and student achievement is, as well as to look closely at student demographics to see if different student subgroups are more positively impacted by one structure over another. The study analyzes student classroom structure and its relationship to FSA performance for the 2018-2019 academic year for all of the fourth and fifth grade students in one south Florida school district. Given that the program being evaluated by the study has been in place for a number of years the study type is an outcome study. Both sections of the FSA, English Language Arts (ELA) and Mathematics (Math) will be used viewing student level score, student scale score, and the student gain score.

Classroom structures are defined using the definitions outlined in chapter two. I am defining departmentalized classrooms 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 will only include classrooms where all core academic subjects are taught by the same teacher or teachers all day.

The research questions being addressed are:

- What is the relationship between classroom structures and upper elementary student achievement?

- Does this relationship vary by student race, sex, SES, SWD status, ELL status, Lowest 25%, or Gifted High Achieving cohort status?

The remainder of the chapter will break down the research design. The chapter will begin by outlining the sample, data collection methods, an overview of the variables, and describing the analytical process. The chapter will conclude by identifying potential limitations of the study.

Research Design

The sampling process and data sources are the same for both questions and will be discussed under the same heading. However, the analytic approach will vary for each question as there are additional variables introduced in the second research question. The two analytic approaches will be outlined by question in that section.

Sample and Selection Procedures

The study site will include all twenty-nine traditional public elementary school fourth and fifth grade classrooms in a district in south Florida totaling just under seven thousand students. The sample I will be use is the entirety of the students represented from each of the twenty-nine traditional public elementary school fourth and fifth-grade classrooms standard curriculum classrooms who took the Spring 2019 ELA and Math FSA in a district in south Florida. This will total data from 6,081 students contributing to my analyses. The research shows that there is currently no accessible data comparing the number of students engaging in departmentalized versus self-contained instruction, so we are unable to determine if the demographics of the sample match those of the overall population. The students will be in both departmentalized and self-contained classes; however, the decision to departmentalize is done at the school level. For that reason, the demographic makeup of the sample may not be the same among the treatment and control groups.

A breakdown of district wide demographics currently available is presented in Table 3, which is below.

Table 3

Current available district demographic data

Demographic Group	Overall District Data	Participant Data
Male	51.59%	52%
Female	48.41%	48%
Hispanic	52.35%	<u>56%</u>
White	32.38%	32%
Black	11.43%	11%
SES Status: Economically Needy	64.09%	70%
SWD Status: ESE	14.1%	13%
ELL Status: Active	15.38%	27%
Gifted and High Achieving Status: Cambridge Enrollment	Not currently available	51%

Data Sources

The data will be sourced in two parts, first for determining classroom structure and second for determining student achievement. The first source of data is the student schedules for the 2018-2019 academic year. In order to determine the classroom structure, I use the definition of departmentalization as having a different teacher for any scheduled academic content area. In this district students are scheduled specific time blocks for three subjects, ELA, Math, and Science. I look at each student’s scheduled teacher for each academic area, ELA, Math, and Science, as compared to their homeroom teacher. If students had a different teacher for any one of those subjects then the 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. 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. The second source of data is the student results from the Spring 2019 and Spring 2018 administrations of the Florida Standards Assessment for Mathematics and English Language Arts. Scale score and level are provided. The 2019 FSA level determined if a student is deemed to be proficient. The 2019 FSA scale score was used. Whether or not a student made gains is determined by a looking at their FSA level for 2019 as compared to 2019, and using the determination of the state, as outlined in Table 4, below:

Table 4

Learning gain eligibility vs. scale score range

FSA Level	Minimum Requirement for Learning Gain	Scale Score Range for 2020 FSA ELA Levels	Scale Score Range for 2020 FSA Math Levels
Low 1	Move from Low 1 to Mid 1	4 th Grade: 251-296	4 th Grade: 251-298
Mid 1	Move from Mid 1 to High 1	5 th Grade: 257-303	5 th Grade: 256-305
High 1	Move from High 1 to Low 2		
Low 2	Move from Low 2 to High 2	4 th Grade: 297-310	4 th Grade: 299-309
High 2	Move from High 2 to 3	5 th Grade: 304-320	5 th Grade: 306-319
3	Scale Score + 1 and Maintain Level 3	4 th Grade: 311-324 5 th Grade: 321-335	4 th Grade: 310-324 5 th Grade: 320-333
4	Scale Score + 1 and Maintain Level 4	4 th Grade: 325-339 5 th Grade: 336-351	4 th Grade: 325-339 5 th Grade: 334-349
5	Maintain Level 5	4 th Grade: 340-372 5 th Grade: 352-385	4 th Grade: 340-376 5 th Grade: 350-388

The data used in order to answer the first research question, regarding the overall relationship between classroom structure and student achievement, is the classroom structure the students received instruction in and their Spring 2019 FSA ELA and Math level on the one through five scale. The data used to answer the second research question is the same as the first,

with the addition of student demographic information included. The demographics included are race, sex, SES, SWD status, ELL status, and Gifted High Achieving cohort status.

The data was accessed in the Fall of 2020 from currently enrolled sixth and seventh grader's FSA scores, demographics, and schedules from the 2018-2019 school year.

Variables

The dependent variable for this study is consistent across both research questions - student achievement. The student achievement will be measured in three different ways based on the Spring 2019 FSA ELA and Math test results. The three dependent variables are the FSA scale score, whether the student is proficient, and the state determination if a student made gains. The scale score is the three-digit specific score that determines which level the student falls into and the gains score refers to the student performance on the FSA over two years. The study will analyze student classroom structure versus FSA performance for the 2018-2019 academic year, with gains scores being compared to student performance during the 2017-2018 year. The definitions of proficiency and gains will be consistent with the Florida Department of Education. Proficiency will be defined as a score of at least a level three on the five-level scale. Learning gains will be 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 previously displayed in Table 4. The independent variables vary by research question. For the first research question, which asks, "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 will be defined using the definitions outlined in chapter two. I am defining departmentalized classrooms 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 will only include classrooms where all core academic subjects are taught by the same teacher or teachers all day. Departmentalized classrooms will include any deviation from all core academic subjecting being taught by the same teacher or teachers all day. The classroom structure will be classified as either departmentalized or self-contained, based on these definitions (Gewertz, 2014; Lobdell & van Ness, 1963; Markworth, Brobst, Ohana, & Parker, 2016; Otto & Sanders, 1964; Parker, Rakes, & Arndt, 2017; Webel, Conner, Sheffel, Tarr, & Austin, 2017). The variables described for research question one are summarized in Table 5.

Table 5

Variables for research question 1: What is the relationship between classroom structures and upper elementary student achievement?

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

For the second research question, there are additional independent variables. This question seeks to provide further analysis as to the relationship in the first question by adding a variety of demographics. The demographics being analyzed are outlined in the question, “Does this relationship vary by student race, sex, SES, SWD status, ELL status, Lowest 25% status, or Gifted High Achieving cohort status?” As with the classroom structure independent variable, each variable will be coded as binary, using the system of 0 for no and 1 for yes. The key independent variables for research question two are further defined below in Table 6.

Table 6

Additional variables for research question 2: Does this relationship vary by student race, sex, SES (Economically Needy), SWD status (ESE), ELL status, Lowest 25% status, or Gifted High Achieving cohort (Cambridge) status?

Key Independent Variables	Categories	Type of Variable	Range
Race	Hispanic	Binary	No – 0 Yes – 1
	White		No – 0 Yes – 1
	Black		No – 0 Yes – 1
Sex	Male	Binary	0
	Female		1
SES	Economically Needy	Binary	No – 0 Yes – 1
SWD Status	ESE	Binary	No- 0 Yes – 1
ELL Status	ELL	Binary	No – 0 Yes – 1
Gifted High Achieving Cohort Status (GHA)	Cambridge	Binary	No – 0 Yes – 1

Table 6 – continued

Key Independent Variables	Categories	Type of Variable	Range
Prior Student FSA Performance (Low25)	Lowest 25% ELA	Binary	No – 0 Yes – 1
	Lowest 25% Math	Binary	No – 0 Yes - 1

Identification and Creation of Variables

In order to determine the classroom structure, each student’s scheduled teacher for ELA, Math, and Science was compared to their homeroom teacher. If students had a different teacher for any one of those components than the student was considered receiving instruction in a departmentalized classroom structure. If the teacher was the same for all three academic components the student was considered in the self-contained classroom structure. 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.

In order to determine whether or not a student made gains, their scale score was categorized into which specific level they scored in. Student’s scale scores from the 2018 FSA were categorized using the information from the Florida Department of Education guidelines for scoring for that year. A summary of the grade three and four scale score breakdown for both EA and Math are shown below in Tables 7 and 8.

Table 7

2017-2018 FSA ELA Scale Scores for Learning Gains

Assessment	Level 1			Level 2			Level 3	Level 4	Level 5	
	Level 1 Overall	Low	Middle	High	Level 2 Overall	Low				High
Grade 3	240-284	240-254	255-269	270-284	285-299	285-292	293-299	300-314	315-329	330-360

Table 7 Cont.

Assessment	Level 1			Level 2		Level 3	Level 4	Level 5		
	Level 1 Overall	Low	Middle	High	Level 2 Overall				Low	High
Grade 4	251-296	251-266	267-281	282-296	297-310	297-303	304-310	311-324	325-339	340-372
Grade 5	257-303	257-272	273-288	289-303	304-320	304-312	313-320	321-335	336-351	352-385

Table 8***2017-2018 FSA Mathematics scale scores for learning gains***

Assessment	Level 1			Level 2		Level 3	Level 4	Level 5		
	Level 1 Overall	Low	Middle	High	Level 2 Overall				Low	High
Grade 3	240-284	240-254	255-269	270-284	285-296	285-290	291-296	297-310	311-326	327-360
Grade 4	251-298	251-266	267-282	283-298	299-309	299-304	305-309	310-324	325-339	340-376
Grade 5	256-305	256-272	273-289	290-305	306-319	306-312	313-319	320-333	334-349	350-388

(FLDOE, 2017)

Student's scales scores from 2019 were then categorized into those same categories based on the 2019 scoring guidelines. A summary of the grade four and five scale score breakdown is show below in Tables 9 and 10 (FLDOE, 2018).

Table 9***2018-2019 FSA ELA scale scores for learning gains***

Assessment	Level 1			Level 2		Level 3	Level 4	Level 5		
	Level 1 Overall	Low	Middle	High	Level 2 Overall				Low	High
Grade 3	240-284	240-254	255-269	270-284	285-299	285-292	293-299	300-314	315-329	330-360
Grade 4	251-296	251-266	267-281	282-296	297-310	297-303	304-310	311-324	325-339	340-372
Grade 5	257-303	257-272	273-288	289-303	304-320	304-312	313-320	321-335	336-351	352-385

Table 10***2018-2019 FSA Mathematics Scale Scores for Learning Gains***

Assessment	Level 1			Level 2		Level 3	Level 4	Level 5		
	Level 1 Overall	Low	Middle	High	Level 2 Overall				Low	High
Grade 3	240-284	240-254	255-269	270-284	285-296	285-290	291-296	297-310	311-326	327-360
Grade 4	251-298	251-266	267-282	283-298	299-309	299-304	305-309	310-324	325-339	340-376
Grade 5	256-305	256-272	273-289	290-305	306-319	306-312	313-319	320-333	334-349	350-388

To determine if a student made gains, as referenced in Table 4, a student has to either move up

any level to the next level, or, for students who are already scoring a level 3 or 4, remain a level

3 or 4 while also increasing their scale score point by at least one, or, for students who were a level 5, maintain that level 5.

The student data provided a yes or no for whether a student was a member of each racial subgroup, including Black, Hispanic, Asian, or American Indian, a student receiving ESE services, a student who is an English Language Learner, and a student who is eligible for Free or Reduced-Price lunch. An additional column regarding student race was also provided, and this column provided the data to determine which students were considered White and Mixed. To determine if a student is in the Gifted and High Achieving cohort the student's course code for ELA, Math, and Science were looked at. Course codes ending in a C indicate that a student is part of that cohort. To determine if a student was in the Lowest 25% for ELA the district puts an asterisk, *, after their last name. If a student had the * they were coded as being in the lowest 25% for ELA. The district uses a number sign, #, next to the last name of a student who scored in the Lowest 25% for Math. If a student had the # they were coded as being in the lowest 25% for Math.

Analytic Approach

I provide a descriptive analysis of all of the variables in order to give context to the data set. For each variable I calculated the mean and standard deviation. The demographic data analyzed includes student socio-economic status by identifying those who are economically needy - measured by if they are eligible for free or reduced price lunch, students who are active ELL students, students who are active ESE students, students who are in the Cambridge Primary gifted and high achieving (GHA) cohort/program, students who are in the lowest twenty five percent (Low 25) for either content area, students from both sexes, and student race.

The first research question seeks to measure the relationship between classroom structure and student achievement. To control for demographics also related to student achievement, I use Ordinary Least Squares (OLS) and logistic regression. The general regression equation takes the following form:

$$Y_{ic} = \beta_0 + \beta_1 \text{CLASS}_i + \beta_2 \text{Race}_i + \beta_3 \text{Sex}_i + \beta_4 \text{SES}_i + \beta_5 \text{ESE}_i + \beta_6 \text{ELL}_i + \beta_7 \text{GHA}_i + \beta_8 \text{Low25}_i + \beta_9 \text{FY18SS}_i + \varepsilon_i \quad (1)$$

Where Y_{ic} is the measure of student achievement as measured via scale score for student i , CLASS is a binary indicator 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 sex, SES is a binary indicator of whether student i receives free or reduced price lunch, 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 focuses on the demographic variables from the first question. To analyze each dependent variable, a separate regression analysis was estimated. To analyze if the relationship between the classroom structure the student participated in and student achievement varies based on student demographics, ordinary least squares regression is used, running a different model for each subgroup specified in the research question, and shown above in Table 3.4. The regression equation takes the general form as follows:

$$Y_{ic} = \beta_0 + \beta_1 Y + \gamma_1 \text{Race}_i + \gamma_2 \text{Sex}_i + \gamma_3 \text{SES}_i + \gamma_4 \text{ESE}_i + \gamma_5 \text{ELL}_i + \gamma_6 \text{GHA}_i + \gamma_7 \text{FY18SS} + \varepsilon \quad (2)$$

For this equation Y is the measure of student achievement in either c classroom structure. Each variable outlined in Table 3.4 is an additional vector, as described above.

Limitations

The study is limited in that it does not include data that will allow the researcher to compare student performance by teacher attributes, including teacher experience, reason for engaging in the classroom structure they engaged in (personal preference, administrative choice based on weakness/strength, etc), and prior teacher effectiveness level. The results of the study are also limited because of how broadly the classification of departmentalization is used versus a further classification of the type of departmentalization. For example, classifying students into a duo, trio, or four-way departmentalized structure and looking for additional trends.

Summary

Discerning the relationship between classroom structure and student achievement on both a general level as well as on a sub-group specific level provides valuable insight into the future strategic implementation of a variety of classroom structures. Through the use of a quantitative outcome study I am able to identify the extent of the relationship and if there are specific students who respond better to one classroom structure versus the other. The measurement of the relationship between classroom structure and student achievement and analysis of demographic trends relies on a series of regressions. The next chapter shares the results of these regressions and potential implications of this data.

CHAPTER 4

FINDINGS, IMPLICATIONS, RECOMMENDATIONS, AND DISSEMINATION PLAN

Study Summary

The use of departmentalization as a classroom structure is increasing (Barseghian, 2011; Mulvahill, 2016). Yet, as we work to continue to provide equity in educational outcomes for all students, is this a strategy that can be effectively universally applied to students of all subgroups in order to help achieve equitable levels of proficiency and gains? By exploring what the relationship between classroom structure and student achievement is, and then comparing that relationship among varying subgroups, educators can strategically support all students while providing a work environment conducive to teacher recruitment and retention.

The purpose of the study is to identify to what extent a relationship exists between classroom structure and student achievement, specifically in fourth and fifth grades. The study will then continue its analyses, seeking to determine if the relationship varies by student subgroup. The subgroups being analyzed within this study include race, sex, socio-economic status (SES), whether a student has an IEP (SWD), if the student is learning English as a second language (ELL status), prior poor performance (Lowest 25%), or is a member of the Gifted High Achieving cohort.

In order to explore this relationship, a quantitative analysis of student performance on the Spring 2019 Florida Standards Assessment is performed. The study utilizes regression analyses to explore student achievement in ELA and Math as measured by scale score, gains made, and proficiency rates compared between students engaging in departmentalized and self-contained classrooms.

In this chapter I share the findings of the study, recommendations for the local context, and the plan for disseminating the information with the organization. The findings are presented by research question, which are:

- What is the relationship between classroom structures and upper elementary student achievement?
- Does this relationship vary by student race, sex, SES, SWD status, ELL status, Lowest 25%, or Gifted High Achieving cohort status?

