11-25-2020

The effects of positive behavior interventions and supports on the number of discipline referrals and academic achievement of fourth and fifth grade students

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A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Elementary, Middle, & Secondary Education Administration
in the Department of Educational Leadership

Mississippi State, Mississippi

November 2020

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Title of Study: The effects of positive behavior interventions and supports on the number of discipline referrals and academic achievement of fourth and fifth grade students

Pages in Study 118

Candidate for Degree of Doctor of Philosophy

Student achievement is one of the most important aspects of school life. With the rise in current standards and the pace to which teachers and students are expected to conduct their lessons, teachers must find ways to improve student behaviors by nonpunitive discipline techniques. Positive Behavior Interventions and Supports (PBIS) is a form of classroom management that focuses on the good behavior rather than the bad behavior. A rural school in Mississippi took on such an initiative by implementing PBIS as a schoolwide discipline management plan after the 2011-2012 school year. The purpose of the study was to determine the effect of the implementation of PBIS on the number of discipline referrals and conduct trend analysis of the number of discipline referrals after the schoolwide implementation of PBIS. Further, the study sought to determine if there were statistically significant relationships between the number of discipline referrals and English language arts score and the number of discipline referrals and mathematics scores.

An existing database from a rural school in Mississippi was compiled and analyzed for the purpose of the study. Data were analyzed for a year before PBIS implementation and seven years following PBIS implementation.

The findings of the study indicated there was a statistically significant difference in the number of discipline referrals before PBIS implementation when compared to the first year following full implementation. The trend data indicated that Black males consistently had the highest number of discipline referrals and had the lowest test scores in ELA and mathematics. Further, the findings showed there were consistently negative relationships among the number of discipline referrals and ELA scores and the number of discipline referrals and mathematics scores.

DEDICATION

This research effort is dedicated to my wife, Cherry, and my son, Joseph. Thank you both for your support.

ACKNOWLEDGEMENTS

I am thankful for the support of my committee members Dr. Leigh Ann McMullan, Dr. Clay Armstrong, Dr. Stephanie King, and Dr. Frankie Williams. Thank you to Dr. Williams for your guidance and for answering the dozens of emails sent your way. Thanks to Dr. Eric Moyen for being a calm voice throughout this process.

I am especially thankful for my friend, Dr. Rick Balkin. Without your willingness to help, I would not have been able to complete this research study.

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CHAPTER I

INTRODUCTION

Background of the Study

Effective strategies to curb classroom management issues and negative student behavior are necessary to advance student achievement (Blank & Shavit, 2016). One innovative measure implemented by many school districts as an alternative to consequence-based student discipline is Positive Behavior Interventions and Supports (PBIS; Collins & Ryan, 2016; Horner & Sugai, 2013; Shukla, Konold, & Cornell, 2016). PBIS is a disciplinary strategy that uses techniques in opposition to the usual exclusionary or forceful methods such as school suspension, out-of-school suspension, and corporal punishment as responses to negative behavior (Christofferson & Callahan, 2015; Cornell et al., 2011). PBIS includes research-based, proactive, classroom-level discipline standards within a multitiered system dedicated to the support of students' behavioral, social, and academic proficiency (Averill & Rinaldi, 2011).

The purpose of PBIS is to improve student behavior and increase academic outcomes (Averill & Rinaldi, 2011; Wasilewski et al., 2008). PBIS may be linked to initial studies of applied behavior analysis (Wasilewski et al., 2008). Cooper et al. (2005) described applied behavior analysis as "the science in which the principles of the analysis of behavior are applied systematically to improve socially significant behavior, and in which experimentation is used to identify the variables responsible for change in behavior" (p. 20). Horner and Sugai (2015)

suggested that applying behavior analysis and understanding student behavior can improve the overall atmosphere of the school.

For controlling student behavior while maintaining academic growth, PBIS requires teachers to use a more positive approach to direct student behavior (Collier-Meek & Pons, 2013; Farrell, 2013; Medina, 2017). Teachers recognize positive behavior whenever possible and reward students (or classes) for such behavior instead of constantly punishing negative behavior (Nese & McIntosh, 2016). Further, these rewards can be given for academic achievement as well as good behavior (Nese & McIntosh, 2016). Instead of focusing on negative behaviors, teachers are encouraged to focus on students' productive behaviors and to highlight these actions (Nelson et al., 1998). Positive discipline behavior encourages all students to act in a positive way which in turn garners praise from the teachers (Warren et al., 2006).

PBIS allows the teacher to maintain power in the classroom, effectively control student behavior, and keep the students in the classroom setting for longer periods of time (Nelson et al., 1998). Essentially, office referrals and negative adult responses to unwanted student behavior become a last resort rather than a first response (Nelson et al., 1998). As a result, there is a positive impact on student achievement (Johnson et al., 2013).

Numerous studies showed the PBIS discipline standard of not focusing on negative behaviors and punishments improved student behavior and student academic growth when operated with fidelity (Christofferson & Callahan, 2015; Flannery et al., 2013; Medina, 2017; Putnam et al., 2002; Wasilewskil et al., 2008). Nonetheless, there were limited research studies found that focused on the effects of PBIS in school districts in the state of Mississippi.

Statement of the Problem

The present study was intended to address the issue of problematic student behavior and resulting responses of exclusionary consequences from educators. When a student is removed from the classroom for behavior, the student can no longer receive instruction, and as a result, cannot make academic gains (Perry & Morris, 2014). According to the United States Department of Education, of the 49 million students enrolled in the United States during 2011-2012, approximately 7 million students received in-school suspensions (ISS), out-of-school suspensions (OSS), or corporal punishment in a given year (Green, 2015). In other words, approximately 15% of students across the nation received punishment that required them to be removed from the classroom setting. When considering the 49 million students enrolled in schools across the United States in the 2011-2012 school year, 3.5 million received one OSS, 1.5 million received multiple OSSs, and 130,000 were expelled (Stalker, 2018). Further, policy analysis found that during the 2015-2016 school year, 2.7 million students in the United States received one or more OSS (Rafa, 2019). Alarmingly, a survey study for the 2017-2018 school year revealed that 962,000 violent incidents and 476,100 nonviolent incidents were reported to have occurred in schools (Dilberti et al., 2019). Of schools reporting, 71% reported violent discipline incidents and 65% reported nonviolent discipline events (Diliberti et al., 2019). Another study suggested there were extreme racial disparities in student discipline (Okonofua et al., 2016). These referrals had negative effects on students, including poor academic achievement (Okonofua et al., 2016; Rafa, 2019).

Data for the 2011-2012 school year in the state of Mississippi showed that 6 out of 10 students were given exclusionary punishments for bad behavior, which was for the most part higher than any neighboring state (National Association for the Advancement of Colored People

of Mississippi [NAACPMS], 2013). In a selected local school district within the state of Mississippi during the same school year, over 17% of students received disciplinary consequences that removed them from the classroom setting (Student-wide Information System [SWIS], 2019). Further, during the 2014-2015 school year, one Mississippi school district suspended 42% of students, while another suspended 35% of students (Mader, 2017). Also, during the 2014-2015 school year in Mississippi, 13% of Black students received OSS, while only 4% of White students received the same (Mader, 2017).

In addition to problematic student behavior resulting in exclusionary consequences, research studies showed overrepresentation of minorities and males in receiving office discipline referrals for behavioral infractions (Martin et al., 2016). Black students were three times more likely to be suspended for discipline infractions than White students, and males were more likely to be given punishment for inappropriate behavior (Martin et al., 2016).