Findings

I estimate separate models for fourth and fifth grade students. This section discusses the findings of research question one first, then research question two. Both sets of findings will be presented separately by grade level.

Descriptive Statistics

There are 2,945 4th 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 are a greater number of both students who are on free and reduced-price lunch and students of color in departmentalized classes. All three measures of achievement are also higher for students in the self-contained classes, as are the number of students in the gifted and high achieving program. The descriptive statistics for the fourth grade students are presented below in Table 11.

Table 11***4th Grade sample descriptive statistics***

	<u>Overall</u>	<u>Self-Contained</u>	<u>Departmentalized</u>
	Mean (SD)	Mean (SD)	Mean (SD)
Classroom Structure	0.58 (0.49)		
SEX	0.51 (0.50)	0.50 (0.50)	0.53 (0.499)
ELA Proficiency Level	0.59 (0.49)	0.66 (0.47)	0.55 (0.498)
ELA Scale Score	315.09 (19.22)	318.11 (18.93)	312.91 (19.137)
ELA Made Gains	0.57 (0.49)	0.61 (0.49)	0.55 (0.498)
Math Proficiency Level	0.68 (0.47)	0.73 (0.44)	0.65 (0.478)
Math Scale Score	319.28 (21.56)	321.93 (21.44)	317.38 (21.449)
Math Made Gains	0.69 (0.46)	0.73 (0.44)	0.65 (0.476)
White	0.28 (0.45)	0.36 (0.48)	0.23 (0.420)
Black	0.11 (0.31)	0.09 (0.28)	0.13 (0.331)
Hispanic	0.57 (0.50)	0.50 (0.50)	0.62 (0.486)
SWD Status	0.17 (0.37)	0.15 (0.36)	0.18 (0.386)
ELL Status	0.35 (0.48)	0.30 (0.46)	0.39 (0.489)
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 (0.493)
ELA Low 25%	0.28 (0.45)	0.28 (0.45)	0.29 (0.452)
Math Low 25%	0.28 (0.45)	0.28 (0.45)	0.28 (0.451)

The fifth-grade cohort consisted of 3136 students. Of that, 2533, participated in departmentalized classroom structures in 2018-19, while 603 participated in a self-contained

class. The descriptive statistics for the group are displayed below in Table 4.2, showing similar trends to those in fourth grade. All three measures of student achievement are higher for students in the self-contained class, however not as high as fourth grade. You also find more students of color and students on free and reduced-price lunch in departmentalized classes – a similar finding to the fourth-grade data. The descriptive statistics for fifth grade students are displayed in Table 12.

Table 12

5th Grade sample descriptive statistics

	<u>Overall</u>	<u>Self-Contained</u>	<u>Departmentalized</u>
	Mean (SD)	Mean (SD)	Mean (SD)
Classroom Structure	0.81 (0.394)	--	--
SEX	0.49 (0.500)	0.47 (0.500)	0.49 (0.500)
ELA Proficiency Level	0.6113 (0.48754)	0.6816 (0.46625)	0.5946 (0.49108)
ELA Scale Score	326.14 (21.472)	329.00 (21.461)	325.47 (21.423)
ELA Made Gains	0.65 (0.546)	0.68 (0.632)	0.64 (0.523)
Math Proficiency Level	0.6932 (0.46122)	0.7280 (0.44535)	0.6850 (0.46462)
Math Scale Score	329.69 (22.069)	331.73 (22.398)	329.20 (21.967)
Math Made Gains	0.66 (0.473)	0.67 (0.471)	0.66 (0.73)
White	0.32 (0.467)	0.42 (0.494)	0.30 (0.458)
Black	0.10 (0.306)	0.07 (0.260)	0.11 (0.315)
Hispanic	0.56 (0.497)	0.48 (0.500)	0.58 (0.494)
SWD Status	0.15 (0.354)	0.15 (0.355)	0.15 (0.354)
ELL Status	0.27 (0.445)	0.20 (0.402)	0.29 (0.453)

Table 12 – Continued

	<u>Overall</u>	<u>Self-Contained</u>	<u>Departmentalized</u>
	Mean (SD)	Mean (SD)	Mean (SD)
Eligible for FRL	0.69 (0.463)	0.56 (0.497)	0.72 (0.449)
GHA Status	0.48 (0.500)	0.52 (0.500)	0.47 (0.499)
ELA Low 25%	0.28 (0.447)	0.28 (0.450)	0.27 (0.446)
Math Low 25%	0.27 (0.446)	0.26 (0.437)	0.28 (0.448)

Notable regarding the fifth-grade group is that 81% of the students are in the departmentalized structure, as compared to the fourth-grade group, where only 58% were departmentalized. However, the makeup of the departmentalized versus self-contained groups were fairly similar – including 72% of the 5th grade departmentalized and 76% of the 4th grade departmentalized on free or reduced-price lunch. Hispanic for 5th grade departmentalized was 58% while 4th grade was 62%. There are additional students in the Gifted and High Achieving cohort in 5th grade, with only 43% of 4th graders participating as compared to 48% of 5th graders - however the split between departmentalized and self-contained classrooms is very similar, with both 4th and 5th grade students having 4-5% more gifted and high achieving students in a self-contained classroom.

Research Question One

Table 13, below, displays the regression results for research question one for fourth grade. The data shows 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. Additionally, students in departmentalized classrooms are 0.589 times less likely to show proficiency and 0.756 times less likely to make gains. In the area of math, departmentalized classroom structures are associated with students whose scale score is 1.335 points lower on average, and those students are 0.703 times less likely to be proficient and 0.653 times less likely to make gains, on average.

Table 13

Overall relationship between classroom structure and academic achievement – 4th Grade – scale score

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

Table 13 - continued

	ELA Scale Score	Math Scale Score
N	2951	2948
R Squared	0.771	0.768

Note: standard errors in parentheses.

Table 14

Overall relationship between classroom structure and academic achievement – 4th Grade – proficiency and gains

	ELA		Math	
	Proficiency	Gains	Proficiency	Gains
Classroom Structure	0.589*** (0.000)	0.756*** (0.004)	0.703** (0.011)	0.653*** (0.000)
Sex	0.745** (0.017)	0.689*** (0.000)	1.074 (0.589)	1.041 (0.694)
White	1.569 (0.246)	0.749 (0.259)	1.436 (0.415)	1.217 (0.522)
Black	0.904 (0.806)	0.415*** (0.002)	0.736 (0.508)	0.746 (0.370)
Hispanic	1.186 (0.653)	0.648* (0.088)	0.815 (0.635)	0.827 (0.527)
ESE Status	0.875 (0.446)	0.615*** (0.000)	1.126 (0.488)	1.250 (0.103)
ELL Status	0.610*** (0.000)	0.686*** (0.001)	0.730** (0.030)	0.789** (0.040)
Eligible for FRL	0.269*** (0.000)	0.489*** (0.000)	0.356*** (0.000)	0.463*** (0.000)
GHA Status	2.625*** (0.000)	2.325*** (0.000)	2.397*** (0.000)	2.334*** (0.000)
ELA Low 25%	0.048*** (0.000)	0.074*** (0.000)	0.828 (0.205)	0.678*** (0.002)
Math Low 25%	0.627*** (0.001)	0.626*** (0.000)	0.083*** (0.000)	0.066*** (0.000)
FY18 Scale Score	1.084*** (0.000)	0.965*** (0.000)	1.113*** (0.000)	0.986*** (0.001)
N	2951	2951	2948	2948

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

The results for fifth-grade for research question one are not significant, a trend throughout the fifth grade data. The results relating to research question one, comparing student achievement across both classroom structures, are displayed in Tables 15 and 16.

Table 15***Overall Relationship between Classroom Structure and Academic Achievement- 5th Grade – Scale Score***

	ELA	Math
	Scale Score	Scale Score
Classroom Structure	-0.144 (0.456)	0.157 (0.485)
Sex	-2.114*** (0.360)	-0.367 (0.386)
White	-0.680 (1.474)	-3.364** (1.572)
Black	-2.498 (1.572)	-4.847*** (1.681)
Hispanic	-2.489* (1.482)	-4.019** (1.581)
SWD Status	-0.526 (0.552)	0.505 (0.584)
ELL Status	-2.386*** (0.452)	-0.229 (0.479)
Eligible for FRL	-3.486*** (0.498)	-2.171*** (0.531)
GHA Status	3.755*** (0.483)	0.347 (0.520)
ELA Low 25%	-13.966*** (0.513)	-2.155*** (0.519)
Math Low 25%	-1.527*** (0.4779)	-14.935*** (0.552)
FY18 Scale Score	0.607*** (0.015)	0.614*** (0.014)
N	3136	3136
R Squared	0.787	0.771

Note: standard errors in parentheses.

Table 16***Overall Relationship between Classroom Structure and Academic Achievement- 5th Grade – Proficiency and Gains***

	ELA		Math	
	Proficiency	Gains	Proficiency	Gains
Classroom Structure	0.820 (0.229)	0.953 (0.679)	1.009 (0.960)	1.012 (0.916)
Sex	0.735** (0.012)	0.703*** (0.000)	0.759* (0.054)	0.771*** (0.003)
White	0.483 (0.319)	1.203 (0.633)	0.365 (0.431)	0.659 (0.272)
Black	0.309 (0.114)	0.822 (0.630)	0.189 (0.196)	0.543 (0.129)

Table 16 - continued

	ELA		Math	
	Proficiency	Gains	Proficiency	Gains
Hispanic	0.250* (0.055)	0.751 (0.457)	0.228 (0.246)	0.605 (0.187)
SWD Status	1.429* (0.052)	1.117 (0.405)	0.942 (0.758)	1.103 (0.447)
ELL Status	0.603*** (0.000)	0.606*** (0.000)	1.390** (0.044)	0.996 (0.971)
Eligible for FRL	0.452*** (0.000)	0.503*** (0.000)	0.465*** (0.000)	0.737** (0.010)
GHA Status	2.715*** (0.00)	3.120*** (0.000)	1.687*** (0.006)	0.955 (0.697)
ELA Low 25%	0.073*** (0.000)	0.096*** (0.000)	1.340* (0.075)	0.866 (0.210)
Math Low 25%	0.807 (0.132)	0.804* (0.056)	0.030*** (0.000)	0.070*** (0.000)
FY18 Scale Score	1.106*** (0.000)	0.970*** (0.000)	1.111*** (0.000)	0.973*** (0.000)
N	3136	3136	3136	3136

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

Across all three measures of student achievement in both math and ELA, none of the fifth grade data for research question one is significant. This means the relationship between classroom structure and student achievement in the fifth-grade level is inconsistent. A further exploration of this relationship, to determine if there are any significant relationships between classroom structure and student achievement for students of varying subgroups in both fourth and fifth grade students is explored in the second research question.

Research Question Two

Research question two seeks to determine if this relationship varies by student demographics. Each demographic is analyzed for both grade levels. The demographics are race, sex, ESE status, ELL status, socio-economic status, Gifted and High achieving status, prior performance on ELA, and prior performance in Math.

Race – White Students

The first demographic I explore is race, which is analyzed across the three largest racial subgroups – comparing white students to non-white students, Hispanic students to non-Hispanic students, and Black students to non-Black students.

White students who are in a departmentalized classroom structure in fourth grade perform better than non-white students who are in departmentalized structures. Math performance also follows that same trend. There is, however, a more pronounced negative relationship between student achievement and departmentalization in fourth grade, as shown in Tables 17 and 18.

Table 17

Relationship between classroom structure and academic achievement for White students – 4th Grade – scale score

	ELA White	ELA Non-White	Math White	Math Non-White
	SS	SS	SS	SS
Classroom Structure	-1.054 (0.651)	-2.138*** (0.422)	-1.382* (0.752)	-13.76*** (0.472)
Sex	-1.408** (0.652)	-1.736*** (0.408)	1.635** (0.759)	0.541 (0.457)
SWD	-2.378** (0.999)	-1.500*** (0.573)	0.708 (1.160)	1.293** (0.633)
ELL	-1.220 (1.733)	-1.429*** (0.429)	-1.207 (1.998)	-1.419*** (0.473)
SES	-4.498*** (0.716)	-4.592*** (0.579)	-4.250*** (0.824)	-3.504*** (0.645)
GHA	3.626*** (0.837)	4.818*** (0.554)	5.333*** (0.970)	4.635*** (0.604)
ELA Low 25%	-13.167*** (0.960)	-14.187*** (0.553)	-1.861* (1.059)	-1.666*** (0.592)
Math Low 25%	-2.170** (0.932)	-2.765*** (0.507)	-14.972*** (1.127)	-14.234*** (0.619)
FY18 Scale Score	0.473*** (0.026)	0.467*** (0.017)	0.581*** (0.030)	0.612*** (0.018)
N	838	2119	838	2119
R Squared	0.705	0.765	0.709	0.762

Note: standard errors in parentheses.

Table 18***Relationship between classroom structure and academic achievement for White students – 4th Grade – proficiency and gains***

	ELA White		ELA Non-White		Math White		Math Non-White	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.446*** (0.005)	0.691** (0.035)	0.628*** (0.002)	0.849 (0.144)	0.685 (0.212)	0.659* (0.054)	0.693** (0.020)	0.664*** (0.001)
Sex	0.604* (0.079)	0.620*** (0.006)	0.792* (0.092)	0.725*** (0.003)	1.441 (0.237)	1.351 (0.174)	1.004 (0.977)	0.980 (0.861)
SWD	0.983 (0.962)	0.346*** (0.000)	0.824 (0.336)	0.792 (0.134)	1.092 (0.818)	0.933 (0.820)	1.152 (0.461)	1.371** (0.042)
ELL	0.747 (0.631)	0.704 (0.450)	0.612*** (0.001)	0.743*** (0.009)	1.435 (0.576)	1.304 (0.629)	0.694** (0.016)	0.777** (0.037)
SES	0.226*** (0.000)	0.522*** (0.001)	0.280*** (0.000)	0.405*** (0.000)	0.318*** (0.000)	0.342*** (0.000)	0.376*** (0.000)	0.521*** (0.000)
GHA	2.939*** (0.002)	0.064 (1.527)	2.627*** (0.000)	2.754*** (0.000)	2.155* (0.061)	2.138*** (0.007)	2.468*** (0.000)	2.499*** (0.000)
ELA Low 25%	0.030*** (0.000)	0.068*** (0.000)	0.058*** (0.000)	0.071*** (0.000)	1.231 (0.543)	0.823 (0.478)	0.743* (0.075)	0.634*** (0.001)
Math Low 25%	0.907 (0.761)	0.654* (0.080)	0.566*** (0.000)	0.625*** (0.000)	0.085*** (0.000)	0.058*** (0.000)	0.082*** (0.000)	0.068*** (0.000)
FY18 Scale Score	1.065*** (0.000)	0.951*** (0.000)	1.089*** (0.000)	0.970*** (0.000)	1.118*** (0.000)	0.967*** (0.000)	1.112*** (0.000)	0.991** (0.047)
N	837	837	2114	2114	838	838	2110	2110

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

Fourth grade non-white students in departmentalized classes perform, on average, one scale score point lower on ELA FSA and more than twelve scale score points lower on Math FSA than their white peers in departmentalized classes. For fourth grade, both groups in departmentalized classrooms, white and non-white students, perform more poorly than their peers in self-contained classrooms. This is not the same for fifth grade, as shown in Tables 19 and 20. In fifth grade, none of the results for white students comparing their performance in both ELA and Math were significant.

Table 19***Relationship between classroom structure and academic achievement for White students – 5th Grade – scale score***

	ELA White	ELA Non-White	Math White	Math Non-White
	SS	SS	SS	SS
Classroom Structure	0.334 (0.719)	-0.309 (0.590)	0.228 (0.818)	0.080 (0.610)
Sex	-2.502*** (0.626)	-1.848*** (0.440)	0.791 (0.712)	-0.916* (0.456)
SWD	-1.003 (1.119)	-0.453 (0.636)	0.241 (0.847)	0.604 (0.656)
ELL	0.167 (2.243)	-2.433*** (0.470)	-0.360 (0.888)	-0.332 (0.482)
SES	-2.829*** (0.717)	-4.167*** (0.697)	-2.941*** (0.811)	-1.341 (0.724)
GHA	1.130 (0.861)	4.931*** (0.587)	-0.293 (0.989)	0.547 (0.614)
ELA Low 25%	-13.997*** (1.014)	-14.092*** (0.597)	-3.393** (1.091)	-1.736*** (0.586)
Math Low 25%	-3.001** (0.937)	-1.046* (0.559)	-14.529*** (1.138)	-15.090*** (0.629)
FY18 Scale Score	0.645*** (0.025)	0.584*** (0.018)	0.632*** (0.025)	0.606*** (0.016)
N	1010	2126	1010	2126
R Squared	0.755	0.765	0.721	0.769

Note: standard errors in parentheses.

Table 20***Relationship between classroom structure and academic achievement for White students – 5th Grade – proficiency and gains***

	ELA White		ELA Non-White		Math White		Math Non-White	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.935 (0.842)	1.085 (0.694)	0.764 (0.158)	0.912 (0.514)	1.089 (0.813)	1.038 (0.833)	0.944 (0.793)	0.962 (0.781)
Sex	0.580* (0.076)	0.800 (0.225)	0.764** (0.046)	0.674*** (0.000)	0.609 (0.113)	0.953 (0.752)	0.799 (0.165)	0.692*** (0.000)
SWD	1.163 (0.736)	0.939 (0.832)	1.465* (0.061)	1.141 (0.377)	0.654 (0.330)	1.439 (0.177)	1.022 (0.922)	0.453* (0.053)
ELL	3.403 (0.161)	1.613 (0.424)	0.587*** (0.000)	0.605*** (0.000)	1.884 (0.482)	0.914 (0.868)	1.364* (0.062)	0.958 (0.698)
SES	0.315*** (0.001)	0.459*** (0.000)	0.534** (0.014)	0.490*** (0.000)	0.445** (0.015)	0.615*** (0.004)	0.501** (0.022)	0.909 (0.562)
GHA	3.379*** (0.001)	2.287*** (0.001)	2.621*** (0.000)	3.385*** (0.000)	1.912* (0.079)	1.175 (0.454)	1.548* (0.051)	0.855 (0.276)
ELA Low 25%	0.034*** (0.000)	0.057*** (0.000)	0.092*** (0.000)	0.109*** (0.000)	1.037 (0.917)	0.561*** (0.009)	1.412* (0.068)	1.024 (0.861)
Math Low 25%	0.741 (0.364)	0.682 (0.117)	0.838 (0.266)	0.849 (0.205)	0.031*** (0.000)	0.089*** (0.000)	0.031*** (0.000)	0.063*** (0.000)

Table 20 - continued

	ELA White		ELA Non-White		Math White		Math Non-White	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
FY18 Scale	1.126***	0.962***	1.101***	0.972***	1.121***	0.974***	1.110***	0.973***
Score	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	1010	1009	2126	2124	1010	1010	2126	2126

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

Race – Hispanic Students

Where white students in fourth grade departmentalized classes performed better than their non-white peers in both ELA and math, Hispanic students in the departmentalized structure performed better than their non-Hispanic departmentalized peers in Math but worse in ELA. All three methods of measuring student achievement in ELA showed a more negative relationship for Hispanic students in a departmentalized classroom structure for fourth grade students than for Hispanic students in a self-contained class, as shown in Tables 21 and 22.

Table 21

Relationship between classroom structure and academic achievement for Hispanic students – 4th Grade – scale score

	ELA Hispanic	ELA Non-Hispanic	Math Hispanic	Math Non-Hispanic
	SS	SS	SS	SS
Classroom Structure	-2.344*** (0.467)	-1.230** (0.536)	-1.285** (0.529)	-1.677*** (0.602)
Sex	-1.508*** (0.453)	-1.888*** (0.535)	0.600 (0.515)	1.189** (0.602)
SWD	-1.282** (0.632)	-2.438*** (0.801)	1.081 (0.707)	1.293 (0.904)
ELL	-1.172** (0.476)	-2.845*** (0.831)	-1.865*** (0.529)	-0.767 (0.936)
SES	-4.141*** (0.657)	4.226*** (0.703)	-2.959*** (0.740)	-5.022*** (0.669)
GHA	4.639*** (0.610)	4.226*** (0.703)	4.622*** (0.671)	5.220*** (0.792)
ELA Low 25%	-14.233*** (0.621)	-13.407*** (0.754)	-1.740** (0.673)	-1.672** (0.810)
Math Low 25%	-2.888*** (0.565)	-2.218*** (0.723)	-14.804*** (0.697)	-13.856*** (0.866)

Table 21 - continued

	ELA Hispanic	ELA Non-Hispanic	Math Hispanic	Math Non-Hispanic
	SS	SS	SS	SS
FY18 Scale Score	0.469*** (0.018)	0.471*** (0.021)	0.604*** (0.020)	0.603*** (0.023)
N	1679	1278	1679	1278
R Squared	0.757	0.763	0.753	0.765

Note: standard errors in parentheses.

Table 22

Relationship between classroom structure and academic achievement for Hispanic students – 4th Grade – proficiency and gains

	ELA Hispanic		ELA Non-Hispanic		Math Hispanic		Math Non-Hispanic	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.563*** (0.000)	0.764** (0.032)	0.654* (0.053)	0.802 (0.125)	0.752 (0.112)	0.694** (0.010)	0.614** (0.028)	0.606*** (0.002)
Sex	0.860 (0.321)	0.720*** (0.006)	0.553*** (0.006)	0.633*** (0.001)	1.143 (0.425)	1.034 (0.807)	0.998 (0.993)	1.061 (0.715)
SWD	0.950 (0.817)	0.918 (0.618)	0.700 (0.225)	0.348*** (0.000)	1.279 (0.263)	1.235 (0.231)	0.924 (0.777)	1.323 (0.217)
ELL	0.678** (0.014)	0.805* (0.085)	0.447*** (0.006)	0.519*** (0.004)	0.693** (0.034)	0.757** (0.044)	0.764 (0.357)	0.866 (0.538)
SES	0.244*** (0.000)	0.385*** (0.000)	0.284*** (0.000)	0.538*** (0.000)	0.401*** (0.001)	0.569*** (0.007)	0.319*** (0.000)	0.367*** (0.000)
GHA	2.753*** (0.000)	2.656*** (0.000)	2.450*** (0.001)	1.959*** (0.000)	2.531*** (0.000)	2.737*** (0.000)	2.327*** (0.004)	1.988*** (0.001)
ELA Low 25%	0.054*** (0.000)	0.074*** (0.000)	0.043*** (0.000)	0.067*** (0.000)	0.669** (0.035)	0.624*** (0.004)	1.107 (0.678)	0.768 (0.176)
Math Low 25%	0.609*** (0.006)	0.620*** (0.001)	0.645* (0.065)	0.622** (0.011)	0.062*** (0.000)	0.058*** (0.000)	0.126*** (0.000)	0.080*** (0.000)
FY18 Scale Score	1.086*** (0.000)	0.972*** (0.000)	1.083*** (0.000)	0.953*** (0.000)	1.115*** (0.000)	0.990* (0.057)	1.113*** (0.000)	0.981*** (0.002)
N	1675	1675	1276	1276	1673	1673	1275	1275

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

However, for math achievement, Hispanic students in a departmentalized classroom structure had increased scale scores and likelihoods of being making gains compared to their Hispanic peers in a self-contained classroom. It should be noted that these variances are slight, with only a 0.392 difference in scale score, and 0.088 difference in likelihood of making gains. The Math proficiency results were not significant. Different than fourth grade, there were no statistically significant fifth grade results, as shown in Tables 23 and 24.

Table 23***Relationship between classroom structure and academic achievement for Hispanic students – 5th Grade – scale score***

	ELA Hispanic	ELA Non-Hispanic	Math Hispanic	Math Non-Hispanic
	SS	SS	SS	SS
Classroom Structure	-0.230 (0.644)	0.032 (0.647)	-0.057 (0.660)	0.369 (0.719)
Sex	-2.512*** (0.482)	-2.049*** (0.541)	-1.289** (0.499)	0.803 (0.605)
SWD	-0.791 (0.699)	-0.154 (0.908)	0.752 (0.715)	0.116 (0.995)
ELL	-2.479*** (0.51)	-1.805* (1.013)	-0.572 (0.519)	0.888 (1.127)
SES	-4.074*** (0.742)	-3.070*** (0.677)	-1.008 (0.763)	-3.106*** (0.751)
GHA	4.930*** (0.643)	2.237*** (0.736)	0.956 (0.672)	-0.408 (0.821)
ELA Low 25%	-13.786*** (0.654)	-14.333*** (0.835)	-1.857*** (0.638)	-2.748*** (0.876)
Math Low 25%	-1.475** (0.611)	-1.723** (0.782)	-15.387*** (0.667)	-14.216*** (0.940)
FY18 Scale Score	0.581*** (0.020)	0.634*** (0.022)	0.594*** (0.018)	0.639*** (0.022)
N	1751	1385	1751	1385
R Squared	0.763	0.785	0.763	0.766

Note: standard errors in parentheses.

Table 24***Relationship between classroom structure and academic achievement for Hispanic students – 5th Grade- proficiency and gains***

	ELA Hispanic		ELA Non-Hispanic		Math Hispanic		Math Non-Hispanic	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.807 (0.297)	0.940 (0.688)	0.783 (0.381)	0.968 (0.935)	0.955 (0.844)	0.912 (0.553)	1.058 (0.853)	1.109 (0.502)
Sex	0.687** (0.012)	0.650*** (0.000)	0.836 (0.417)	0.791 (0.109)	0.752 (0.113)	0.697*** (0.002)	0.779 (0.300)	0.872 (0.289)
SWD	1.631** (0.031)	1.168 (0.350)	1.077 (0.816)	0.987 (0.952)	1.004 (0.988)	1.020 (0.903)	0.298 (0.380)	1.235 (0.316)
ELL	0.604*** (0.001)	0.585*** (0.000)	0.619 (0.146)	0.779 (0.306)	1.487 (0.030)	0.925 (0.523)	1.115 (0.780)	1.204 (0.441)
SES	0.560** (0.031)	0.495*** (0.000)	0.353*** (0.000)	0.483*** (0.000)	0.452** (0.013)	0.947 (0.755)	0.471** (0.013)	0.610*** (0.002)
GHA	2.662*** (0.000)	3.439*** (0.000)	2.951*** (0.000)	2.622*** (0.000)	2.013*** (0.006)	1.005 (0.975)	1.268 (0.424)	0.899 (0.557)

Table 24 - continued

	ELA Hispanic		ELA Non-Hispanic		Math Hispanic		Math Non-Hispanic	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
ELA Low 25%	0.092*** (0.000)	0.107*** (0.000)	0.046*** (0.000)	0.075*** (0.000)	1.475* (0.062)	1.012 (0.936)	1.125 (0.671)	0.682** (0.035)
Math Low 25%	0.716* (0.057)	0.771* (0.067)	1.088 (0.737)	0.875 (0.493)	0.026*** (0.000)	0.061*** (0.000)	0.038*** (0.000)	0.086*** (0.000)
FY18 Scale Score	1.100*** (0.000)	0.971*** (0.000)	1.120*** (0.000)	0.967*** (0.000)	1.105*** (0.000)	0.970*** (0.000)	1.126*** (0.000)	0.977*** (0.000)
N	1751	1749	1385	1384	1751	1751	1385	1385

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

Race – Black Students

Table 25

Relationship between classroom structure and academic achievement for Black students – 4th Grade – scale score

	ELA Black	ELA Non-Black	Math Black	Math Non-Black
	SS	SS	SS	SS
Classroom Structure	-0.706 (1.153)	-1.980*** (0.368)	-1.385 (1.209)	-1.394*** (0.419)
Sex	-2.234** (1.103)	-1.610*** (0.364)	-0.214 (1.146)	0.952** (0.416)
SWD	-4.785*** (1.502)	-1.416*** (0.526)	2.610* (1.551)	0.905 (0.595)
ELL	-3.109*** (1.153)	-1.380*** (0.424)	-0.380 (1.214)	-1.901*** (0.475)
SES	-6.668*** (1.997)	-4.379*** (0.430)	-2.374 (2.139)	-4.071*** (0.487)
GHA	4.740*** (1.560)	4.459*** (0.481)	5.351*** (1.592)	1.817*** (0.540)
ELA Low 25%	-15.271*** (1.330)	-13.675*** (0.514)	-0.927 (1.315)	-1.738*** (0.561)
Math Low 25%	-2.540** (1.256)	-2.609*** (0.478)	-12.068*** (1.465)	-14.769*** (0.584)
FY18 Scale Score	0.371*** (0.045)	0.481*** (0.015)	0.587*** (0.044)	0.606*** (0.016)
N	324	2633	324	2633
R Squared	0.751	0.768	0.748	0.764

Note: standard errors in parentheses.

Table 26***Relationship between classroom structure and academic achievement for Black students – 4th Grade – proficiency and gains***

	ELA Black		ELA Non-Black		Math Black		Math Non-Black	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.829 (0.640)	1.584 (0.139)	0.554*** (0.000)	0.707*** (0.000)	0.464** (0.039)	0.550** (0.040)	0.761* (0.070)	0.672*** (0.001)
Sex	0.613 (0.188)	0.835 (0.539)	0.775* (0.053)	0.679*** (0.000)	0.755 (0.410)	0.710 (0.205)	1.166 (0.286)	1.109 (0.357)
SWD	0.419 (0.125)	0.325** (0.013)	0.976 (0.898)	0.663* (0.081)	0.730 (0.485)	2.325** (0.019)	1.204 (0.322)	1.114 (0.467)
ELL	0.337*** (0.005)	0.552* (0.061)	0.666*** (0.007)	0.712*** (0.003)	0.628 (0.175)	0.712 (0.228)	0.771 (0.106)	0.810* (0.097)
SES	0.402 (0.239)	0.235*** (0.009)	0.255*** (0.000)	0.506*** (0.000)	0.221* (0.065)	0.478 (0.172)	0.348*** (0.000)	0.462*** (0.000)
GHA	1.379 (0.523)	2.320** (0.034)	2.845*** (0.000)	2.351*** (0.000)	2.553** (0.042)	2.038* (0.059)	2.420*** (0.000)	2.384*** (0.000)
ELA Low 25%	0.087*** (0.000)	0.048*** (0.000)	0.044*** (0.000)	0.077*** (0.000)	1.097 (0.807)	0.748 (0.332)	0.782 (0.132)	0.678*** (0.004)
Math Low 25%	0.369** (0.016)	0.486** (0.036)	0.688*** (0.016)	0.650*** (0.000)	0.230*** (0.000)	0.133*** (0.000)	0.068*** (0.000)	0.058*** (0.000)
FY18 Scale Score	1.1112*** (0.000)	0.961*** (0.002)	1.082*** (0.000)	0.965*** (0.000)	1.111*** (0.000)	0.995 (0.624)	1.114*** (0.000)	0.985*** (0.001)
N	323	323	2628	2628	321	321	2627	2627

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

Fourth grade Black students did not have significant results for ELA for any of the measurements of achievement, nor were the scale score results for Math significant, as shown on Tables 25 and 26. However, there are significant ELA results showing that non-Black students in departmentalized classroom structure have lower student achievement than non-Black students in self-contained classes. Black students in departmentalized classes did have a lower likelihood of both demonstrating proficiency as well as making gains in math as compared to their non-Black peers in departmentalized classes. Fifth grade students, both Black and non-Black, had no statistically significant relationships between classroom structure and any method of measuring student achievement, as shown in Tables 27 and 28.

Table 27***Relationship between classroom structure and academic achievement for Black students – 5th Grade – scale score***

	ELA Black	ELA Non-Black	Math Black	Math Non-Black
	SS	SS	SS	SS
Classroom Structure	-0.586 (1.645)	-0.061 (0.474)	1.269 (1.785)	0.048 (0.505)
Sex	-0.349 (1.139)	-2.293*** (0.380)	-0.020 (1.250)	-0.407 (0.407)
SWD	0.525 (1.598)	-0.811 (0.059)	0.02 (1.727)	0.573 (0.623)
ELL	-1.700 (1.248)	-2.481*** (0.486)	1.659 (1.351)	-0.528 (0.514)
SES	-7.373*** (1.549)	-3.333*** (0.508)	-5.001* (2.781)	-2.033*** (0.540)
GHA	6.195*** (1.549)	3.448*** (0.509)	-0.589 (1.655)	0.454 (0.550)
ELA Low 25%	-15.088*** (1.505)	-13.807*** (0.545)	-0.727 (1.524)	-2.376*** (0.552)
Math Low 25%	1.449 (1.437)	-1.950*** (0.510)	-13.851*** (1.753)	-15.040*** (0.583)
FY18 Scale Score	0.575*** (0.047)	0.611*** (0.016)	0.643*** (0.045)	0.610*** (0.014)
N	327	2809	327	2809
R Squared	0.754	0.787	0.751	0.767

Note: standard errors in parentheses

Table 28***Relationship between classroom structure and academic achievement for Black students – 5th Grade – proficiency and gains***

	ELA Black		ELA Non-Black		Math Black		Math Non-Black	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.519 (0.234)	0.651 (0.285)	0.870 (0.420)	0.991 (0.942)	0.822 (0.741)	1.108 (0.783)	1.036 (0.856)	0.990 (0.930)
Sex	1.367 (0.368)	0.871 (0.593)	0.669*** (0.002)	0.681*** (0.000)	0.957 (0.911)	0.613* (0.067)	0.720** (0.034)	0.788*** (0.009)
SWD	0.762 (0.588)	0.951 (0.888)	1.502** (0.041)	1.117 (0.442)	1.029 (0.962)	1.063 (0.864)	0.922 (0.692)	1.117 (0.429)
ELL	0.552* (0.098)	0.751 (0.308)	0.615*** (0.001)	0.583*** (0.000)	0.980 (0.962)	1.288 (0.382)	1.485** (0.026)	0.957 (0.700)
SES	0.162 (0.126)	0.201* (0.059)	0.450*** (0.000)	0.510*** (0.000)	1.669 (0.635)	0.356 (0.130)	0.435*** (0.000)	0.763** (0.026)
GHA	2.969** (0.018)	3.625*** (0.001)	2.716*** (0.000)	3.048*** (0.000)	0.601 (0.327)	0.443** (0.026)	2.002*** (0.001)	1.044 (0.736)
ELA Low 25%	0.073*** (0.000)	0.114*** (0.000)	0.071*** (0.000)	0.093*** (0.000)	1.379 (0.510)	1.115 (0.744)	1.370* (0.076)	0.832 (0.134)

Table 28 - continued

	ELA Black		ELA Non-Black		Math Black		Math Non-Black	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Math Low 25%	2.147* (0.063)	1.612 (0.152)	0.698** (0.019)	0.728*** (0.000)	0.055*** (0.000)	0.065*** (0.000)	0.027*** (0.000)	0.071*** (0.000)
FY18 Scale Score	1.110*** (0.000)	0.977** (0.034)	1.105*** (0.000)	0.969*** (0.000)	1.139*** (0.000)	0.980** (0.036)	1.108*** (0.000)	0.972*** (0.000)
N	327	327	2806	2809	327	327	2809	2809

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

Sex

To analyze student performance for this subgroup, achievement outcomes were evaluated comparing males to females. Broadly, in fourth grade the ELA scores for males in the departmentalized classroom structure were lower than their female peers. In math, Females in a departmentalized classroom structure scored lower in all three measure of student achievement as compared to their self-contained peers. Tables 29 and 30 display the results for fourth grade.