During the 2011-2012 school year at the rural school district, minority students represented approximately 47% of students but 55% of office discipline referrals (SWIS, 2019). Even further, the number of discipline referrals given to males was approximately doubled the rate of referrals for females (SWIS, 2019). During the 2018-19 school year, minority students represented approximately 71% of discipline office referrals (SWIS, 2019) with Black males having 47% of the office referrals (SWIS, 2019).

Purpose of this Study

The primary purpose of this study was to investigate the effects of the implementation of PBIS in a rural school district in Mississippi. Specifically, this study aimed to determine whether there was a positive effect on student behavior (i.e., fewer disciplinary referrals) and academic outcomes after implementation of PBIS. This research study examined the number of

disciplinary referrals and academic achievement of students at the end of the 2011-2012 school year in which the students were enrolled in fourth grade before implementation, and then at the end of fifth grade (2012-2013 school year) after implementation of PBIS. In addition, this research study sought to determine data trend Analysis for the number of disciplinary referrals and English language arts (ELA) and math academic achievement scores over the seven years after implementation of PBIS (2012 through 2019).

Research Questions

The following research questions guided this study. The study focused on trend analysis and the effects of PBIS on the number of disciplinary referrals and academic outcomes of fourth and fifth grade students.

1. Are there statistically significant differences by gender and race/ethnicity in the number of disciplinary referrals after the implementation of the first year of PBIS as measured using data for the number of disciplinary office referrals when students were enrolled in the fourth grade before implementation of PBIS and fifth grade after implementation of PBIS (2011-2012 to 2012-2013 school years)?

2. What are the trends by gender and race/ethnicity in the number of disciplinary office referrals, ELA scores, and math scores for fourth- and fifth-grade students after the implementation of PBIS over a seven-year period (2012-2019)?

3. Do relationships exist between the fourth-grade students' number of disciplinary referrals and academic achievement scores and the fifth-grade students' number of disciplinary referrals and academic achievement scores as measured by the end-of-year proficiency exams in ELA one year before implementation and seven years after implementation of PBIS (2012-2019)?

4. Do relationships exist between the fourth-grade students' number of disciplinary referrals and academic achievement scores and the fifth-grade students' number of disciplinary referrals and academic achievement scores as measured by the end-of-the-year proficiency test in math one year before implementation and seven years after implementation of PBIS (2012-2019)?

Definition of Key Terms

The following definitions are used throughout this study. The definitions provide meaning and clarity throughout the study.

1. *ELA and math academic scores* are determined by the end-of-year ELA and mathematics proficiency results. For the 2011-2012, 2012-2013, and 2013-3014 school years, a 0 to 200 scale was used. For the 2014-2015, 2015-2016, 2016-2017, 2017-2018, and 2018-2019 school years, a 400 to 499 scale was used for fourth-grade scores and a 500 to 599 scale was used for fifth-grade scores (Mississippi Department of Education, 2012).

2. *Corporal punishment* is defined as a mode of discipline when physical punishment is intentionally administered to students for the purpose of curtailing negative behavior (Arcus, 2002).

3. *Disciplinary referrals* are defined as student behavior incidents that are reported to the administration (by paperwork) and handled according to the student handbook (Grenada School District, 2019).

4. *In-school suspension* (ISS) refers to a mode of discipline that removes the student from the classroom setting for negative behavior but allows the student to remain on campus in a separate, more structured environment (Nielsen, 1979).

5. *Out-of-school suspension* (OSS) refers to a mode of discipline that removes the student from the classroom setting as well as the campus setting for negative behavior. The student is not allowed on campus for a period (O'Conner et al., 2014).

6. *Positive behavior interventions and supports* (PBIS) refers to a multitiered mode of discipline used by teachers to teach students rules and regulations of the school or classroom in a positive manner that is comparable to teaching an academic subject. Components of this form of discipline include active teaching and reinforcement, consistent implementation of consequences, and data-driven interventions (Christofferson & Callahan, 2015; Nelson et al., 1998). Further, PBIS includes a tiered process that allows educators to react with a variety of responses according to the severity and repetitive nature of student discipline (Averill & Rinaldi, 2011).

7. *Tier 1* is a PBIS component directed at all students, characterized by good planning, teaching, classroom management, and a proactive reward system for students (Averill & Rinaldi, 2011).

8. *Tier 2* is a PBIS component directed at a few students in every classroom, which includes rapid responses and small-group interventions (Averill & Rinaldi, 2011).

9. *Tier 3* is a PBIS component directed at a few students in the entire school, which includes intense, assessment-based responses directed at a very select group of students (Averill & Rinaldi, 2011).

Conceptual Framework of the Study

Figure 1 provides an illustration of the conceptual framework for this study. This study includes the following variables: (1) number of students' office discipline referrals, (2) academic achievement scores for ELA, and (3) academic achievement scores for mathematics. The treatment for the study includes the components of PBIS.

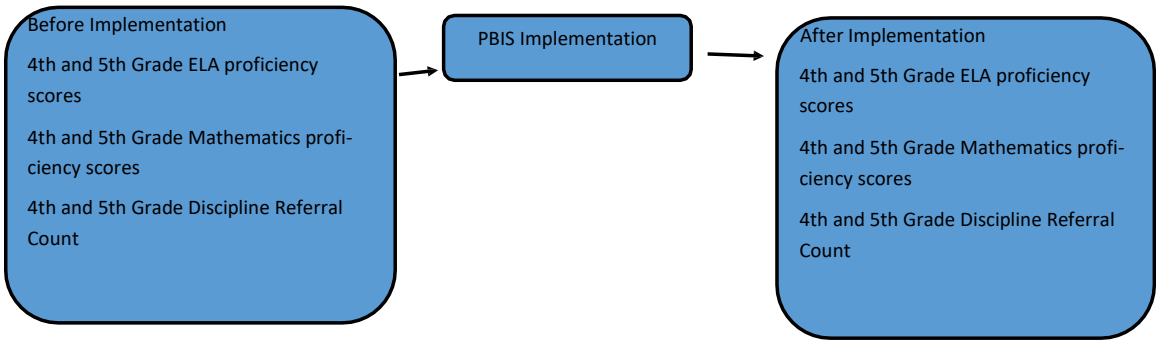

Figure 1. *Conceptual Framework of the Study*

Figure 1 represents the design of the study. ELA scores, mathematics scores, and discipline referral count have been reviewed before and after the treatment of the study, which is the implementation of PBIS.

Theoretical Framework of the Study

PBIS discipline models align with the social learning theory (Bradshaw et al., 2008). The social learning theory relies on learning through observations or personal experiences (Bandura, 1971). PBIS is a system of behavior adjustment in which students are taught behaviors, comparable to how students are taught academic subjects (Bradshaw et al., 2008). Students can learn through observations and explanations (Ross, 2012). One study suggested that learning can take place without direct involvement from the educator (Hoover et al., 2012). In other words, students can learn vicariously by watching another student's behaviors and consequences or rewards given. Further, one researcher considered PBIS to be a great example of students being taught universally accepted behaviors (Bradshaw, 2008)

Overview of the Methodology

A quasi-experimental quantitative research design and trend analysis were used to answer the research questions for this study. An existing dataset was utilized for the statistical comparisons and trend analysis. The data for this study were collected by the researcher from appropriate computer-based data collection software programs from local school district personnel. Discipline data from the year before implementation of PBIS and after the first year of implementation of PBIS were compared and statistically analyzed. In addition, data over the subsequent seven years (2012-2019) after implementation of PBIS were used to determine trend analysis for students enrolled in fourth grade and fifth grade.