Table 29

Relationship between classroom structure and academic achievement by sex – 4th Grade – scale score

	ELA Male	ELA Female	Math Male	Math Female
	SS	SS	SS	SS
Classroom Structure	-1.822*** (0.488)	-1.665*** (0.504)	-1.128** (0.553)	-1.539*** (0.568)
White	-2.797** (1.253)	0.151 (1.337)	-0.604 (1.428)	-0.048 (1.506)
Black	-3.742*** (1.433)	-2.073 (1.487)	-1.790 (1.638)	-3.217* (1.676)
Hispanic	-2.749** (1.264)	-0.694 (1.333)	-0.918 (0.525)	2.096 (1.502)
SWD	0.081 (0.749)	-3.051*** (0.662)	2.643*** (0.848)	0.196 (0.739)
ELL	-2.323*** (0.587)	-0.800 (0.666)	-1.883*** (0.658)	-1.037 (0.654)
SES	-3.968*** (0.615)	-4.597*** (0.666)	-4.361*** (0.696)	-2.868*** (0.748)
ELA Low 25%	-12.722*** (0.696)	-14.931*** (0.659)	-0.881 (0.759)	2.286*** (0.707)
Math Low 25%	-3.047*** (0.612)	-2.057*** (0.647)	-14.568*** (0.743)	-14.386*** (0.789)

Table 29 - continued

	ELA Male	ELA Female	Math Male	Math Female
	SS	SS	SS	SS
GHA Status	4.081*** (0.630)	4.912*** (0.666)	4.461*** (0.718)	5.313*** (0.725)
FY18 Scale Score	0.493*** (0.019)	0.436*** (0.020)	0.601*** (0.022)	0.598*** (0.021)
N	1439	1518	1439	1518
R Squared	0.767	0.771	0.769	0.769

Note: standard errors in parentheses.

Table 30

Relationship between classroom structure and academic achievement by sex – 4th Grade – proficiency and gains

	ELA Male		ELA Female		Math Male		Math Female	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.620*** (0.009)	0.790* (0.077)	0.566*** (0.002)	0.750** (0.030)	0.839 (0.373)	0.692** (0.014)	0.562*** (0.004)	0.608*** (0.001)
White	1.334 (0.621)	.673 (0.288)	1.816 (0.255)	0.836 (0.618)	0.686 (0.603)	1.319 (0.507)	2.930* (0.069)	1.196 (0.690)
Black	0.832 (0.764)	0.341*** (0.008)	0.975 (0.964)	0.504* (0.084)	0.613 (0.515)	1.173 (0.726)	0.800 (0.713)	0.521 (0.166)
Hispanic	0.948 (0.925)	0.590 (0.156)	1.483 (0.441)	0.727 (0.370)	0.466 (0.286)	1.037 (0.929)	1.239 (0.705)	0.698 (0.411)
SWD	0.995 (0.984)	0.724 (0.107)	0.774 (0.298)	0.541*** (0.001)	1.467 (0.148)	1.801*** (0.006)	0.924 (0.725)	0.970 (0.866)
ELL	0.517*** (0.001)	0.511*** (0.000)	0.725 (0.110)	0.898 (0.478)	0.876 (0.528)	0.803 (0.188)	0.599** (0.013)	0.759* (0.088)
SES	.264*** (0.000)	0.500*** (0.000)	0.272*** (0.000)	0.469*** (0.000)	0.236*** (0.000)	0.391*** (0.000)	0.585** (0.052)	0.550*** (0.004)
ELA Low 25%	0.060*** (0.000)	0.082*** (0.000)	0.036*** (0.000)	0.067*** (0.000)	1.164 (0.508)	0.810 (0.255)	0.629** (0.019)	0.587*** (0.001)
Math Low 25%	0.672** (0.037)	0.631*** (0.003)	0.559*** (0.008)	0.609*** (0.004)	0.070*** (0.000)	0.063*** (0.000)	0.087*** (0.000)	0.066*** (0.000)
GHA Status	2.548*** (0.000)	1.861*** (0.000)	2.807*** (0.000)	2.939*** (0.000)	2.664*** (0.000)	2.43*** (0.000)	2.240*** (0.000)	2.268*** (0.000)
FY18 Scale Score	1.083*** (0.000)	0.967*** (0.000)	1.087*** (0.000)	0.962*** (0.000)	1.125*** (0.000)	0.985** (0.012)	1.103*** (0.000)	0.987** (0.022)
N	1436	1436	1515	1515	1434	1434	1514	1514

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

The fourth-grade results show a more negative relationship for males in departmentalized classrooms when it comes to ELA achievement and for females in departmentalized classrooms when it comes to Math achievement, specifically scale score and gains. For males, scale scores for ELA are approximately 0.157 points lower, however males are only 0.236 times less likely to

be proficient in a departmentalized structure, as compared to females who are 0.570 times less likely to be proficient in a departmentalized structure. That relationship reverses for gains scores, with males 0.191 times less likely to make ELA gains than their female peers.

The math achievement results are indicating females are more negatively impacted by departmentalization, with a decreased likelihood of being proficient or making gains and a lower scale score. Although females are more negatively impacted, the relationship between student achievement and departmentalized classroom structure for male students is still negative across all three measures of student achievement.

The fifth-grade results are displayed in Tables 31 and 32. None of the results in fifth grade for sex are significant.

Table 31

Relationship between classroom structure and academic achievement by sex – 5th Grade – scale score

	ELA Male SS	ELA Female SS	Math Male SS	Math Female SS
Classroom Structure	-0.298 (0.633)	0.050 (0.659)	-0.075 (0.642)	0.357 (0.730)
White	0.343 (2.338)	-1.536 (1.903)	0.492 (2.370)	-5.496*** (2.113)
Black	-2.469 (2.458)	-2.294 (2.060)	-1.405 (2.495)	-6.508*** (2.295)
Hispanic	-1.787 (2.346)	-2.981 (1.916)	0.334 (2.378)	-6.714*** (2.130)
SWD	-0.476 (0.850)	-0.662 (0.727)	1.084 (0.853)	0.220 (0.804)
ELL	-1.881*** (0.648)	-2.902*** 0.632	0.210 (0.651)	-0.720 (0.304)
SES	-3.427*** (0.697)	-3.553*** (0.714)	-2.489*** (0.708)	-1.975** (0.790)
ELA Low 25%	-13.207*** (0.749)	-14.695*** (0.707)	-1.708** (0.721)	-2.353*** (0.744)
Math Low 25%	-1.387** (0.673)	-1.610** (0.687)	-14.709*** (0.723)	-15.472*** (0.839)
GHA Status	4.275*** (0.671)	3.225*** (0.699)	0.783 (0.696)	0.088 (0.775)

Table 31 - continued

	ELA Male	ELA Female	Math Male	Math Female
	SS	SS	SS	SS
FY18 Scale Score	0.615*** (0.022)	0.599*** (0.020)	0.576*** (0.019)	0.645*** (0.020)
N	1603	1533	1603	1533
R Squared	0.773	0.793	0.764	0.780

Note: standard errors in parentheses.

Table 32

Relationship between classroom structure and academic achievement by sex – 5th Grade – proficiency and gains

	ELA Male		ELA Female		Math Male		Math Female	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.910 (0.677)	0.838 (0.290)	0.737 (0.206)	1.098 (0.565)	0.766 (0.298)	0.946 (0.721)	1.343 (0.271)	1.083 (0.604)
White	0.456 (0.494)	0.551 (0.454)	0.480 (0.439)	1.739 (0.231)	0.948 (0.970)	0.780 (0.682)	0.016 (0.470)	0.631 (0.344)
Black	0.226 (0.198)	0.401 (0.260)	0.399 (0.345)	1.107 (0.836)	0.374 (0.500)	0.710 (0.589)	0.011 (0.427)	0.469 (0.146)
Hispanic	0.239 (0.207)	0.414 (0.265)	0.238 (0.127)	0.906 (0.829)	0.536 (0.664)	0.804 (0.720)	0.011 (0.423)	0.514 (0.174)
SWD	1.198 (0.504)	0.883 (0.543)	1.638* (0.053)	1.332 (0.105)	0.948 (0.857)	1.254 (0.265)	0.903 (0.699)	1.047 (0.788)
ELL	0.562*** (0.002)	0.591*** (0.001)	0.660** (0.039)	0.620*** (0.001)	1.495* (0.075)	1.159 (0.348)	1.291 (0.284)	0.871 (0.350)
SES	0.452*** (0.004)	0.427*** (0.000)	0.456*** (0.005)	0.579*** (0.002)	0.463** (0.011)	0.588*** (0.002)	0.477** (0.022)	0.887 (0.473)
ELA Low 25%	0.092*** (0.000)	0.095*** (0.000)	0.058*** (0.000)	0.097*** (0.000)	1.035 (0.883)	0.785 (0.152)	1.762 (0.018)	0.963 (0.815)
Math Low 25%	0.807 (0.255)	0.796 (0.154)	0.805 (0.323)	0.807 (0.192)	0.035*** (0.000)	0.064*** (0.000)	0.024*** (0.000)	0.071*** (0.000)
GHA Status	2.774*** (0.000)	3.288*** (0.000)	2.724*** (0.000)	2.946*** (0.000)	1.839** (0.019)	1.050 (0.779)	1.581 (0.108)	0.897 (0.503)
FY18 Scale Score	1.103*** (0.000)	0.967*** (0.000)	1.109*** (0.000)	0.973*** (0.000)	1.106*** (0.000)	0.964*** (0.000)	1.117*** (0.000)	0.981*** (0.000)
N	1603	1600	1533	1533	1603	1603	1533	1533

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

ESE Status

The relationship between student achievement and classroom structure for ESE students is complex. ELA scores for fourth-grade students are more negative under departmentalization than their non-ESE peers. The fourth-grade results are displayed in Tables 33 and 34.

Table 33***Relationship between classroom structure and academic achievement by ESE status – 4th Grade – scale score***

	ELA ESE	ELA Non-ESE	Math ESE	Math Non-ESE
	SS	SS	SS	SS
Classroom Structure	-3.495*** (0.947)	-1.471*** (0.377)	-1.888* (1.001)	-1.193*** (0.432)
Sex	-3.606*** (0.937)	-1.163*** (0.370)	-1.766* (1.007)	1.392*** (0.425)
White	-5.775* (3.291)	-0.915 (0.946)	4.447 (3.523)	-0.736 (1.083)
Black	-10.509*** (3.460)	-1.924* (1.081)	3.711 (3.726)	-3.310*** (1.242)
Hispanic	-7.279** (3.257)	-1.219 (0.951)	2.668 (3.498)	-1.768 (1.090)
ELL	-1.326 (1.035)	-1.494*** (0.453)	-0.073 (1.102)	-1.743*** (0.512)
SES	-4.088*** (1.321)	-4.296*** (0.480)	-3.098** (1.414)	-3.680*** (0.547)
ELA Low 25%	-15.387*** (1.091)	-13.616*** (0.533)	-1.216 (1.106)	-1.825*** (0.586)
Math Low 25%	-1.938* (1.029)	-2.901*** (0.495)	-15.364*** (1.218)	-14.234*** (0.606)
GHA Status	2.476 (16.44)	4.340*** (0.481)	5.613*** (1.700)	4.622*** (0.544)
FY18 Scale Score	0.388*** (0.033)	0.488*** (0.015)	0.555*** (0.034)	0.612*** (0.017)
N	498	2459	498	2459
R Squared	0.704	0.748	0.739	0.758

Note: standard errors in parentheses.

Table 34***Relationship between classroom structure and academic achievement by ESE status – 4th Grade – proficiency and gains***

	ELA ESE		ELA Non-ESE		Math ESE		Math Non-ESE	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.383*** (0.003)	0.614** (0.039)	0.636*** (0.002)	0.800** (0.030)	0.720 (0.302)	0.575** (0.025)	0.688** (0.016)	0.672*** (0.001)
Sex	0.561* (0.075)	0.503*** (0.003)	0.783* (0.703)	0.738*** (0.002)	0.739 (0.324)	0.572** (0.023)	1.183 (0.255)	1.203 (0.108)
White	3.998 (0.233)	0.628 (0.535)	1.415 (0.415)	0.795 (0.404)	3.850 (0.377)	3.480 (0.176)	1.307 (0.574)	1.097 (0.780)
Black	1.264 (0.851)	0.213* (0.061)	0.876 (0.769)	0.470** (0.013)	1.239 (0.893)	3.178 (0.228)	0.780 (0.618)	0.614 (0.171)
Hispanic	3.876 (0.244)	0.697 (0.628)	1.003 (0.995)	0.643 (0.106)	1.808 (0.608)	1.602 (0.604)	0.802 (0.633)	0.847 (0.612)
ELL	0.430** (0.023)	0.799 (0.397)	0.649*** (0.004)	0.672*** (0.001)	0.921 (0.804)	1.040 (0.881)	0.683** (0.019)	0.722** (0.012)

Table 34 - continued

	ELA ESE		ELA Non-ESE		Math ESE		Math Non-ESE	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
SES	0.269*** (0.003)	0.478** (0.019)	0.266*** (0.000)	0.485*** (0.000)	0.502 (0.127)	0.586 (0.118)	0.325*** (0.000)	0.439*** (0.000)
ELA Low 25%	0.067*** (0.000)	0.092*** (0.000)	0.041** (0.000)	0.067*** (0.000)	0.980 (0.949)	0.730 (0.230)	0.787 (0.160)	0.673*** (0.005)
Math Low 25%	0.700 (0.301)	0.639* (0.087)	0.606*** (0.002)	0.617*** (0.000)	0.079*** (0.000)	0.045*** (0.000)	0.085*** (0.000)	0.071*** (0.000)
GHA Status	2.323* (0.091)	1.781 (0.130)	2.620*** (0.000)	2.315*** (0.000)	6.976** (0.034)	2.440 (0.068)	2.229*** (0.000)	2.190*** (0.000)
FY18 Scale Score	1.0367*** (0.000)	0.961*** (0.000)	1.089*** (0.000)	0.966*** (0.000)	1.106*** (0.000)	0.977*** (0.003)	1.116*** (0.000)	0.990** (0.045)
N	494	494	2457	2457	496	496	2452	2452

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

Fourth grade departmentalized ESE students had, on average, lower scale scores and a higher likelihood of not making gains as compared to their peers. ELA scores for departmentalized ESE students showed a significant negative impact in all three areas of achievement. Scale scores for ESE students are an average of 2.024 points lower than their non-ESE peers, the likelihood of being proficient is 0.383 times less, and the likelihood of making gains is 0.614 times less.

The fifth-grade relationship between ESE status, classroom structure, and student achievement is different than fourth-grade. The fifth-grade results are displayed in Tables 35 and 36. None of the results are significant when comparing the student achievement for ESE to non-ESE students.

Table 35

Relationship between classroom structure and academic achievement by ESE status – 5th Grade – scale score

	ELA ESE	ELA Non-ESE	Math ESE	Math Non-ESE
	SS	SS	SS	SS
Classroom Structure	-0.057 (0.966)	-0.139 (0.484)	0.716 (1.294)	0.016 (0.526)
Sex	-2.209** (0.036)	-2.12*** (0.381)	-2.307** (1.022)	-0.056 (0.418)
White	1.450 (0.822)	-0.663 (1.493)	-0.842 (6.263)	-.450** (1.624)

Table 35 - continued

	ELA ESE	ELA Non-ESE	Math ESE	Math Non-ESE
	SS	SS	SS	SS
Black	1.634 (0.804)	-2.756* (1.609)	-2.803 (6.396)	-4.730*** (1.753)
Hispanic	0.142 (0.982)	-2.396 (1.505)	-1.323 (6.251)	-4.032** (1.636)
ELL	-3.290*** (0.008)	-2.163*** (0.487)	-0.801 (1.200)	-0.100 (0.526)
SES	-3.346** (0.032)	-3.515*** (0.524)	-0.005 (1.506)	-2.476*** (0.570)
ELA Low 25%	-17.332*** (0.000)	-13.112*** (0.566)	-3.084*** (1.173)	-1.954*** (0.584)
Math Low 25%	-1.944* (0.098)	-1.535*** (0.529)	-14.661*** (1.324)	-15.112*** (0.612)
GHA Status	4.976** (0.010)	3.480*** (0.497)	0.450 (1.831)	0.177 (0.551)
FY18 Scale Score	-.493*** (0.000)	0.633*** (0.016)	-3.084 (0.033)	0.623*** (0.015)
N	461	2675	461	2675
R Squared	0.699	0.770	0.755	0.751

Note: standard errors in parentheses

Table 36

Relationship between classroom structure and academic achievement by ESE status – 5th Grade – proficiency and gains

	ELA ESE		ELA Non-ESE		Math ESE		Math Non-ESE	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.668 (0.344)	1.523 (0.177)	0.847 (0.357)	0.872 (0.283)	1.133 (0.765)	1.039 (0.896)	0.957 (0.834)	0.984 (0.890)
Sex	0.838 (0.612)	0.397 (0.785)	0.708*** (0.009)	0.669*** (0.000)	0.797 (0.526)	0.581** (0.017)	0.739* (0.054)	0.802** (0.019)
White	2.283 (0.685)	3.215 (0.407)	0.376 (0.229)	1.137 (0.752)	0.000 (0.999)	1.963 (0.597)	0.425 (0.520)	0.621 (0.232)
Black	1.879 (0.760)	2.344 (0.552)	0.226* (0.0473)	0.761 (0.522)	0.000 (0.999)	1.784 (0.657)	0.209 (0.243)	0.500 (0.103)
Hispanic	2.388 (0.667)	2.053 (0.607)	0.174** (0.031)	0.700 (0.377)	0.000 (0.999)	2.015 (0.582)	0.258 (0.306)	0.557 (0.144)
ELL	0.416** (0.033)	0.550** (0.040)	0.636*** (0.002)	0.629*** (0.000)	1.609 (0.261)	0.771 (0.313)	1.376* (0.074)	1.059 (0.628)
SES	0.416* (0.092)	0.439** (0.019)	0.464*** (0.000)	0.520*** (0.000)	0.734 (0.576)	0.636 (0.173)	0.429*** (0.000)	0.756** (0.029)
ELA Low 25%	0.039*** (0.000)	0.058*** (0.000)	0.080*** (0.000)	0.107*** (0.000)	1.348 (0.424)	0.863 (0.565)	1.353 (0.104)	0.868 (0.275)
Math Low 25%	0.980 (0.955)	0.780 (0.349)	0.782 (0.117)	0.790* (0.064)	0.021*** (0.000)	0.069*** (0.000)	0.031*** (0.000)	0.069*** (0.000)
GHA Status	3.906** (0.022)	9.741*** (0.000)	2.580*** (0.000)	2.802*** (0.000)	3.605* (0.081)	1.613 (0.260)	1.511** (0.039)	0.890 (0.361)
FY18 Scale Score	1.091*** (0.000)	0.950*** (0.000)	1.109*** (0.000)	0.974*** (0.000)	1.087*** (0.000)	0.965*** (0.000)	1.117*** (0.000)	0.975*** (0.000)
N	461	460	2675	2673	461	461	2675	2675

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

ELL Status

The relationship between student achievement and classroom structure is varied for ELL students. The scale scores for fourth-grade ELL students in a departmentalized structure are higher than their non-ELL peers in a departmentalized structure for both ELA and Math, yet for fifth-grade, Math is lower and ELA is higher. For fourth-grade math, ELL students have a less negative relationship between departmentalization and student achievement than their non-ELL peers, as demonstrated in Tables 37 and 38.

Table 37

Relationship between classroom structure and academic achievement by ELL status – 4th Grade – scale score

	ELA ELL SS	ELA Non-ELL SS	Math ELL SS	Math Non-ELL SS
Classroom Structure	-1.542*** (0.586)	-1.840*** (0.440)	-1.317** (0.634)	-1.328*** (0.507)
Sex	-0.818 (0.565)	-2.053*** (0.435)	1.248** (0.614)	0.748 (0.503)
White	-0.204 (2.580)	-1.558 (1.010)	-3.268 (2.787)	-0.277 (1.167)
Black	-3.591 (2.236)	-.449** (1.196)	-4.636* (2.425)	-2.492* (1.383)
Hispanic	-1.422 (2.081)	-1.977* (1.036)	-4.525** (2.250)	-0.794 (1.197)
ESE	-1.806** (0.770)	-1.773*** (0.645)	2.113** (0.822)	0.547 (0.741)
SES	-3.961*** (1.093)	-4.226*** (0.505)	-5.619*** (1.178)	-3.128*** (0.581)
ELA Low 25%	-14.335*** (0.736)	-13.804*** (0.629)	-2.358*** (0.749)	-1.403** (0.698)
Math Low 25%	-3.171*** (0.682)	-2.026*** (0.586)	-14.741*** (0.807)	-14.288*** (0.722)
GHA Status	5.611*** (0.767)	3.989*** (0.575)	4.883*** (0.811)	4.765*** (0.655)
FY18 Scale Score	0.393*** (0.024)	0.501*** (0.017)	0.545*** (0.025)	0.625*** (0.019)

Table 37 - continued

	ELA ELL	ELA Non-ELL	Math ELL	Math Non-ELL
	SS	SS	SS	SS
N	1048	1909	1048	1909
R Squared	0.713	0.764	0.741	0.756

Note: standard errors in parentheses

Table 38

Relationship between classroom structure and academic achievement by ELL status – 4th Grade – proficiency and gains

	ELA ELL		ELA Non-ELL		Math ELL		Math Non-ELL	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.715* (0.082)	0.969 (0.841)	0.486*** (0.000)	0.675*** (0.001)	0.822 (0.363)	0.769 (0.133)	0.601*** (0.006)	0.593*** (0.000)
Sex	0.968 (0.860)	0.943 (0.699)	0.608*** (0.003)	0.583*** (0.000)	0.979 (0.916)	0.964 (0.825)	1.158 (0.403)	1.107 (0.443)
White	2.148 (0.434)	1.794 (0.419)	1.553 (0.306)	0.682 (0.176)	0.707 (0.831)	0.725 (0.761)	1.733 (0.228)	1.495 (0.209)
Black	0.844 (0.843)	0.636 (0.452)	1.061 (0.901)	0.385*** (0.003)	0.102 (0.133)	0.197* (0.083)	1.168 (0.753)	0.985 (0.967)
Hispanic	1.506 (0.614)	1.112 (0.849)	1.133 (0.771)	0.567** (0.049)	0.146 (0.196)	0.238 (0.112)	1.113 (0.813)	1.057 (0.862)
ESE	0.708 (0.223)	0.906 (0.649)	1.033 (0.886)	0.493*** (0.000)	1.444 (0.176)	1.806*** (0.008)	0.924 (0.720)	0.992 (0.965)
SES	0.139*** (0.000)	0.298*** (0.000)	0.322*** (0.000)	0.519*** (0.000)	0.210** (0.001)	0.308*** (0.001)	0.408*** (0.000)	0.494*** (0.000)
ELA Low 25%	0.041*** (0.000)	0.067*** (0.000)	0.048*** (0.000)	0.076*** (0.000)	0.617** (0.042)	0.753 (0.148)	1.031 (0.878)	0.621*** (0.000)
Math Low 25%	0.444*** (0.000)	0.568*** (0.002)	0.809 (0.271)	0.686** (0.012)	0.043*** (0.000)	0.049*** (0.000)	0.112*** (0.000)	0.078*** (0.000)
GHA Status	2.660*** (0.000)	3.083*** (0.000)	2.668*** (0.000)	2.086*** (0.000)	2.638*** (0.001)	3.554*** (0.000)	2.476*** (0.000)	1.888*** (0.000)
FY18 Scale Score	1.081*** (0.000)	0.969*** (0.000)	1.090*** (0.000)	0.963*** (0.000)	1.104*** (0.000)	0.986** (0.043)	1.120*** (0.000)	0.987*** (0.008)
N	1045	1045	1906	1906	1044	1044	1904	1904

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

The math scale score for ELL students in a departmentalized classroom is, on average, 1.317 points lower than their self-contained peers; this is slightly less than the 1.328 points lower the non-ELL students in a departmentalized classroom. This pattern is matched for proficiency and gains. ELA scale scores have a more negative relationship with Non-ELL students, yet a less negative relationship for proficiency and gains. However, the relationship between classroom structure and student achievement is still negative across the board. This is different than the

relationship in fifth grade, shown in Tables 39 and 40. For fifth-grade ELL students, none of the results are significant.

Table 39

Relationship between classroom structure and academic achievement by ELL status - 5th Grade – scale score

	ELA ELL	ELA Non-ELL	Math ELL	Math Non-ELL
	SS	SS	SS	SS
Classroom Structure	-0.163 (0.969)	-0.146 (0.517)	1.415 (1.006)	-0.251 (0.553)
Sex	-2.491*** (0.684)	-1.987*** (0.424)	-1.674** (0.714)	0.102 (0.456)
White	3.478 (3.696)	-1.240 (1.675)	-1.549 (3.838)	-3.993** (1.793)
Black	-0.870 (3.156)	-3.071* (1.820)	-3.236 (3.280)	-5.515*** (1.953)
Hispanic	-0.968 (3.015)	-2.969* (1.704)	-2.914 (3.130)	-4.208** (1.826)
ESE	-1.473 (1.000)	0.145 (0.666)	-0.236 (1.037)	1.1993* (0.707)
SES	-5.137*** (1.436)	-3.124*** (0.536)	0.879 (1.495)	-2.301*** (0.574)
ELA Low 25%	-14.014*** (0.861)	-14.078*** (0.640)	-1.386* (0.836)	-2.579*** (0.654)
Math Low 25%	-1.084 (0.816)	-1.809*** (0.592)	-15.805*** (0.931)	-14.707*** (.21.674)
GHA Status	3.156*** (0.920)	3.886*** (0.570)	-0.407 (0.977)	0.402 (0.615)
FY18 Scale Score	0.560*** (0.028)	0.625*** (0.017)	0.549*** (0.025)	0.642*** (0.016)
N	851	2285	851	2285
R Squared	0.718	0.776	0.741	0.765

Note: standard errors in parentheses.

Table 40

Relationship between classroom structure and academic achievement by ELL status - 5th Grade – proficiency and gains

	ELA ELL		ELA Non-ELL		Math ELL		Math Non-ELL	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.896 (0.701)	0.875 (0.545)	0.784 (0.234)	0.983 (0.903)	0.931 (0.832)	1.025 (0.-917)	1.036 (0.872)	0.994 (0.960)
Sex	0.831 (0.339)	0.684** (0.015)	0.674** (0.014)	0.709*** (0.002)	0.771 (0.280)	0.579*** (0.002)	0.756 (0.118)	0.845* (0.095)

Table 40 - continued

	ELA ELL		ELA Non-ELL		Math ELL		Math Non-ELL	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
White	2.073 (0.510)	2.659 (0.254)	0.148 (0.143)	1.176 (0.730)	1.064 (0.971)	0.679 (0.663)	0.041 (0.498)	0.611 (0.266)
Black	0.373 (0.281)	0.935 (0.924)	0.111* (0.097)	0.758 (0.580)	0.363 (0.506)	0.626 (0.541)	0.008 (0.449)	0.503 (0.147)
Hispanic	0.352 (0.232)	0.756 (0.676)	0.081* (0.055)	0.755 (0.553)	0.573 (0.708)	0.651 (0.556)	0.009 (0.453)	0.597 (0.250)
ESE	1.116 (0.740)	0.993 (0.978)	1.745** (0.014)	1.237 (0.197)	1.165 (0.672)	0.743 (0.215)	0.881 (0.591)	1.382** (0.041)
SES	0.582 (0.198)	0.391*** (0.007)	0.445*** (0.000)	0.518*** (0.000)	0.663 (0.497)	1.249 (0.507)	0.434*** (0.001)	0.719** (0.010)
ELA Low 25%	0.087*** (0.000)	0.126*** (0.000)	0.065*** (0.000)	0.081*** (0.000)	1.285 (0.355)	1.056 (0.786)	1.378 (0.127)	0.777* (0.076)
Math Low 25%	0.749 (0.211)	0.814 (0.273)	0.835 (0.320)	0.803 (0.127)	0.033*** (0.000)	0.045*** (0.000)	0.028*** (0.000)	0.079*** (0.000)
GHA Status	1.728** (0.022)	2.614*** (0.000)	3.665*** (0.000)	3.321*** (0.000)	1.843 (0.105)	0.789 (0.304)	1.550* (0.052)	0.994 (0.963)
FY18 Scale Score	1.091*** (0.000)	0.971*** (0.000)	1.115*** (0.000)	0.970*** (0.000)	1.095*** (0.000)	0.961*** (0.000)	1.123*** (0.000)	0.978*** (0.000)
N	851	850	2285	2283	851	851	2285	2285

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

Socio-Economic Status

Students from a low-SES background in fourth grade have lower scale scores on the ELA FSA than their peers from higher-SES backgrounds in departmentalized classrooms. On average, ELA scale scores are 2.132 points lower for low SES students than their low SES self-contained peers as compared to only 1.027 points lower for higher SES students in departmentalized classrooms compared to higher SES students in self-contained classrooms, as shown in Tables 41 and 42.

Table 41

Relationship between classroom structure and academic achievement by SES – 4th Grade – scale score

	ELA High SES	ELA Low SES	Math High SES	Math Low SES
	SS	SS	SS	SS
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)

Table 41 - continued

	ELA High SES	ELA Low SES	Math High SES	Math Low SES
	SS	SS	SS	SS
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: standard errors in parentheses.

Table 42

Relationship between classroom structure and academic achievement by SES – 4th Grade – 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** (0.021)	0.749* (0.089)	0.595*** (0.000)	0.778** (0.027)	0.611 (0.102)	0.537*** (0.003)	0.732** (0.047)	0.684*** (0.002)
Sex	0.618* (0.086)	0.644*** (0.009)	0.782* (0.078)	0.716*** (0.002)	0.815 (0.496)	1.057 (0.794)	1.164 (0.306)	1.045 (0.709)
White	2.390 (0.109)	0.838 (0.580)	1.195 (0.753)	0.680 (0.358)	1.205 (0.790)	1.209 (0.651)	1.833 (0.297)	1.384 (0.458)
Black	0.749 (0.744)	0.649 (0.433)	0.748 (0.602)	0.317*** (0.006)	1.921 (0.526)	0.855 (0.809)	0.934 (0.904)	0.952 (0.910)
Hispanic	1.417 (.0539)	0.792 (0.500)	0.948 (0.920)	0.487* (0.070)	0.443 (0.257)	0.530 (0.147)	1.149 (0.800)	1.092 (0.831)
ESE	1.081 (0.840)	0.380*** (0.000)	0.818 (0.313)	0.750* (0.064)	0.765 (0.482)	0.688 (0.186)	1.220 (0.302)	1.498** (0.010)
ELL	1.092 (0.846)	0.775 (0.434)	0.567*** (0.000)	0.724*** (0.006)	1.313 (0.551)	1.224 (0.577)	0.677** (0.013)	0.740** (0.017)
ELA Low 25%	0.033*** (0.000)	0.069*** (0.000)	0.051*** (0.000)	0.069*** (0.000)	0.776 (0.425)	0.776 (0.350)	0.829 (0.271)	0.638*** (0.001)
Math Low 25%	1.424 (0.280)	0.187 (0.726)	0.505*** (0.000)	0.593*** (0.000)	0.081*** (0.000)	0.074*** (0.000)	0.081*** (0.000)	0.062*** (0.000)
GHA Status	2.565*** (0.010)	1.413 (0.125)	2.691*** (0.000)	2.833*** (0.000)	2.117* (0.082)	1.738* (0.051)	2.494*** (0.000)	2.638*** (0.000)
FY18 Scale Score	1.017*** (0.000)	0.956*** (0.000)	1.088*** (0.000)	0.968*** (0.000)	1.099*** (0.000)	0.978** (0.006)	1.116*** (0.000)	0.989** (0.019)
N	908	908	2043	2043	909	909	2039	2039

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

When looking at both proficiency and gains for fourth-grade ELA the relationship varies slightly. Low-SES students have 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.