Delimitations of the Study

This study was confined to a dataset for an elementary school in a rural setting. The data included disciplinary referrals and academic achievement scores for two academic years for one group of students (2011-2012 for fourth grade and 2012-2013 for fifth grade) and seven academic years for fourth and fifth grade classes after implementation of PBIS from the 2013-2014 to the 2018-2019 school year. The academic achievement variables included ELA and math proficiency exam scores for students at the end of fourth grade and again at the end of fifth grade and then for seven academic years.

Significance of the Study

The findings of this study may contribute to the literature focused on discipline, student achievement, and PBIS. This study is important in that school-level administrators and teachers may use this information to help improve students' negative behaviors as well as teachers' negative responses to negative behaviors. The overarching significance of the study is to improve students' academic achievement.

Organization of the Study

Chapter 1 of this study includes an introduction to PBIS, the research questions, definition of terms, overview of the research methodology, delimitations, significance, and organization of the study. Chapter 2 gives a summary and synthesis of literature related to historically common student discipline practices before the implementation of PBIS, academic achievement and behavior data, and student discipline and academic achievement data after the implementation of PBIS. Chapter 3 includes an explanation of the research design and methodology used to determine statistical differences, relationships, and trend analysis. Chapter

4 of this study includes descriptive statistics and data analysis. Chapter 5 provides is a discussion of results of the study, conclusions, limitations, recommendations, and implications for school leadership.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter presents a review of the related literature. For this study, many sources such as academic journal articles, books, and electronic media were searched for literature related to this study. This chapter includes brief explanations of traditional modes of discipline, such as corporal punishment, ISS, and OSS. Further, the chapter includes a summary of the extant literature related to PBIS, its components, and the effects on student discipline and academic outcomes. A concluding section is presented on PBIS and school leadership.

Student Discipline and Historical Approaches to Negative Behavior

Since the dawn of organized formative education both public and private, the debate of how to properly discipline students who engaged in negative behavior has been an ongoing discussion (Kirkman et al., 2016). Students were consistently punished for negative behaviors instead of being rewarded for positive behavior, especially minority students (Gregory, et al., 2014; Vincent et al., 2012). Punishments such as corporal punishment, ISS, and OSS were frequently used (Vincent et al., 2012).

Corporal Punishment

Corporal punishment refers to the use of physical punishment (e.g., striking, hitting, or slapping the buttocks or hands with the hand or a wooden paddle) for the purpose of redirecting

or correcting student behavior (Alsaif, 2015). Many parents and educators supported corporal punishment as an appropriate form of student and child discipline (Holden et al., 1999). Most literature and research studies indicated that corporal punishment was not an effective discipline tool for the purpose of improving student behavior or maintaining or improving student academic achievement (Dupper & Montgomery-Dingus, 2008; Durant & Ensom, 2012; Ferraro & Weinreich, 2006; Gershoff & Bitensky, 2007; Greydanus et al., 2003; Han, 2011; Jambor, 2001).

Specifically, Ahmad et al. (2013) used a correlation analysis to determine the statistical relationship between corporal punishment and student motivation for classroom learning. The researchers found a noticeably negative relationship between corporal punishment and student motivation. In addition, the study illustrated the same unfavorable affiliation to student achievement.

Another study used a Likert scale to analyze teacher attitudes towards corporal punishment and mathematics achievement scores to determine the effectiveness of classrooms that administered and did not administer corporal punishment (Ali et al., 2015). The study found that students of teachers who did not prefer corporal punishment had higher mean mathematics scores than students of teachers who did prefer corporal punishment.

ISS

ISS is a common discipline practice that requires students to be removed from the classroom setting but remain on campus in a more secure, private environment (Cholewa et al., 2018). ISS allows the student to be removed from the classroom for the problem behavior and still receive school-provided educational services (cite). ISS programs prevent students from having normal, day-to-day interactions with any students on campus (Morris & Howard, 2003).

ISS students are isolated during the entire day including lunch and break times (Morris & Howard, 2003). During this time, ISS students are focused entirely on schoolwork provided by the teacher (Morris & Howard, 2003).

Related research showed that exclusionary punishments including ISS were ineffective in changing student behavior and improving academic performance (Blomberg, 2003; Cholewa et al., 2018; Short & Noblit, 1985; Turpin & Hardin, 1997). Distinctly, Morris and Howard's (2010) study involved case studies of 10 schools and suggested that ISS punishment did not improve academic performance, especially if these programs did not include major academic components (Morris & Howard, 2010). Further, a case study involving 364 students in a rural setting indicated consistent findings in that ISS was not effective for improving academic performance (Turpin & Hardin, 1997).

OSS

OSS refers to a common discipline practice that requires the student to be completely removed from the school setting for problem behaviors (Flanner et al., 2014). While this mode of discipline was found to alleviate the issues in the classroom, it did not attempt to gain understanding or correct the behavior with the student (Blomberg, 2003; Constenbader & Markson, 1998). Research studies focused on OSS indicated that exclusionary punishments including OSS had a negative effect on student performance (Christle et al., 2004; Cobb-Clark et al., 2015; Flanner et al., 2014; Hemphill & Hargreaves, 2009; Noltemeyer et al., 2015; Wolf et al., 2016). Further comparison was made from a study involving surveys from 252 students (Constenbader & Markson, 1998). These surveys revealed that over 30% of students felt that OSS punishment did not improve behavior or academic achievement (Constenbader & Markson, 1998).

Student Discipline and Academic Achievement

Several studies suggested a direct correlation between a high number of disciplinary referrals and low academic achievement (Blank & Shavit, 2016; Cholewa et al., 2017; Hemphill & Hargreaves, 2009; Lee et al., 2011; Noltemeyer et al., 2015). More directly, studies discussed the unfavorable impact negative consequences for bad behavior had on academic achievement in that students who were suspended were more likely to drop out of school (Cholewa et al., 2017; Hemphill & Schneider, 2013). Fabelo et al. (2011) revealed that of the students who received suspensions as part of their disciplinary actions, 31% were more likely to repeat a grade and 10% were more likely to drop out of school.

More specifically, Wiseman and Hammer (2014) found that students with a high discipline referral count were more likely to score low proficiency in mathematics compared to those without referrals at a decrease of 40% . Further, Wiseman and Hammer's (2014) research study suggested that as the number of discipline referrals increased, so did the likelihood of poor academic results. Students with two to four referrals were 2.7% more likely to score below proficient, and students with five or more referrals were 4.6% more likely to score below proficient (Wiseman & Hammer, 2014).

Noltemeyer et al. (2015) conducted a meta-analysis to determine the statistical relationship between student behavior and academic results. In their research study, 53 cases were reviewed, and the researchers revealed a significant statistical relationship between suspension days and academic achievement. The data indicated an increase in suspension days was directly related to a decrease in academic achievement.

Further, in support of this line of research, scholars found student academic achievement to be directly related to positive student discipline (Hyman, 1996; Read & Lampron, 2012).

Studies should that if student behaviors were appropriate, then student achievement was good (Cholewa et al., 2017). If student behaviors were inappropriate, then student achievement was bad (Way, 2011). Further, teachers who used discipline techniques that were age-appropriate and nonpunitive for bad behaviors saw improved student achievement (Atiles et al., 2017).

Student Discipline and Racial Disparities

The literature reviewed showed that disciplinary referrals were often given at a disproportionate rate when comparing racial data (Blomberg, 2003; Bottiani et al., 2016; Gibson & Haight, 2013; Haight et al., 2016; Lee et al., 2011; Mendez et al., 2002; O'Conner et al., 2014; Vanderhaar et al., 2014; Weissman, 2015). Research findings indicated a great concern for the over-representation of minority students regarding the number of discipline referrals compared to White students (Hemphill & Schneider, 2013). Gregory et al. (2018) found that students of color were targeted with discipline issues at an alarming rate compared to their White counterparts. Data revealed by the United States Department of Education's Office for Civil Rights reported that African American children consisted of 18% of the Pre-K population but accounted for 48% of students with multiple suspensions (Martin et al., 2016). The researchers added that students of color were three times more likely to receive exclusionary punishments than their White counterparts. One study explained the nature of the discipline consequences assigned to minority students in every exclusionary and punitive category was overwhelmingly harsh (Stalker, 2018).