For fourth-grade math scale score, the opposite relationship that ELA achievement has is true - High-SES students score 1.959 points lower as compared to their Low-SES peers, with Low-SES peers scoring on average 1.114 points lower. 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 than for ELA. For proficiency, high-SES students are 0.611 times less likely to be proficient than their high-SES peers in self-contained classrooms as compared to low-SES students being 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 chance to make gains when departmentalized as compared to low-SES students who are 0.684 times less likely to make gains when departmentalized.

The relationship between student achievement and classroom structure for fifth-grade students from Low SES backgrounds varies from the relationship in fourth-grade. Tables 43 and 44 showcase the fifth-grade results. None of the results for fifth grade SES are significant.

Table 43***Relationship between classroom structure and academic achievement by SES – 5th Grade – scale score***

	ELA High SES	ELA Low SES	Math High SES	Math Low SES
	SS	SS	SS	SS
Classroom Structure	-0.564 (0.732)	0.329 (0.588)	-0.259 (0.816)	0.505 (0.611)
Sex	-2.310*** (0.653)	-1.988*** (0.31)	0.945 (0.732)	-0.878* (0.452)
White	0.222 (1.825)	-1.539 (2.544)	-2.837 (2.038)	-4.023 (2.650)
Black	1.579 (2.983)	-4.038 (2.543)	-2.847 (3.314)	-5.175* (2.650)
Hispanic	-0.883 (1.919)	-3.891 (2.487)	-3.777* (2.144)	-4.053 (2.591)
ESE	-1.309 (1.229)	-0.417 (0.617)	-1.471 (1.365)	0.947 (0.637)
ELL	-1.579 (1.528)	-2.450*** (0.476)	-4.478*** (1.698)	0.034* (0.492)
ELA Low 25%	-13.981*** (11.097)	-14.000*** (0.579)	-4.478*** (1.173)	-1.702*** (0.570)
Math Low 25%	-3.603*** (1.039)	-0.889* (0.540)	-15.302*** (1.209)	-14.889*** (0.615)
GHA Status	1.496 (0.922)	4.637*** (0.569)	-1.023 (1.035)	0.794 (0.602)
FY18 Scale Score	0.644*** (0.27)	0.590*** (0.018)	0.644*** (0.026)	0.602*** (0.016)
N	975	2161	975	2161
R Squared	0.715	0.759	0.691	0.762

Note: standard errors in parentheses.

Table 44***Relationship between classroom structure and academic achievement by SES – 5th Grade – 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	0.932 (0.820)	0.875 (0.537)	0.807 (0.256)	1.032 (0.824)	1.007 (0.985)	0.921 (0.647)	0.989 (0.958)	1.065 (0.651)
Sex	0.543* (0.065)	0.603*** (0.008)	0.771* (0.050)	0.735*** (0.003)	0.630 (0.176)	0.816 (0.196)	0.781 (0.120)	0.761*** (0.008)
White	0.380 (0.385)	1.433 (0.462)	0.528 (0.520)	0.968 (0.959)	0.000 (0.998)	0.984 (0.971)	0.654 (0.775)	0.262* (0.093)
Black	0.341 (0.543)	1.757 (0.566)	0.367 (0.309)	0.636 (0.475)	0.000 (0.997)	1.215 (0.804)	0.367 (0.499)	0.237* (0.072)
Hispanic	0.120* (0.061)	0.846 (0.744)	0.309 (0.227)	0.588 (0.392)	0.000 (0.998)	0.753 (0.539)	0.425 (0.561)	0.285 (0.111)
ESE	1.389 (0.518)	0.990 (0.976)	1.446* (0.062)	1.148 (0.345)	0.473 (0.135)	1.465 (0.206)	1.063 (0.774)	1.021 (0.888)

Table 44 - continued

	ELA High SES		ELA Low SES		Math High SES		Math Low SES	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
ELL	0.550 (0.276)	0.797 (0.575)	0.612*** (0.000)	0.610*** (0.000)	0.858 (0.824)	0.614 (0.161)	1.431** (0.034)	1.007 (0.953)
ELA Low 25%	0.040*** (0.000)	0.065*** (0.000)	0.088*** (0.000)	0.106*** (0.000)	1.215 (0.615)	0.567** (0.019)	1.394* (0.071)	0.980 (0.878)
Math Low 25%	0.475** (0.036)	0.590** (0.046)	0.896 (0.484)	0.874 (0.284)	0.028*** (0.000)	0.085*** (0.000)	0.030*** (0.000)	0.065*** (0.000)
GHA Status	3.340*** (0.001)	2.522*** (0.000)	2.582*** (0.000)	3.306*** (0.000)	2.044 (0.067)	0.780 (0.292)	1.529* (0.054)	1.027 (0.847)
FY18 Scale Score	1.105*** (0.000)	0.958*** (0.000)	1.106*** (0.000)	0.974*** (0.000)	1.114*** (0.000)	0.981*** (0.001)	1.112*** (0.000)	0.970*** (0.000)
N	975	974	2161	2159	975	975	2161	2161

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

Gifted and High Achieving Status

For both fourth and fifth-grade, there are aspects of comparing student achievement to classroom structure by GHA status that are not significant. The regression results for fourth-grade students are displayed in Tables 45 and 46.

Table 45

Relationship between classroom structure and academic achievement by GHA status – 4th Grade – scale score

	ELA GHA	ELA Non-GHA	Math GHA	Math Non-GHA
	SS	SS	SS	SS
Classroom Structure	-0.805 (0.537)	-2.773*** (0.457)	-0.797 (0.634)	-1.889*** (0.500)
Sex	-1.170** (0.531)	-1.988*** (0.443)	1.810*** (0.629)	0.236 (0.488)
White	-2.042* (1.193)	0.952 (1.427)	0.174 (1.412)	-0.469 (1.568)
Black	-3.615** (1.506)	-1.236 (1.501)	-3.926** (1.785)	-1.41 (1.652)
Hispanic	-2.306* (1.215)	-0.261 (1.403)	-1.580 (1.440)	-1.321 (1.541)
ESE	-4.427*** (1.263)	-1.936*** (0.526)	-0.063 (1.494)	1.066* (0.571)
ELL	-0.940 (0.721)	-1.581*** (0.497)	-2.239*** (0.836)	-0.874 (0.542)
SES	-3.556*** (0.656)	-5.017*** (0.619)	-2.499*** (0.773)	-4.612*** (0.676)
ELA Low 25%	-16.762*** (1.103)	-14.010*** (0.521)	-4.627*** (1.281)	-1.181** (0.538)

Table 45 - continued

	ELA GHA	ELA Non-GHA	Math GHA	Math Non-GHA
	SS	SS	SS	SS
Math Low 25%	-6.141*** (1.044)	-2.092*** (0.478)	-18.863*** (1.268)	-13.696*** (0.589)
FY18 Scale Score	0.558*** (0.021)	0.390*** (0.018)	0.626*** (0.023)	0.570*** (0.020)
N	1278	1678	1278	1678
R Squared	0.586	0.679	0.581	0.686

Note: standard errors in parentheses.

Table 46

Relationship between classroom structure and academic achievement by GHA status – 4th Grade – proficiency and gains

	ELA GHA		ELA Non-GHA		Math GHA		Math Non-GHA	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.635 (0.107)	0.942 (0.679)	0.555*** (0.000)	0.659*** (0.001)	1.274 (0.481)	0.789 (0.234)	0.630*** (0.002)	0.613*** (0.000)
Sex	0.908 (0.722)	0.823 (0.172)	0.720** (0.019)	0.605*** (0.000)	1.010 (0.976)	1.287 (0.198)	1.082 (0.584)	0.963 (0.756)
White	0.205 (0.221)	0.406** (0.019)	2.518** (0.045)	1.747 (0.159)	1.041 (0.973)	1.078 (0.870)	1.548 (0.360)	1.311 (0.512)
Black	0.607** (0.048)	0.256*** (0.002)	1.578 (0.350)	0.748 (0.487)	0.533 (0.611)	0.498 (0.183)	0.811 (0.675)	0.842 (0.687)
Hispanic	0.109* (0.092)	0.400** (0.019)	1.957 (0.138)	1.155 (0.711)	0.690 (0.750)	0.865 (0.809)	0.871 (0.768)	0.778 (0.532)
ESE	0.547 (0.238)	0.352*** (0.000)	0.875 (0.466)	0.663*** (0.006)	3.831 (0.201)	0.852 (0.722)	1.062 (0.727)	1.295* (0.070)
ELL	0.595* (0.092)	0.783 (0.202)	0.632*** (0.004)	0.681*** (0.005)	0.628 (0.227)	0.944 (0.817)	0.763* (0.087)	0.775* (0.056)
SES	0.298*** (0.005)	0.703** (0.046)	0.255*** (0.000)	0.319*** (0.000)	0.288** (0.011)	0.504*** (0.005)	0.367*** (0.000)	0.861*** (0.000)
ELA Low 25%	0.016*** (0.000)	0.066*** (0.000)	0.068*** (0.000)	0.065*** (0.000)	0.498 (0.170)	0.390*** (0.004)	0.861 (0.332)	0.743** (0.025)
Math Low 25%	0.248*** (0.000)	0.258*** (0.000)	0.695*** (0.007)	0.755** (0.032)	0.039*** (0.000)	0.031*** (0.000)	0.098*** (0.000)	0.080*** (0.000)
FY18 Scale Score	1.113*** (0.000)	0.966*** (0.000)	1.077*** (0.000)	0.961*** (0.000)	1.126*** (0.000)	0.972*** (0.000)	1.112*** (0.000)	0.9994 (0.217)
N	1277	1277	1674	1674	1277	1277	1671	1671

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

As demonstrated in the overall relationship between student achievement and classroom structure, even fourth-grade gifted and high achieving students demonstrate a negative relationship between student achievement and classroom structure, as demonstrated in all measures of student achievement in ELA and both scale score and gains for math. Only math

proficiency has a positive relationship with GHA students in departmentalized classes have a likelihood of being proficient 0.242 times higher than their peers in self-contained classes. Although the relationship is still negative, students in the GHA cohort in fourth-grade still demonstrated a more positive relationship between student achievement and the departmentalized classroom structure in all measures of student achievement, Math and ELA.

The pattern of GHA students in departmentalized classes having a more positive student achievement outcome is mirrored in the fifth-grade ELA data. That data is shared in its entirety in Tables 47 and 48. Fifth grade departmentalized students in the GHA cohort are 0.253 times as likely to be proficient in math as their peers in a self-contained class. None of the other fifth grade GHA cohort results are significant.

Table 47

Relationship between classroom structure and academic achievement by GHA status – 5th Grade – scale score

	ELA GHA SS	ELA Non-GHA SS	Math GHA SS	Math Non-GHA SS
Classroom Structure	0.475 (0.638)	-0.870 (0.657)	-0.360 (0.691)	0.392 (0.690)
Sex	-2.371*** (0.520)	-1.858*** (0.495)	0.878 (0.566)	-1.495*** (0.525)
White	-0.56 (1.710)	-2.672 (2.904)	-3.461* (1.851)	-3.414 (3.062)
Black	-0.778 (1.996)	-6.027** (2.952)	-5.375** (2.167)	-4.897 (3.116)
Hispanic	-0.910 (1.731)	-6.093** (2.891)	-3.589* (1.874)	-4.503 (3.049)
ESE	0.101 (1.374)	-1.049* (0.609)	-0.751 (1.485)	0.686 (0.635)
ELL	-3.902*** (0.804)	-1.566*** (0.547)	-2.462*** (0.863)	0.823 (0.575)
SES	-3.042*** (0.646)	-3.956*** (0.788)	-2.031*** (0.697)	-2.124** (0.834)
ELA Low 25%	-13.792*** (1.058)	-14.473*** (0.591)	-4.275*** (1.109)	-1.520*** (0.582)
Math Low 25%	-2.528** (1.008)	-1.393** (0.543)	-14.338*** (1.137)	-15.624*** (0.637)

Table 47 - continued

	ELA GHA	ELA Non-GHA	Math GHA	Math Non-GHA
	SS	SS	SS	SS
FY18 Scale Score	0.673*** (0.022)	0.543*** (0.020)	0.642*** (0.020)	0.585*** (0.019)
N	1493	1643	1493	1643
R Squared	0.600	0.693	0.596	0.708

Note: standard errors in parentheses.

Table 48

Relationship between classroom structure and academic achievement by GHA status – 5th Grade – proficiency and gains

	ELA GHA		ELA Non-GHA		Math GHA		Math Non-GHA	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	1.048 (0.882)	1.010 (0.956)	0.751 (0.137)	0.896 (0.468)	0.253*** (0.002)	0.791 (0.135)	1.392 (0.123)	1.177 (0.308)
Sex	0.657* (0.088)	0.640*** (0.003)	0.752** (0.045)	0.734*** (0.006)	0.588* (0.092)	0.894 (0.367)	0.803 (0.176)	0.649*** (0.000)
White	0.385 (0.420)	1.362 (0.510)	0.384 (0.333)	0.700 (0.622)	1.832 (0.714)	0.781 (0.567)	0.019 (0.404)	0.472 (0.304)
Black	0.224 (0.229)	0.927 (0.889)	0.256 (0.171)	0.441 (0.263)	0.357 (0.537)	0.394* (0.056)	0.012 (0.353)	0.472 (0.387)
Hispanic	0.200 (0.170)	0.968 (0.944)	0.202 (0.103)	0.385 (0.184)	0.886 (0.941)	0.341 (0.306)	0.012 (0.355)	0.451 (0.352)
ESE	1.891 (0.261)	2.856** (0.045)	1.351 (0.122)	0.994 (0.184)	1.523 (0.566)	1.481 (0.267)	0.929 (0.716)	1.008 (0.954)
ELL	0.302*** (0.000)	0.440*** (0.000)	0.752* (0.068)	0.698*** (0.004)	1.678 (0.235)	0.768 (0.145)	1.355* (0.085)	1.118 (0.405)
SES	0.397** (0.010)	0.560*** (0.002)	0.502*** (0.003)	0.454*** (0.000)	0.343** (0.013)	0.873 (0.373)	0.516** (0.012)	0.615** (0.013)
ELA Low 25%	0.052*** (0.000)	0.060*** (0.000)	0.058*** (0.000)	0.111*** (0.000)	0.989 (0.979)	0.444*** (0.000)	1.362* (0.085)	1.085 (0.549)
Math Low 25%	0.790 (0.491)	0.605* (0.060)	0.809 (0.173)	0.842 (0.169)	0.019*** (0.000)	0.085*** (0.000)	0.032*** (0.000)	0.055*** (0.000)
FY18 Scale Score	1.118*** (0.000)	0.967*** (0.000)	1.100*** (0.000)	0.970*** (0.000)	1.138*** (0.000)	0.980*** (0.000)	1.108*** (0.000)	0.966*** (0.000)
N	1493	1493	1643	1640	1493	1493	1643	1643

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

ELA Lowest 25%

Fourth-grade students who are in the Lowest 25% for ELA have a negative relationship between departmentalization and student achievement for both ELA and math. The fourth-grade results are displayed in Tables 49 and 50.

Table 49***Relationship between classroom structure and academic achievement by prior academic performance in ELA (ELA Lowest 25%) – 4th Grade – scale score***

	ELA Low 25	ELA Non-Low 25	Math Low 25	Math Non-Low 25
	SS	SS	SS	SS
Classroom Structure	-2.785*** (0.708)	-1.319*** (0.398)	-2.595*** (0.769)	-0.780* (0.461)
Sex	-2.285*** (0.709)	-1.301*** (0.388)	-0.311 (0.771)	1.385*** (0.451)
White	-0.420 (2.118)	-1.174 (0.995)	1.245 (2.303)	-0.489 (1.152)
Black	-4.410** (2.230)	-1.847 (1.159)	0.003 (2.429)	-3.424** (1.348)
Hispanic	-3.297 (2.083)	-1.007 (1.003)	-0.575 (2.269)	-1.661 (1.161)
ESE	-2.339*** (0.758)	-1.612** (0.679)	0.820 (0.816)	1.023 (0.781)
ELL	-1.055 (0.785)	-1.608*** (0.485)	-1.335 (0.846)	-1.423*** (0.555)
SES	-4.955*** (0.969)	-4.049*** (0.504)	-4.217*** (1.052)	-3.431*** (0.581)
GHA	-0.168 (1.248)	4.632*** (0.493)	1.064 (1.331)	5.080*** (0.561)
Math Low 25%	-1.174 (0.731)	-3.968*** (0.566)	-14.749*** (0.890)	-14.762*** (0.695)
FY18 Scale Score	0.406*** (0.027)	0.493*** (0.016)	0.544*** (0.030)	0.618*** (0.018)
N	834	2123	834	2123
R Squared	0.441	0.633	0.652	0.730

Note: standard errors in parentheses.