Generally, African American students were found three times more likely to be suspended from school than their White schoolmates (Gibson & Haight, 2013). Both quantitative and qualitative techniques were utilized in a study by Mendez et al. (2002) which revealed that exclusionary discipline modes were directed at a disproportionate rate towards minorities, especially Black males. Precisely at the elementary and middle school levels, approximately 12%

of minority students experienced suspensions while 3% of White students experienced the same (Mendez et al., 2002). At the high school level, almost half of the Black male students experienced suspensions compared to only 25% of their White classmates (Mendez et al., 2002).

Further, researchers conducted a multiple-case study analysis involving face-to-face interviews with students, teachers, and guardians (Haight et al., 2016). The researchers revealed a considerable disproportion of minority disciplinary referrals and harsher responses from educators. A study of 64,000 students and 147,000 disciplinary occurrences revealed that African American students were overrepresented in all discipline categories (Vincent et al., 2012).

Student Discipline and Gender

Many of the research studies dedicated to school and student discipline and gender indicated the trend of males more frequently targeted and more likely to receive harsher consequences than females (Haight et al., 2016; Little & Tolbert, 2018; Mendez & Knoff, 2003; Mendez et al., 2002; Morris, 2005; Noltemeyer et al., 2015; Sullivan et al., 2013). In 2005, Morris conducted an ethnographic study over the course of two years using randomized observations and volunteer tutoring sessions to determine disciplinary inconsistencies regarding students' race and gender. Morris's (2005) study revealed that males were treated differently than females with certain rules, especially when a male student wore dress code items considered threatening by an educator.

Sullivan et al. (2013) conducted a study and reviewed relationships between individual students and school traits as they related to student behavior (Sullivan et al., 2013). Using a multinomial logistic regression, the researchers calculated whether certain individual characteristics determined the duration and severity of disciplinary consequences. Sullivan et al.'s (2013) findings revealed that males were more likely to be disciplined (specifically,

suspended) than females. In most cases, a male student was more than twice as likely to be disciplined (Sullivan et al., 2013).

Additional research followed a school for an entire school year (Mendez & Knoff, 2003). Student discipline data were collected for the purpose of reviewing the relationship to gender and race (Mendez & Knoff, 2003). After compilation, student behaviors were compared to the overall discipline numbers to determine percentages by gender and race. Research clearly showed (every race studied) that males were more likely to be disciplined in schools than females (Mendez & Knoff, 2003). For example, the percentage of Black males suspended was 26.23%, and the percentage of Black females suspended was 13.64% (Mendez & Knoff, 2003).

PBIS

PBIS was introduced during the 1980s as researchers at the University of Oregon were studying student discipline and looking for ways to address students with behavior disorders (Sugai & Simonsen, 2012). Researchers revealed the need for educators to be more proactive instead of reactive when addressing student behaviors by using research-based strategies and making data-based decisions (Sugai & Simonsen, 2012). Nonetheless, research has continued for over 30 years with a determination made that all students could have an academic benefit from PBIS (Sugai & Simonsen, 2012).

PBIS includes positive attitudes towards rule teaching and posting, exact teaching and modeling of appropriate student behavior, and constant student supervision (Medina, 2017). Educators must make every effort to teach behaviors without constant negative connotations common in educational settings (Christofferson & Callahan, 2015; Ennis et al., 2018). Way (2011) found that students tended to like school more when teachers respected them and praised them. Medina (2017) pointed out that it is absolutely necessary that educators model the same

behavior that is expected of the students, and educators must remain in constant inspection of student behavior to make every correction (with a positive attitude) as needed.

For appropriate implementation of PBIS, data driven decisions should be made about student discipline just as they are made about students' academic achievement (Christofferson & Callahan, 2015). Feuerborn and Tyre (2012) indicated that when data were used as part of the discipline process, more consistent responses to discipline from teachers and administrators resulted.

Tier System of PBIS

PBIS can be considered a "tiered" discipline process divided into three sections (Averill & Rinaldi, 2011). Tier 1 of PBIS represents a proactive form of PBIS discipline management that is directed at all students before any discipline problems occur (Horner & Sugai, 2009; Lee, 2019). Tier 2 of PBIS is referred to as a more specific mode of discipline that involves more intense, specialized attention to behavior (Horner & Sugai, 2009). Tier 2 is significant in that the educator focuses on the most common misbehaviors, such as talking aloud and being off task (Horner & Sugai, 2009). Corrective educator actions in Tier 2 includes frequent prompting by the teacher, proximity to the problem student, and positive recognition (Lee, 2019). The Tier 3 PBIS component includes the most severe behavior concerns (Lee, 2019). One can recognize this intervention tier by the individualized attention and monitoring given to the behavior (Lee, 2019). PBIS is a mode of discipline that uses positive reinforcement (instead of negative reinforcement) to change behavior, make students feel safer, and improve student achievement in all school areas, including the classrooms, cafeterias, hallways, gyms, playgrounds, and buses (Christofferson & Callahan, 2015; LaSalle et al., 2018).

PBIS and Impact on Discipline

A study by Johnson et al. (2013) involved discipline data before and after the implementation of PBIS. Johnson et al.'s (2013) study suggested that PBIS was instrumental in improving the overall climate of a youth facility and ultimately improved student achievement. The findings showed that student discipline dropped from 46% to 41% (2013). Researchers suggested that much of this improved management was the result of students spending more time in the classroom and less time in the office dealing with discipline issues (Myers et al., 2017). In addition, the researchers offered that PBIS, coupled with sound pedagogical strategies, improved student discipline and academic outcomes (Myers, et al., 2017).

Another study showed that PBIS assisted teachers in improving classroom management, which allowed students more time to remain in class and improve academic outcomes (Gelbar et al., 2015). Their findings revealed that educators used exclusionary discipline responses 59% less than the year prior to implementation of PBIS.

Swain-Bradway et al. (2013) found positive effects on student achievement resulting from improving overall student behavior and teacher responses in disciplinary situations. Their research was conducted involving student and teacher interviews from various schools and residential facilities. The study participants described a calm, error-free environment where students could learn exactly the type of behavior expected. Climate and culture improved in the setting, and as a result, so did academic progress. Offering positive responses to appropriate student behaviors and having a tiered discipline process for student discipline were among the most important topics discussed during the interviews. (2013)

Support for the implementation of PBIS involved research conducted in a rural school district with the focus of the study being early reading indicators and discipline referrals (Sadler

& Sugai, 2009). During the five-year study, a recorded improvement of DIBELS (early reading indicator) scores showed a 5% academic gain in reading in kindergarten and an 11% academic gain in reading in the first grade (Sadler & Sugai, 2009). Similar improvements were mentioned for the third grade. Further, the study authors noted an improvement in office disciplinary referrals with substantially lower discipline rates than comparable schools that did not use PBIS (Sadler & Sugai, 2009).

PBIS and Academic Achievement

Gage et al. (2017) found schools that implemented PBIS with fidelity had statistically significant effects on academic outcomes which allowed students to meet or exceed yearly goals. The researchers included an estimate of a two-year mixed-effects model that compared mathematics and language scores over time with the schools' levels of PBIS implementation. The results of the study indicated that schools that fully implemented PBIS scored higher than schools who did not fully implement PBIS (Gage et al., 2017).

A nine-year study of elementary, middle, and high schools conducted by Madigan et al. (2016) suggested that implementation of PBIS improved academic achievement when compared to their predicted end-of-the-year scores without PBIS implementation and compared to other schools without PBIS implementation. After nine years, this study revealed schoolwide discipline improvements with student academic gains at all school levels from elementary to high school when compared to relative schools and within their own academic predictors prior to PBIS implementation (Madigan et al., 2016). Further, a longitudinal study of over 1,100 schools was conducted to determine the effects of PBIS implementation on students' academic achievement (Childs et al., 2015). In this study, testing data and PBIS implementation were analyzed to determine the relationship between PBIS and student achievement (Childs et al.,

2015). Research indicated that gains were made in student achievement and improvements were made in student discipline (Childs et al., 2015).

Research from a longitudinal group study examined the effects of PBIS implementation on student behavior, academic outcomes, and overall atmosphere of the school (Bradshaw et al., 2010). According to the analysis, the findings revealed a decrease in student office referrals and an increase in student achievement (Bradshaw et al., 2010). Similarly, another study comparing schools that implemented PBIS versus schools that did not implement PBIS showed that after the implementation of PBIS, an academic increase was detected (Bradshaw et al., 2008).

PBIS and Social Learning Theory

PBIS has been referenced as a preventive discipline strategy that promotes a focus on positive administrator, teacher, and student attitudes and behaviors (Bradshaw et al., 2008). Regarding classroom management and student discipline, the response to behavior has traditionally been focused on the single student, and PBIS proposes to be a schoolwide influence (Bradshaw et al., 2008; Bradshaw et al., 2015). Social learning theory dictates that behaviors can be learned through observations and personal experiences (Bandura, 1971). With PBIS, students can learn positive behaviors through observing positive attitudes from teachers and classmates (Bandura, 1971). Based on the social learning theory, teachers lead by example when using PBIS (Hanna et al., 2013).

Further, the social learning theory suggested that behavior is determined by perceived experiences and incentives (Rosenstock et al., 1988). The social learning theory dictates that individuals should be personally responsible for their behaviors based on these perceptions (Manz & Sims, 1980; Rosenstock et al., 1988). Also, a principle of the social learning theory is

that behaviors are learned within a social setting (Chavis, 2011). PBIS creates a positive atmosphere, and positive culture can shape positive student behavior (Chavis, 2011).

PBIS and School Leadership

PBIS implementation and sustainability would not be possible without the complete guidance, support, and commitment from building level leadership (Richards, et al., 2014). For PBIS, the school principal is the "facilitator and catalyst" for positive school climate and should lead all new programs, especially PBIS, by modeling (Richards, et al., 2014). For teachers and students to be successful with PBIS implementation, the academic leader must provide the training and atmosphere needed to give every stakeholder an opportunity for success (Bruhn, Gorsh, & Hanna, 2014).

Chapter Summary

From the research studies reviewed, there is much evidence to suggest that exclusionary and corporal student punishments are inappropriate, inconsistent, and ineffective, both throughout the United States (Alsaif, 2015; Gregory et al., 2014; Vincent, Sprague, & Tobin, 2012). Specifically, the use of exclusionary and corporal punishment were found not to improve behavior (Dupper & Montgomery-Dingus, 2008; Durant & Ensom, 2012; Ferraro & Weinreich, 2006; Gershoff & Bitensky, 2007; Greydanus et al., 2003; Han, 2011; Jambor, 2001).

The related literature provided evidence that student discipline was often dispensed in an inconsistent and unfair way especially by gender and race. Explicitly, minority males were found to be the most common group given consequences for negative behaviors (Bottiani et al., 2016; Brown et al., 2018; Gibson & Haight, 2013; Gregory et al., 2014; Gregory et al., 2018; Haight et al., 2016).

PBIS was introduced and considered as a multitiered discipline process with several components that make it potentially successful (Christofferson & Callahan, 2015; Feuerborn & Tyre, 2012; Horner & Sugai, 2009; Lee, 2019; Medina, 2017; Northeast Foundation for Children, 2009). Several studies indicated the implementation of PBIS improved behavior and student achievement (Atiles et al., 2017; Cholewa et al., 2017; Hyman, 1996; Read & Lampron, 2012; Way, 2011). In particular, Johnson et al. (2013) indicated that the implementation of PBIS improved the overall culture, which, in turn caused a decrease in discipline issues and an increase in academic gains. The school leader plays an important role in the implementation and overall success of PBIS (Richards, et al., 2014).

CHAPTER III

METHODOLOGY

Introduction

This chapter presents the research design and methodology used in the study. A quantitative research design was selected to determine the effects of PBIS on student discipline referrals, ELA scores, and mathematics scores. The chapter includes the following sections: (a) description of the research design and methodology; (b) research questions; (c) research context; (d) an overview of the participants; (e) treatment; (f) data collection procedures; (g) data analysis procedures; and (h) a summary of the research design and methodology.

Description of Research Design and Methodology

The research design selected for this study is a quasi-experimental research design using existing data. The quasi-experimental research design exposes all subjects to a treatment and is known as a before-and-after, pre-test/post-test design (Shaarawy, 2014). The comparison in these designs comes from examining subjects' values on the outcome variable prior to and after the exposure (Alessandri et al., 2017). If posttreatment values differ significantly from pretreatment values, a case can be made that the treatment was the cause of the change (Zieutek et al., 2016).

The treatment for this study was the implementation of PBIS as the preferred method of educator response to student behavior. The dependent variables for this study were the number of office discipline referrals and the ELA and mathematics scores following the implementation of PBIS. The primary purpose of this study was to investigate the effects of the implementation of

PBIS in a school district. The research study proposed to determine whether there was a positive effect on student behavior (lessen the number of discipline referrals) and academic outcomes (improve academic scores) after the implementation of PBIS. First, the research study addressed the number of discipline referrals and academic achievement of students when they were enrolled in the fourth grade before PBIS implementation and when they were enrolled in the fifth grade after implementation of PBIS from the 2011-2012 school year to the 2012-2013 school year. In addition to determining the effect of implementation of PBIS after the first year, the study conducted trend analyses for subsequent years of implementation for fourth and fifth grade students (2012-2019). Correlations were used to determine if there were statistical relationships between the number of discipline referrals and math scores and the number of discipline referrals and ELA academic scores. Correlations were used to determine if positive or negative relationships existed between variables.

Research Questions

The study focused on the effects of the implementation of PBIS. The following research questions guided the study.

1. Are there statistically significant differences by gender and race/ethnicity in the number of disciplinary referrals after the implementation of the first year of PBIS as measured using data for the number of disciplinary office referrals when students were enrolled in the fourth grade before implementation of PBIS and fifth grade after implementation of PBIS (2011-2012 to 2012-2013 school years)?

2. What are the trends by gender and race/ethnicity in the number of disciplinary office referrals, ELA scores, and mathematics scores for fourth- and fifth-grade students after the implementation of PBIS over a seven-year period (2012-2019)?

3. Do relationships exist between the fourth-grade students' number of disciplinary referrals and academic achievement scores and the fifth-grade students' number of disciplinary referrals and academic achievement scores as measured by the end-of-year proficiency exams in ELA one year before implementation and seven years after implementation of PBIS (2012-2019)?

4. Do relationships exist between the fourth-grade students' number of disciplinary referrals and academic achievement scores and the fifth-grade students' number of disciplinary referrals and academic achievement scores as measured by the end-of-the-year proficiency test in math one year before implementation and seven years after implementation of PBIS (2012-2019)?