Table 50***Relationship between classroom structure and academic achievement by prior academic performance in ELA (ELA Lowest 25%) – 4th Grade – proficiency and gains***

	ELA Low 25		ELA Non-Low 25		Math Low 25		Math Non-Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.503** (0.011)	0.590*** (0.006)	0.621*** (0.001)	0.828* (0.078)	0.602** (0.020)	0.646** (0.012)	0.777 (0.165)	0.669*** (0.003)
Sex	0.589 (0.053)	0.587*** (0.006)	0.810 (0.135)	0.727*** (0.002)	0.838 (0.410)	0.850 (0.349)	1.278 (0.149)	1.191 (0.178)
White	2.455 (0.203)	1.140 (0.791)	1.607 (0.135)	0.718 (0.269)	2.308 (0.145)	2.039 (0.154)	0.832 (0.811)	1.019 (0.962)
Black	2.333 (0.316)	0.360* (0.081)	0.778 (0.629)	0.461** (0.019)	1.278 (0.692)	1.131 (0.816)	0.416 (0.258)	0.645 (0.304)
Hispanic	2.236 (0.272)	0.735 (0.535)	1.018 (0.971)	0.658 (0.162)	0.971 (0.959)	0.823 (0.692)	0.592 (0.485)	0.903 (0.795)

Table 50 – continued

	ELA Low 25		ELA Non-Low 25		Math Low 25		Math Non-Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
ESE	1.197 (0.575)	0.875 (0.531)	0.740 (0.147)	0.498*** (0.000)	1.055 (0.812)	1.195 (0.324)	1.150 (0.587)	1.287 (0.238)
ELL	0.491* (0.064)	0.686 (0.107)	0.642*** (0.004)	0.687*** (0.003)	0.565** (0.015)	0.951 (0.790)	0.853 (0.400)	0.698** (0.017)
SES	0.255*** (0.000)	0.358*** (0.000)	0.265*** (0.000)	0.534*** (0.000)	0.469*** (0.006)	0.354*** (0.000)	0.275*** (0.000)	0.531*** (0.000)
GHA	1.279 (0.512)	1.413 (0.295)	3.218*** (0.000)	2.409*** (0.000)	1.463 (0.348)	1.301 (0.390)	2.696*** (0.000)	2.423*** (0.000)
Math Low 25%	1.089 (0.763)	1.025 (0.905)	0.508*** (0.000)	0.482*** (0.000)	0.103*** (0.000)	0.071*** (0.000)	0.067*** (0.000)	0.059*** (0.000)
FY18 Scale Score	1.081*** (0.000)	0.971*** (0.000)	1.089*** (0.000)	0.963*** (0.000)	1.099*** (0.000)	0.979*** (0.000)	1.126*** (0.000)	0.990* (0.058)
N	834	834	2117	2117	834	834	2114	2114

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

Scale scores for fourth-grade students in the lowest 25% for ELA performance who were taught in the departmentalized classroom structure have scale scores more than 2.5 points lower than their peers who received instruction in the self-contained model, as compared to their non-ELA Low 25 peers who only scored 1.319 points lower than their self-contained peers. Math was also quite impacted with ELA Low 25 students scoring 2.595 points lower than their self-contained peers versus Non-ELA Low 25 students only scoring 0.780 points lower than their self-contained peers. The ELA Low 25 students also have lower likelihoods of being proficient or making gains than their self-contained peers in both ELA and Math. Math gains appears to be the relationship that varies the least, with ELA Low 25% students having a log odd ratio of 0.646 as compared to non-ELA Low 25% of 0.669, a difference of only 0.023. Although the magnitude of the negative relationship varies in fourth-grade, the relationship is still negative.

For fifth-grade, however, the students who scored in the Lowest 25% in ELA actually have a more positive relationship between math student achievement and the departmentalized classroom structure, as shown in Tables 51 and 52. Departmentalized students in the lowest 25% for ELA had a scale score an average of 1.876 points higher for math. These same students were also 1.479 times more likely to make a gain in math than their self-contained peers. However,

there were no significant relationships among any other measurement of student achievement for ELA lowest 25% students.

Table 51

Relationship between classroom structure and academic achievement by prior academic performance in ELA (ELA Lowest 25%) – 5th Grade – scale score

	ELA Low 25	ELA Non-Low 25	Math ELA Low 25	Math ELA Non-Low 25
	SS	SS	SS	SS
Classroom Structure	0.145 (0.901)	-0.210 (0.527)	1.876** (0.919)	-0.580 (0.569)
Sex	-2.674*** (0.714)	-1.884*** (0.414)	-1.937*** (0.732)	0.201 (0.451)
White	5.355 (4.296)	-1.237 (1.548)	2.721 (4.385)	-3.707** (1.676)
Black	3.127 (4.386)	-2.868* (1.687)	1.003 (4.475)	-5.320*** (1.831)
Hispanic	3.269 (4.291)	-2.786* (1.562)	1.466 (4.378)	-4.133** (1.691)
ESE	-2.444*** (0.810)	1.154 (0.788)	-0.262 (0.822)	0.876 (0.847)
ELL	-2.165*** (0.814)	-2.599*** (0.546)	0.461 (0.828)	-0.690 (0.587)
SES	-3.649*** (1.080)	-3.372*** (0.557)	-1.656 (1.104)	-2.210*** (0.602)
GHA	3.411*** (1.176)	3.331*** (0.536)	0.198 (1.206)	-0.188 (0.587)
Math Low 25%	-1.592** (0.758)	-1.687*** (0.625)	-16.227*** (0.867)	-14.566*** (0.718)
FY18 Scale Score	0.507*** (0.027)	0.654*** (0.018)	0.521*** (0.025)	0.653*** (0.016)
N	863	2273	863	2273
R Squared	0.494	0.645	0.639	0.709

Note: standard errors in parentheses.

Table 52

Relationship between classroom structure and academic achievement by prior academic performance in ELA (ELA Lowest 25%) – 5th Grade – proficiency and gains

	ELA Low 25		ELA Non-Low 25		Math ELA Low 25		Math ELA Non-Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.839 (0.562)	1.161 (0.474)	0.834 (0.361)	0.864 (0.318)	1.448 (0.198)	1.479* (0.062)	0.767 (0.294)	0.836 (0.178)
Sex	0.513** (0.013)	0.728** (0.053)	0.800 (0.108)	0.691*** (0.001)	0.908 (0.689)	0.719** (0.044)	0.678** (0.030)	0.787** (0.020)

Table 52 - continued

	ELA Low 25		ELA Non-Low 25		Math ELA Low 25		Math ELA Non-Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
White	0.390 (0.356)	1.519 (0.641)	0.486 (0.525)	1.269 (0.591)	0.453 (0.611)	1.207 (0.851)	0.000 (0.998)	0.655 (0.324)
Black	0.453 (0.474)	1.238 (0.817)	0.247 (0.215)	0.767 (0.568)	0.354 (0.516)	1.157 (0.886)	0.000 (0.997)	0.485 (0.116)
Hispanic	0.303 (0.247)	1.004 (0.997)	0.206 (0.157)	0.766 (0.545)	0.365 (0.518)	1.269 (0.812)	0.000 (0.997)	0.563 (0.184)
ESE	0.905 (0.793)	0.847 (0.376)	1.631** (0.027)	1.413* (0.092)	0.858 (0.574)	0.905 (0.587)	1.027 (0.926)	1.174 (0.414)
ELL	0.589 (0.141)	0.708* (0.078)	0.620*** (0.001)	0.574*** (0.000)	1.322 (0.317)	1.039 (0.837)	1.425* (0.080)	0.967 (0.799)
SES	0.548* (0.078)	0.387*** (0.000)	0.355*** (0.000)	0.563*** (0.000)	0.514* (0.050)	0.675 (0.111)	0.413*** (0.003)	0.777* (0.066)
GHA	2.092** (0.019)	2.336*** (0.001)	2.952*** (0.000)	3.000*** (0.000)	1.823 (0.132)	0.620* (0.084)	1.660** (0.023)	0.947 (0.690)
Math Low 25%	0.766 (0.334)	0.850 (0.359)	0.822 (0.242)	0.739** (0.043)	0.035*** (0.000)	0.047*** (0.000)	0.026*** (0.000)	0.079*** (0.000)
FY18 Scale Score	1.124*** (0.000)	0.955*** (0.000)	1.101*** (0.000)	0.979*** (0.000)	1.113*** (0.000)	0.957*** (0.000)	1.111*** (0.000)	0.980*** (0.000)
N	863	862	2273	2271	863	863	2273	2273

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

Math Lowest 25%

Similar to ELA Lowest 25%, the relationship between classroom structure and student achievement for students in the Math Lowest 25% varies in fourth and fifth grades. In fourth grade, the relationship is negative across the board, and more negative for students who are in the Math Low 25% cohort, as shown in Tables 53 and 54.

Table 53

Relationship between classroom structure and academic achievement by prior academic performance in math (Math Lowest 25%) – 4th Grade – scale score

	ELA Math Low 25	ELA Non-Math Low 25	Math Low 25	Math Non-Low 25
	SS	SS	SS	SS
Classroom Structure	-2.330*** (0.661)	-1.527*** (0.412)	-2.947*** (0.758)	-0.701 (0.462)
Sex	-1.931*** (0.659)	-1.525*** (0.402)	-0.155 (0.837)	1.289*** (0.454)
White	-1.084 (2.210)	-1.190 (1.001)	0.047 (2.537)	-0.378 (1.123)
Black	-4.184* (2.278)	-2.364* (1.186)	0.105 (2.621)	-4.184*** (1.335)

Table 53 - continued

	ELA Math Low 25	ELA Non-Math Low 25	Math Low 25	Math Non-Low 25
	SS	SS	SS	SS
Hispanic	-3.276 (2.175)	1.164 (1.009)	-1.018 (2.501)	-1.694 (1.132)
ESE	-2.021** (0.779)	-1.997*** (0.6450)	0.761 (0.886)	1.217* (0.720)
ELL	-2.207*** (0.741)	-1.082** (0.500)	-0.963 (0.847)	-1.701*** (0.553)
SES	-4.088*** (0.892)	-4.391*** (0.523)	-4.878*** (1.019)	-3.141*** (0.585)
GHA	0.108 (1.136)	4.743*** (0.509)	-1.077 (1.296)	5.770*** (0.560)
ELA Low 25%	-12.804*** (0.756)	-15.147*** (0.621)	-1.008 (0.814)	-2.399*** (0.672)
FY18 Scale Score	0.423*** (0.026)	0.486*** (0.016)	0.610*** (0.030)	0.593*** (0.018)
N	836	2121	836	2121
R Squared	0.658	0.729	0.469	0.615

Note: standard errors in parentheses.

Table 54

Relationship between classroom structure and academic achievement by prior academic performance in Math (Math Lowest 25%) – 4th Grade – proficiency and gains

	ELA Math Low 25		ELA Non-Math Low 25		Math Low 25		Math Non-Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom Structure	0.574** (0.014)	0.853 (0.359)	0.584*** (0.001)	0.711*** (0.003)	0.585** (0.015)	0.577*** (0.001)	0.780 (0.169)	0.686*** (0.007)
Sex	0.594** (0.020)	0.590*** (0.002)	0.835 (0.232)	0.731*** (0.004)	1.114 (0.630)	0.878 (0.446)	1.042 (0.806)	1.150 (0.288)
White	1.861 (0.359)	0.705 (0.493)	1.635 (0.314)	0.815 (0.475)	2.088 (0.235)	2.490 (0.112)	1.112 (0.876)	0.898 (0.789)
Black	0.957 (0.953)	0.257** (0.013)	0.950 (0.921)	0.520** (0.046)	2.558 (0.160)	2.213 (0.179)	0.361 (0.132)	0.407** (0.035)
Hispanic	1.688 (0.445)	0.481 (0.146)	1.073 (0.881)	0.730 (0.274)	1.124 (0.852)	1.314 (0.629)	0.661 (0.524)	0.692 (0.352)
ESE	0.866 (0.617)	0.616 (0.023)	0.842 (0.441)	0.585*** (0.002)	0.754 (0.329)	1.074 (0.722)	1.345 (0.176)	1.348 (0.124)
ELL	0.406*** (0.001)	0.552*** (0.003)	0.712** (0.044)	0.753** (0.033)	0.383*** (0.001)	0.659** (0.036)	0.937 (0.713)	0.845 (0.254)
SES	0.193*** (0.000)	0.349*** (0.000)	0.338*** (0.000)	0.548*** (0.000)	0.358*** (0.000)	0.337*** (0.000)	0.372*** (0.001)	0.600*** (0.007)
GHA	1.270 (0.484)	0.778 (0.376)	3.095*** (0.000)	2.879*** (0.000)	1.443 (0.254)	1.168 (0.584)	3.408*** (0.000)	2.965*** (0.000)
ELA Low 25%	0.072*** (0.000)	0.093*** (0.000)	0.031*** (0.000)	0.053*** (0.000)	1.099 (0.691)	0.918 (0.644)	0.707* (0.072)	0.536*** (0.000)
FY18 Scale Score	1.068*** (0.000)	0.967*** (0.000)	1.093*** (0.000)	0.963*** (0.000)	1.103*** (0.000)	0.987** (0.046)	1.122*** (0.000)	0.986*** (0.003)
N	835	835	2116	2116	835	835	2113	2113

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

Students in the Math Low 25 cohort in 4th grade show a large difference between the negative relationship they have with departmentalization as compared to their non-Math Low 25 peers in the departmentalized structure. Non-Math Low 25 peers in the departmentalized structure only score 0.701 points lower on the Math FSA than their self-contained peers. ELA scale scores are also more negatively impacted by the departmentalized classroom structure for students in the Math Low 25 than those that are not, with Math Low 25 students who are departmentalized scoring 0.803 points lower than their Non-Math Low 25 peers. Departmentalized students in the Math Low 25 score, on average, almost three scale score points lower on the math FSA than their peers in a self-contained classroom.

The fifth-grade results for Math Lowest 25% are shown in Tables 55 and 56. These results show no significant relationship between classroom structure and student achievement for students with prior poor math performance.

Overall, the relationship between student achievement and classroom structure varies by subgroup. The implications of these variations are discussed in the next section.

Table 55

Relationship between classroom structure and academic achievement by prior academic performance in Math (Math Lowest 25%) – 5th Grade – scale score

	ELA Math Low 25	ELA Non-Math Low 25	Math Low 25	Math Non-Math Low 25
	SS	SS	SS	SS
Classroom Structure	-0.559 (0.901)	0.042 (0.527)	1.520 (0.974)	-0.349 (0.558)
Sex	-2.400*** (0.697)	-1.933*** (0.418)	-2.673*** (0.754)	0.451 (0.448)
White	10.707* (5.846)	-1.128 (1.514)	1.577 (6.327)	-3.354** (1.607)
Black	9.267 (5.882)	-3.432** (1.662)	-0.674 (6.361)	-4.790*** (1.768)
Hispanic	8.160 (5.842)	-2.680* (1.528)	-0.200 (6.302)	-3.592** (1.623)

Table 55 - continued

	ELA Math Low 25	ELA Non-Math Low 25	Math Low 25	Math Non-Math Low 25
	SS	SS	SS	SS
ESE	-1.824** (0.824)	0.094 (0.753)	0.837 (0.894)	-0.194 (0.792)
ELL	-2.113*** (0.806)	-2.622*** (0.545)	0.896 (0.870)	-0.892 (0.574)
SES	-2.619** (1.035)	-3.575*** (0.567)	-1.143 (1.129)	-2.404*** (0.589)
GHA	3.553*** (1.115)	3.193*** (0.546)	1.702 (1.209)	-0.448 (0.589)
ELA Low 25%	-14.663*** (0.806)	-13.786*** (0.669)	-1.354* (0.814)	-2.550*** (0.678)
FY18 Scale Score	0.500*** (0.026)	0.655*** (0.669)	0.549*** (0.026)	0.642*** (0.016)
N	861	2275	861	2275
R Squared	0.691	0.737	0.478	0.590

Note: standard errors in parentheses.