Treatment

For this study, the treatment was the implementation of PBIS. PBIS was first implemented in the spring of 2012. The implementation of PBIS included staff training and professional development in PBIS throughout the spring and summer of 2012 for the subsequent school year. The school's administration visited schools during the spring of 2012 that had successfully implemented PBIS. These visits included classroom observations and administrative team meetings. During the school's pre-implementation of PBIS, teacher meetings were conducted, and teachers were encouraged to initiate relatively minor discipline adjustments in individual rooms to gauge student reactions and allow the teachers an opportunity to practice.

Administrators conducted continuous classroom observations which included comments and feedback to allow constant conversations at all ranks and levels of expertise to help the teachers fine tune their understanding of implementing PBIS discipline techniques. As a follow-up to the pre-implementation process in the spring of 2012, administrators continued to have meetings in the summer to prepare teachers for the school year. Even though there would be several challenges along the way, teachers were expected to fully implement PBIS at the beginning of the 2012-2013 school year.

As part of full implementation of PBIS, administrators and teachers followed all PBIS guidelines and expectations as studied during professional development the previous year. Teachers focused on positive behaviors instead of negative behaviors following the tiered process of classroom management which includes activities such as proactive lessons, teaching, and management. Also, teachers focused on positive behaviors whenever possible and never group-punished for one child's misbehavior. Administrators made attempts to use nonpunitive consequences when possible instead of punitive.

PBIS training was conducted every year of this study as part of the usual preschool professional development days. For the first several years, all teachers were required to revisit PBIS as if new to the discipline mode. Teachers were provided with presentations, real-world classroom examples, and paperwork necessary to assist them with disciplining students. As the years progressed teachers new to the school or teachers who failed to meet the PBIS expectations of the administration were required to attend training as often as needed. All staff members were observed for quick, specific feedback.

Research Site

The data for the study included information for students enrolled at an elementary school site. Table 1 represents the overall student population from the 2011-2012 to the 2018-2019 school years.

Table 1

Overall Student Population During Years of Study

Year	4th Grade	5th Grade	
2011-12	317	320	Before Implementation of PBIS
2012-13	298	319	After Implementation of PBIS
2013-14	340	296	After Implementation of PBIS
2014-15	355	309	After Implementation of PBIS
2015-16	291	344	After Implementation of PBIS
2016-17	328	286	After Implementation of PBIS
2017-18	301	329	After Implementation of PBIS
2018-19	301	306	After Implementation of PBIS

This research site was chosen because of its convenience for the researcher. Further, a goal of the school was to determine if improvements were being made in the area of student discipline.

Institutional Review Board (IRB) Approval

After approval of the dissertation proposal by the Dissertation Committee, permission to conduct the research study was requested from the Mississippi State University IRB. Upon IRB approval (see Appendix A), the researcher collected existing data for all fourth and fifth grade participants who attended the elementary school in a small rural district. A letter of permission to collect discipline data and end of the year proficiency testing scores in mathematics and ELA for all fourth and fifth grade students from the 2011-2012 school year through the 2018-2019 school year was obtained from the principal and superintendent.

Data Collection Procedures

For this research study, discipline data were collected from the school district's computer program (SWIS) that maintains and compiles discipline data in a real time manner. End-of-the year proficiency scores in ELA and mathematics were collected from the district testing/data specialist for the eight school years of the study. Data were collected for the following school years: 2011-2012, 2012-2013, 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019. The superintendent of schools gave permission for using the existing data. Appendix 2 shows the data variables and statistical procedures used in the study.

Data Analysis Procedures

Once data were received from the school district, the data were coded, and SPSS 25 was used to analyze the data. Preliminary data analysis was conducted to determine if assumptions for the data analysis were met. For the first research question, a paired-samples t-test was conducted to evaluate the extent of the differences each year of the number of office referrals in fourth grade before implementation of PBIS and after implementation of PBIS in fifth grade. Preliminary data analysis using the Levene's test indicated the assumption of normality was violated and did not allow for the one-way repeated measures ANOVA to detect true differences among the population means by gender and/race. For the second research question, descriptive statistics were computed and reported to show the trend Analysis for discipline referrals, ELA scores, and mathematics scores for the seven years following the implementation of PBIS. For the third and fourth research questions, correlations were computed to determine if relationships existed between students' academic achievement and the number of discipline referrals for each year beginning with the 2012-2013 academic year. Correlations were computed for each fourth-grade group and each fifth-grade group.

Summary

Data for study were used from a rural public-school district in Mississippi that included 639 fourth grade students and 667 fifth grade students from the 2011-2012 school year through the 2018-2019 school year. A pretest-posttest research design was utilized to determine the effect of PBIS implementation on discipline referrals for the first year of implementation. Trend Analysis and correlations were completed to determine the effects of the implementation of PBIS on the number of discipline referrals, ELA scores, and mathematics scores. The number of discipline referrals, end-of-the year mathematics proficiency scores, and end-of-the year ELA proficiency scores were compiled, and statistical Analysis were conducted using SPSS to answer the research questions in the study.

CHAPTER IV

PRESENTATION OF RESULTS

Introduction

The purpose of this chapter is to offer the analysis of the data for the research study. The first goal of the study was to determine the effects of PBIS on the number of discipline referrals and academic achievement after the initial implementation of PBIS. Secondly, the study sought to determine trend analysis for the seven years after implementation for fourth and fifth grade students. Discipline referrals, math scores, and ELA scores were analyzed by race and gender to determine if any statistical relationships existed between them.

Data were compiled from the 2011-2012 school year, the year before the implementation of PBIS, and every year following implementation through the 2018-2019 school year.

Research Question One

Are there statistically significant differences by gender and race in the number of discipline referrals after the implementation of the first year of PBIS as measured using data for the number of discipline referrals when students were enrolled in the fourth grade before implementation of PBIS and fifth grade after the implementation of PBIS (2011-2012 to 2012-2013)?

Descriptive Statistics for Research Question 1

Table 2 represents the number of students, means, and standard deviations for the student cohort who received discipline referrals during their fourth-grade year and their fifth-grade year. The data are organized by year before and after implementation of PBIS.

Table 2

Means and Standard Deviations for Number of Discipline Referrals of Fourth Grade Students Before Implementation of PBIS and the Fifth Grade Students After Implementation of PBIS

Year	Grade	N	Mean	SD
2011-12	4	64	2.98	2.92
2012-13	5	64	1.28	1.82

Table 2 indicates the total number of students (n = 64) enrolled in the fourth grade for the 2011-2012 school year who received at least one discipline referral before implementation of PBIS. The same group of students were included in the cohort for fifth grade during the subsequent school year, 2012-2013. There were 64 students enrolled in fourth grade before implementation of PBIS and fifth grade after implementation who had received at least one discipline referral. The mean score for the number of discipline referrals before implementation of PBIS was 2.98, (SD = 2.92) and the mean score after implementation was 1.28 (SD = 1.82). According to Table 2, the mean score for the number of discipline referrals dropped from the 2011-2012 year (before PBIS implementation) to the 2012-2013 year (after PBIS implementation).

Table 3 includes the frequencies, percentages, means, and standard deviations for the students who received discipline referrals by gender and race. Data are shown for the students' fourth-grade year (2011-2012) and their fifth-grade year (2012-2013).

Table 3

Frequencies, Percentages, Means, and Standard Deviations of Students Before and After Implementation of PBIS by Gender and Race

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
11-12	F	14 (22%)	2.93	2.64	4 (6%)	2.25	1.50	18 (28%)	2.78	2.44
	M	28 (44%)	3.21	3.48	18 (28%)	2.83	2.50	46 (72%)	3.07	3.11
Total		42 (66%)	3.07	3.02	22 (34%)	2.54	2.01	64 (100%)	2.98	2.92
12-13	F	14 (22%)	0.86	1.41	4 (6%)	0	.000	18 (28%)	0.67	1.28
	M	28 (44%)	1.82	2.26	18 (28%)	1.06	1.26	46 (72%)	1.52	1.95
Total		42 (66%)	1.77	1.94	22 (34%)	0.53	.625	64 (100%)	1.28	1.82

Table 3 shows most of the students in the cohort were Black (*n*= 42, 66%). Data were included for 22 (34%) White students. The overall mean score for all Black students before implementation of PBIS was 3.07 (*SD*=3.02) and the mean score after implementation was 1.77 (*SD*=1.94). The highest mean score (*M* = 3.21, *SD*=3.48) represented the number of discipline referrals for Black males before implementation of PBIS during the 2011– 2012 school year. The mean score for Black males after implementation of PBIS was 1.82 (*SD*=2.26). The mean score for discipline referrals for Black females before implementation of PBIS was 2.93 (*SD*=2.64) and the mean score was .86 (*SD* =1.41) after implementation of PBIS. The mean score for White

males' discipline referrals before implementation of PBIS was 2.83 (*SD*=2.50) and the mean score after implementation of PBIS was 1.06 (*SD*=1.26). The mean score for White females before implementation of PBIS was 2.25 (*SD*=1.50). There were no discipline referrals for White females during fifth grade after implementation of PBIS. The overall mean score for all White students before implementation of PBIS was 2.54 (*SD*=2.01) and the mean score after implementation was 0.53 (*SD*=.625).

In general, there was a slight decrease in the mean score of the number of discipline referrals for all students after implementation of PBIS. The mean score before implementation of PBIS was 2.98 (*SD*=2.92) and the mean score after implementation of PBIS was 1.28 (*SD*=1.82). Male students had a higher number of discipline referrals than female students. The overall mean score for discipline referrals for all male students before implementation of PBIS was 3.07 (*SD*=3.11) and the mean score after implementation was 1.52 (*SD*=1.95). The overall mean score for discipline referrals for all female students before implementation of PBIS was 2.78 (*SD*=2.48) and the mean score after implementation was .67 (*SD*=1.28).

Data Analysis for Research Question One

A paired samples t-test was conducted to determine if there were differences between the number of discipline referrals for the students while they were in fourth grade before implementation of PBIS and when they were in fifth grade after implementation of PBIS. Table 6 shows the display of the paired samples t-test.

Table 4

Paired Samples T-Test for Students' Mean Scores of Number of Discipline Referrals Before (2011-2012) and After Implementation of PBIS (2012-2013)

	t	**df**	***p***	**Cohen's d**
4th Grade to 5th Grade	5.148	63	<.001	.643

*$p \leq .05$

According to the statistical analysis in Table 4, the overall average referral count per student dropped from the fourth grade to the fifth-grade year. The display shows a statistically significant difference existed ($p < .001$). There was a statistically significant difference between the mean scores of the number of students' discipline referrals during the fourth-grade year (2011-2012) before implementation of PBIS and during the fifth-grade year (2012-2013) after implementation of PBIS. There is a moderate effect size in the statistical analysis (Cohen's d = .643).

Conclusion 1: There was a statistically significant difference in the number of discipline referrals for students from the fourth-grade year (2011-2012) before implementation of PBIS to the fifth-grade year (2012-2013) after implementation of PBIS. There was a slight decrease in the number of discipline referrals after implementation of PBIS.

Conclusion 2: The data did not show statistically significant differences in the number of discipline referrals by gender or by race, however, Black male students and Black female students had higher mean scores for the number of discipline referrals than White male students and White female students before and after implementation of PBIS.

Descriptive Statistics for Research Question Two

What are the trends by gender and race for the fourth and fifth grade students in the number of office discipline referrals, ELA scores, and mathematics scores after the implementation of PBIS during a seven year period (2012-2019)?

Table 5 represents the overall means and standard deviations for fourth grade students discipline referrals. The data are presented from the 2012-2013 school year to the 2018-2019 school year.

Table 5

Trend Analysis for Fourth Grade Students Discipline Referrals After Implementation of PBIS

Year	N	Mean	SD
2012-13	72	2.72	2.20
2013-14	76	2.30	1.96
2014-15	99	3.83	4.39
2015-16	78	2.87	2.57
2016-17	116	2.47	1.82
2017-18	79	3.56	3.42
2018-19	54	3.04	3.53

According to Table 5, the highest mean presented for the number of discipline referrals was for the 2014-2015 school year (M=3.83, SD=4.39). The lowest mean represented for the number of discipline referrals was during the 2013-2014 school year (M=2.30, SD=1.96).

Table 6 includes the means and standard deviations of fourth grade students by gender and race who received at least one discipline referral over the seven-year period (2012-2013 through 2018-2019). The trend analysis is provided from the 2012-2013 school year to the 2018-2019 school year.

Table 6

Trend Analysis with Frequencies, Percentages, Means, and Standard Deviations for Discipline Referrals of Fourth Grade Students After Implementation of PBIS by Gender and Race

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	19 (26%)	2.95	2.37	1 (1%)	1	.00	20 (28%)	2.95	2.31
	M	35 (49%)	3.00	2.43	17 (24%)	1.88	1.27	52 (72%)	2.63	2.17
Total		54 (75%)	2.98	2.38	18 (25%)	1.44	1.26	72 (100%)	2.72	2.20
13-14	F	16 (21%)	2.44	1.99	1 (1%)	1	.00	17 (22%)	2.35	1.97
	M	41 (54%)	2.05	1.50	18 (24%)	2.59	2.62	59 (78%)	2.29	1.97
Total		57 (75%)	2.25	1.65	19 (25%)	1.79	2.57	76 (100%)	2.30	1.96
14-15	F	13 (13%)	3.38	3.23	27 (27%)	3.96	3.95	40 (40%)	3.78	3.70
	M	40 (40%)	3.63	4.27	19 (20%)	4.37	5.97	59 (60%)	3.86	4.84
Total		53 (54%)	3.57	4.01	46 (46%)	4.13	4.82	99 (100%)	3.83	4.39
15-16	F	16 (20%)	3.25	3.36	15 (19%)	2.80	3.01	31 (40%)	3.03	3.15
	M	20 (26%)	2.50	1.82	27 (35%)	2.96	2.36	47 (60%)	2.77	2.14
Total		36 (46%)	2.83	2.60	42 (54%)	2.90	2.57	78 (100%)	2.87	2.57
16-17	F	29 (25%)	2.41	1.50	9 (8%)	1.89	1.05	38 (33%)	2.29	1.41
	M	42 (36%)	2.69	2.12	36 (31%)	2.39	1.83	78 (67%)	2.55	1.99
Total		71 (61%)	2.58	1.89	45 (39%)	2.29	1.70	116 (100%)	2.47	1.82

Table 6 (continued)

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
17-18	F	17 (22%)	2.59	1.50	5 (6%)	1.60	1.34	22 (28%)	2.36	1.50
	M	42 (53%)	4.45	4.05	15 (19%)	2.80	2.86	57 (72%)	4.02	3.82
Total		59 (75%)	3.92	3.60	20 (25%)	2.50	2.59	79 (100%)	3.56	3.42
18-19	F	11 (20%)	2.82	3.25	3 (6%)	1.00	.00	14 (26%)	2.43	2.95
	M	26 (48%)	4.08	4.27	14 (26%)	1.71	1.59	40 (74%)	3.25	3.72
Total		37 (68%)	3.70	3.99	17 (32%)	1.59	1.46	54 (100%)	3.04	3.53

The majority of the fourth-grade students who received discipline referrals during the seven-year period after PBIS implementation were Black (greater than 50%) each year except during the 2015-16 year when there were 56% White students. The highest overall enrollment was during the 2016-17 school year with 116 students. According to Table 6, the highest mean for discipline referrals was represented by Black males during the 2017-2018 school year (M = 4.45, SD = 4.06). The lowest mean was represented by White females during the 2012-2013, 2013-2014, and 2018-2019 school years (M = 1, SD = .00). The data show male students had more discipline referrals than female students each year.