Table 56

Relationship between classroom structure and academic achievement by prior academic performance in Math (Math Lowest 25%) – 5th Grade – proficiency and gains

	ELA Math Low 25		ELA Non-Math Low 25		Math Low 25		Math Non-Math Low 25	
	Prof	Gain	Prof	Gain	Prof	Gain	Prof	Gain
Classroom	0.773 (0.360)	0.932 (0.700)	0.875 (0.516)	0.698 (0.816)	0.957 (0.884)	1.127 (0.550)	1.060 (0.804)	0.957 (0.739)
Sex	0.681* (0.099)	0.719 (0.041)	0.745** (0.043)	0.699*** (0.001)	0.601** (0.046)	0.597*** (0.001)	0.839 (0.316)	0.857 (0.142)
White	171955661.3 (0.999)	1028374179 (0.999)	0.358 (0.251)	1.082 (0.855)	0.711 (0.822)	1.513 (0.763)	0.000 (0.997)	0.655 (0.297)
Black	195631819.5 (0.999)	945176384.1 (0.999)	0.170* (0.050)	0.589 (0.246)	0.749 (0.854)	1.227 (0.882)	0.000 (0.997)	0.524 (0.142)
Hispanic	88086910.24 (0.999)	617738456.6 (0.999)	0.179* (0.052)	0.674 (0.357)	0.410 (0.555)	1.318 (0.840)	0.000 (0.997)	0.616 (0.237)
ESE	1.450 (0.207)	0.927 (0.690)	1.401 (0.161)	1.240 (0.260)	0.603 (0.185)	1.139 (0.465)	1.115 (0.651)	0.971 (0.880)
ELL	0.624* (0.084)	0.634** (0.016)	0.593*** (0.001)	0.590*** (0.000)	1.530 (0.205)	1.102 (0.581)	1.354 (0.104)	0.917 (0.523)
SES	0.666 (0.226)	0.485*** (0.002)	0.352*** (0.000)	0.522*** (0.000)	0.440*** (0.005)	0.700 (0.126)	0.466** (0.028)	0.755** (0.045)
GHA	2.789*** (0.001)	2.612*** (0.000)	2.721*** (0.000)	2.937*** (0.000)	1.676* (0.090)	1.121 (0.659)	1.754** (0.024)	0.826 (0.177)
ELA Low 25%	0.080*** (0.000)	0.100*** (0.000)	0.067*** (0.000)	0.089*** (0.000)	1.558 (0.104)	0.962 (0.813)	1.238 (0.308)	0.790 (0.146)
FY18 Scale Score	1.116*** (0.000)	0.960*** (0.000)	1.101*** (0.000)	0.976*** (0.000)	1.117*** (0.000)	0.962*** (0.000)	1.109*** (0.000)	0.979*** (0.000)
N	861	861	2275	2272	861	861	2275	2275

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

Implications

The results of my study, which analyzes the relationship between ELA and math student achievement data for fourth and fifth grade students both overall and by subgroup, show variability in the relationship that classroom structure has with student achievement. This relationship is, overall, negative for fourth grade students when it comes to scale score, but positive when it comes to likelihood of being proficient or making gains. In fifth grade, very little of the relationship is significant. For both fourth and fifth grade, the relationship between structure and achievement varies by subgroup. A summary of whether the relationship between student achievement and departmentalization was positive or negative for each fourth-grade subgroup is displayed in Table 57. The results indicate that both overall, and in each subgroup, fourth-grade students have a negative relationship between student achievement and departmentalization.

Table 57

Relationship between student achievement and departmentalization – 4th Grade

	Student Achievement's Relationship with Departmentalization						Student Achievement's Relationship with Departmentalization Compared to Non-Members of the Subgroup					
	ELA			Math			ELA			Math		
	SS	Prof	Gain	SS	Prof	Gain	SS	Prof	Gain	SS	Prof	Gain
Overall	-	-	-	-	-	-						
White		-	-	-		-		-		+		-
Hispanic	-	-	-	-		-	-	-				+
Black					-	-					-	-
Sex (F)	-	-	-	-	-	-	+	-	-	-		-
ESE	-	-	-	-		-	-	-	-	-		-
ELL	-	-		-			+	-		+		
Low SES	-	-	-	-	-	-		+	+	+		+
GHA												
ELA Low 25%	-	-	-	-	-	-	-	-	-	-		-
Math Low 25%	-	-	-	-	-	-	-	-		-		-

Note: + means the relationship was positive, - means the relationship was negative, and no marking means the relationship was not significant

Also displayed in Table 57 is a comparison of whether the students in any specific subgroup had a more negative or positive relationship between student achievement and the departmentalized classroom structure than the students not in that subgroup. These relationships also vary, and, sometimes, are the opposite of the relationship between achievement and classroom structure. For example, fourth grade ELL students had a negative relationship in both math and ELA between student achievement and the departmentalized classroom structure. However, for all six measures of student achievement, ELL students in fourth grade did better than non-ELL students, even though the relationship was still negative. Students in the Low 25 for ELA in fourth grade had a negative relationship between student achievement and the departmentalized classroom structure, and this relationship was more negative than their non-Low 25 ELA peers. Yet, as a reminder, all subgroups of students in fourth grade demonstrated a negative relationship with departmentalization. For fourth grade students who are already in traditionally underachieving groups, such as prior poor performing (ELA or Math Low 25), ESE students, or students of color, the relationship between departmentalization and classroom structure was, more often than not, more negative than their departmentalized peers who are not part of that subgroup. When it comes to students who already have barriers to equitable education outcomes, the departmentalized classroom structure does not work to help students overcome those barriers.

The relationship between classroom structure and student achievement, as I stated in Chapter 2, has been studied previously with mixed results. The results of this study support the mixed nature of results from prior studies. In this study a positive relationship between departmentalization and student achievement as measured via scale score, proficiency, and gains, was found more often with math than with ELA, similar to some prior studies (Nelson, 2014;

Webel, et. al., 2017; Yearwood, 2011) but in contradiction to others (Baroody, 2017; McGrath & Rust, 2002). Also described in Chapter 2 was the importance of explicit instruction of cross-curricular connections, especially for marginalized students. Students in the self-contained classroom structure engaged more often in lessons that tied together topics across content areas, and that strategy is associated with higher levels of student achievement (Aslan, 2016; Lobdell & van Ness, 1963; Neumen, Kaefer, & Pinkham, n.d.). The results of this study, which strongly demonstrate a negative relationship between departmentalization and students of color, previously poor performing, those learning English, and those with a learning disability, could indicate that this may be a reason for the difference in achievement levels between the two classroom structures.

The role of this dissertation was to add subgroup information to the general achievement data previously available. Recommendations based on the results of the data are shared in the next section.

Recommendations

There is a relationship between student achievement and classroom structure in 4th grade, and that relationship varies by student demographics. The recommendations based on the results of this study fall into two broad categories – recommendations that could be incorporated into future scheduling practices and recommendations for areas of further study. When it comes to future scheduling practices it is important to remember that, in the vast majority of cases, fourth and fifth grade are scheduled separately. This allows us to make different recommendations based on the grade level of the students being discussed.

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 ratings. Fourth-grade students had an overwhelmingly negative relationship with student achievement. There were no examples of a positive relationship between either ELA or math scale score for fourth grade students engaging in a departmentalized classroom for any subgroup. Additionally, many subgroups in fourth-grade had negative relationships with all three measures of student achievement, including those most at risk of being subject to the achievement gap, including Hispanic students, ESE students, ELL students, students in the Lowest 25% for ELA, and students in the lowest 25% for math. Because of this, I would recommend that any classes being formed for fourth grade students that will contain students a majority of students who are ESE, ELL, or in the lowest 25% for either ELA or Math engage in the self-contained classroom structure. Additionally, as there is both an overall statistically significant negative relationship between classroom structure and student achievement, as well as one with each subgroup, I would recommend that schools not begin any new departmentalization at the fourth-grade level. For school sites where departmentalization is already implemented at the fourth-grade level, it is my recommendation that stakeholders look at the student achievement of those students and re-examine the decision to implement departmentalized classrooms at that grade level. This could be especially powerful at a school who implements multiple classroom structures per grade level. As the data shows that students who traditionally have lower levels of achievement evidenced by the achievement gap, taking deep dive into the demographic makeup of classes which engage in each classroom structure can allow for a more strategic determination of which classroom structure to implement.

The fifth-grade results do not show a significant relationship between classroom structure and student achievement; thus, these results should not be used to inform any scheduling recommendations. This insignificant relationship was consistent for both research questions one and two and nearly every subgroup for all three measures of student achievement, indicating there is not a relationship between student achievement and classroom structure at the fifth-grade level.

Instead, the fifth-grade results indicate additional areas for study and leave a lot of questions to be answered. For example, in five of the six measures of student achievement, fifth grade students from a Low SES background had a positive, but insignificant, relationship between student achievement and departmentalization. Is this relationship significant, and potentially still positive, on a school wide level, say, for example, at low income schools? Departmentalization was also far more common at the fifth-grade level, with 81% of students departmentalized versus 58% at the fourth-grade level. The literature demonstrated that there are many reasons why stakeholders might choose to engage in the departmentalized classroom structure, including a potential increase in lesson quality (American Association of School Administrators, 1965; Rogers, 2012). Given the higher prevalence of departmentalization at the fifth grade level, another area for future study could be an exploration of why different teachers chose to engage in the departmentalized classroom structure as compared to the achievement of their students. Additionally, my study did not look at science assessment results, however the state school-based accountability system does include science results for fifth-grade. How do the science student achievement scores fit into this? For fifth-grade overall, ELA had a negative relationship between student achievement and departmentalization while math had a positive

one. By knowing the relationship science student achievement has with departmentalization an even more informed scheduling decision could be made.

Conclusion

Ensuring that schools engage in effective practices to maximize student achievement is critical. Elementary schools make a critical decision when determining the classroom structure their fourth and fifth grade classrooms will engage in. The purpose of this study was to look at the relationship between student achievement and classroom structure for fourth and fifth grade classrooms and respond to two research questions. Research question one asked, “what is the relationship between student achievement and classroom structure?”. Research question two asked, “does this relationship vary by student subgroup?”. Student achievement was measured for both ELA and math based on the results of the Spring 2019 FSA, as measured by student scale score, proficiency, and gains. I found that, overall, for fourth grade students, ELA and math achievement levels are lower when students engage in a departmentalized classroom structure, while for fifth-grade students, ELA scores are lower while math scores are higher when in a departmentalized classroom. This relationship does vary by subgroup, with variation occurring at both the content area level as well as at the grade level.

This dissertation adds to the body of knowledge surrounding student achievement when engaged in a departmentalized classroom structure. Although not a specific research questions, the study determined that departmentalization has a more negative relationship with student achievement in fourth grade than in fifth grade. As a result, the implications of the results of the study on immediate strategic scheduling opportunities is fairly limited to fourth-grade, there is room for additional studies to further explore the relationships demonstrated within the study.

Dissemination Plan

The purpose of my dissertation is to identify to what extent a relationship exists between classroom structure and student achievement, and if that relationship varies based on student demographic. The intention is to inform those stakeholders who make decisions regarding course scheduling at the upper elementary level. Stakeholders can use this information to be more strategic when determining which student subgroup to schedule into classes of a specific structure.

Sharing with Primary Stakeholders

The primary stakeholders for my dissertation are the school-based administrators and educators for the elementary schools located within the South Florida district my DiP is studying. As part of the agreement with the district that enables me to access the data I will need to share a short, written executive summary of the results of the study with the principal of each school involved. This short summary will be shared in the Spring of 2021, with potential impact on course scheduling for the 2021-2022 academic year. I will accompany with the summary a two to three slide PowerPoint Presentation with speakers notes outlining the results of the study, with the recommendation that they share the findings with their teachers at any of their usual meeting times, such as at a monthly faculty meeting or grade level planning session.

Sharing with Additional Stakeholders

The secondary stakeholders include both district leadership as well as parents. District leadership will receive the executive summary that building principals receive. The Executive Director of Elementary Programming and the Associate Superintendent of Curriculum and Instruction have both requested meetings to discuss the results of the study and the potential impact the results can have on our district. During the meeting with them additional short in

person presentations, guided by a short summarizing PowerPoint, including a potential presentation to the cabinet and school board, will be proposed. School board meetings are open to the public, and that presentation would be how parents are be informed of the results of the study.

APPENDIX A

IRB APPROVAL

FLORIDA STATE UNIVERSITY
OFFICE of the VICE PRESIDENT for RESEARCH



EXEMPTION DETERMINATION

July 6, 2020

Amity Wyss, 850-844-5200
[redacted]@fsu.edu

Dear Amity Wyss:

On 7/6/2020, the IRB staff reviewed the following submission:

Type of Review:	Exempt (4) Secondary research on data or specimens (no consent required)
Title:	Achievement Analysis by Subgroup: Is There a Correlation between Student Achievement and Upper Elementary Class Structure?
Investigator:	Amity Wyss
Submission ID:	STUDY00001465
Study ID:	STUDY00001465
Funding:	None
Grant ID:	None
IND, IDE, or HDE:	None
Documents Reviewed:	• Wyss IRB Application.pdf, Category: IRB Protocol;

The IRB staff determined the protocol qualifies for exemption, effective on 7/6/2020.

You are advised that any modification(s) to the protocol for this project that may alter this exemption determination must be reviewed and approved prior to implementation of the proposed modification(s).

Modifications to the research may invalidate the exemption determination (because the research no longer meets the exemption criteria described in HRP-312 – WORKSHEET – Exemption Determination).

Examples of minor changes to exempt research that would *not* alter the exemption determination and should therefore not be submitted to the IRB for further review include the following:

- Making administrative (formatting, grammar, spelling) revisions to the protocol, consent or recruitment materials or other study documents
- Adding or revising non-sensitive questions or non-identifiable response options to a survey, interview, focus group or other data collection instrument
- Increasing or decreasing the number of study subjects—*unless* adding a new study sample such as children or prisoners or adding a new source of data or records
- Making study team/personnel changes—*except* a change in Principal Investigator (PI)

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BIOGRAPHICAL SKETCH

Amity A. Wyss

Strengths: Self-Motivated leader who possesses a natural empathy to help me quickly relate and come up with responsible solutions. Highly focused, allowing me to manage time well and formulate strategies to solve problems and complete tasks efficiently.

Education:

- Florida State University
 - Anticipated Graduation May 2021, 3.9 GPA
 - Educational Leadership, Ed. D.
 - *Dissertation Title: Achievement Analysis by Subgroup: Is There a Benefit to Intermediate Departmentalization?*
 - Program Evaluation Certificate
- American College of Education
 - Class of 2015, 4.0 GPA
 - Educational Leadership, M. Ed.
- University of Central Florida
 - Class of 2010, 3.667 GPA
 - Biology Education, BS Honors

Work Experience:

- Assistant Principal of Curriculum and Instruction, 2017-Present
 - Integral member of administrative team that develops and implements mission and vision for school
 - Assists principal in the development and establishing of schools goals and aligns instructional practices to the school improvement plan
 - Handles disciplinary procedures for students
 - Coordinates all state and local assessments
 - Assists principal in evaluation and documentation staff performance
- Science Coach, 2013-2017
 - Design and implement professional development, Model lessons, Mentor teachers, Analyze student assessment and behavioral data
 - Active member of the leadership team, Support school-wide initiatives
 - Assist district Science department with curriculum revisions
 - Department chair, Team Leader, Science Fair Coordinator
- Instructor 8th Grade Science, 2010-2013
 - iPad Classroom, Discovery Educator Network Star Educator, FIZZ Flipped Classroom Certified, previous AVID Science Instructor, Lesson Study Team Leader
- CPALMS Student Tutorial Author, January – March 2015
- Coordinator of Specialists and Scheduling, 2012-2020
 - Create daily schedules for campers aged 3-15, organize and run special

events, train counselors on effective leadership techniques

Recent Awards and Achievements

- District Assistant Principal of the Year 2021
- Ironman Florida 70.3 2018 Finisher
- UCF Young Alumni 30 under 30 Class of 2017
- Golden Apple Teacher of Distinction 2017

Professional Development and Conference Presentations By Amity Wyss:

- Diversity, Equity, and Inclusion Cohort Lead
- Come SEL Away – Implementing a school wide Social Emotional Learning Initiative - FASA Discover '20, *Accepted Presenter*, delayed COVID June 2020
- Middle School Cross-Curricular STEM Lessons - NSTA National STEM Forum and Expo, *Presenter*, May 2015
- Local STEM Conference, *Presenter*, Fall 2015
 - Cross Curriculum Connections - Teaching ELA Comprehension and Coding Through Robotics
- EdCamp Table Facilitator, February 2016
- Sampling of In School Professional Development Topics Covered:
 - Social Distancing and Collaborative Structures
 - Maintaining Parent Connections during Pandemic Operations
 - Data Based Differentiation
 - Writing Instruction in the Science and Social Science Content Areas
 - Strategic Use of Collaborative Grouping
 - Rigor and Group Work
 - Effective use of Stations at the Middle School Level
 - Flipped Classroom & Technology Integration
 - Instruction of LAF and MAF Standards in SS, Science, and Related Arts
 - Formative Assessments and Data Analysis to Drive Instruction
 - 15 in 15 – 15 apps in 15 minutes for your single iPad Classroom
 - Learning Goals and Scales
 - Instructional Rounds – What does Marzano look like in practice?