Figure 2 offers a visual representation of the trend analysis for all fourth-grade students. The graph includes data from the 2012-2013 school year to the 2018-2019 school year.

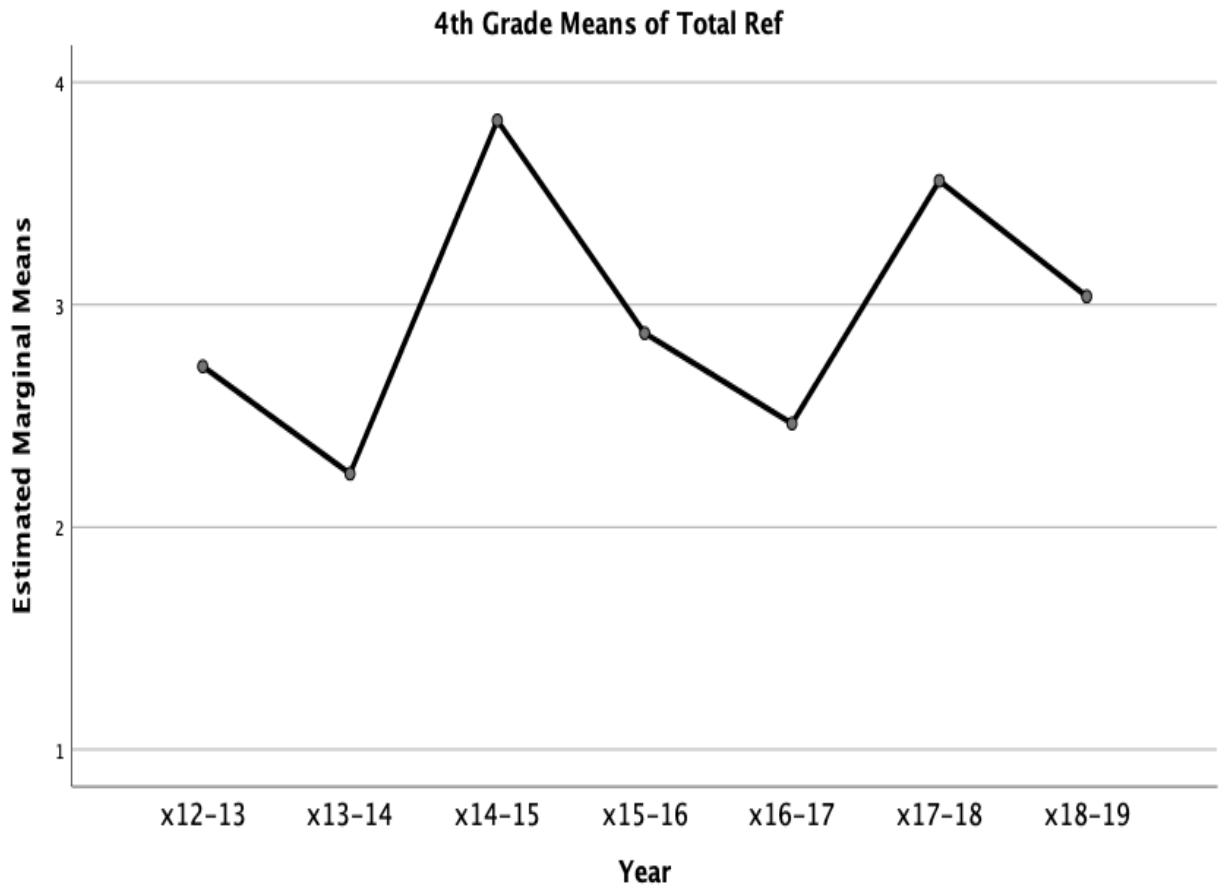

Figure 2. *Trend Analysis for Discipline Referrals for All Fourth Grade Students After Implementation of PBIS 2012-13 through 2018-19*

According to Figure 2, the overall means in discipline referrals for fourth grade students indicated a variety of movement over the seven-year period. The overall lowest number of discipline referrals was during the second year after implementation of PBIS (2013-14). After a high mean for the number of discipline referrals in 2014-2015, there were two years of a downward trend which was followed by second upward turn in 2017-2018.

Conclusion 3: The overall means in discipline referrals for fourth grade students indicated a variety of movement over the seven-year period. The overall lowest number of discipline

referrals was during the second year after implementation of PBIS (2013-14). The number of discipline referrals had its highest peak during the 2014-15 school year.

Figure 3 offers a visual representation of discipline data for fourth grade female students from the 2012-2013 school year to the 2018-2019 school year. The trend analysis is shown by race.

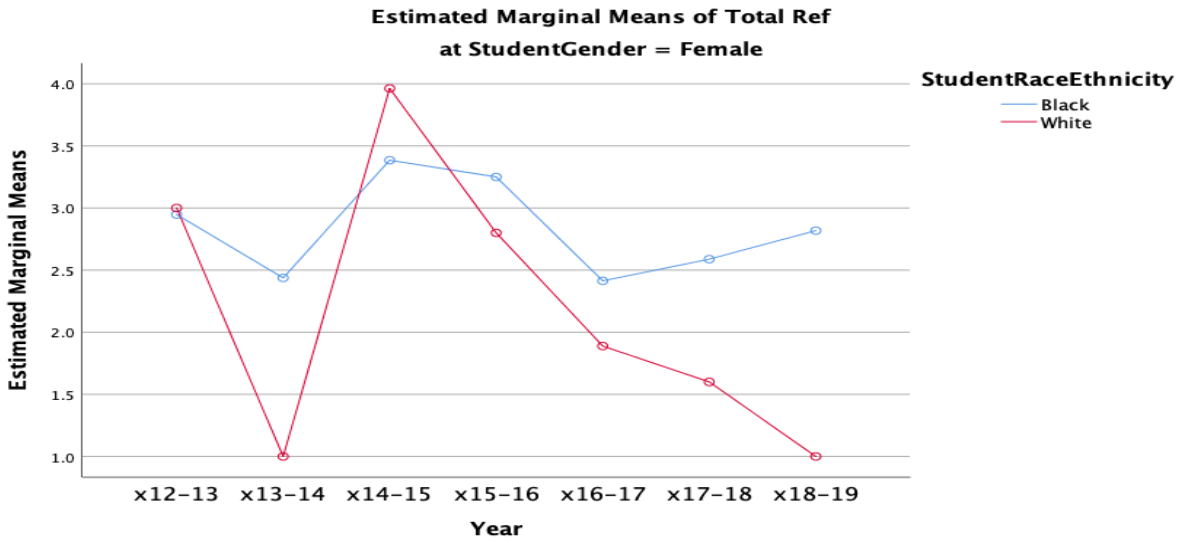

Figure 3. *Trend Analysis for Discipline Referrals for Fourth Grade Female Students from 2012 to 2019*

According to Figure 3, the trend analysis shows Black female students had a higher mean score every year apart from the 2014-2015 school year. White female students represented the highest mean during the 2014-2015 school year. White female students had a remarkably low mean for discipline referrals during the 2013-14 year.

Conclusion 4: Black female students had higher means for the number of discipline referrals than White female students every year of the study except for the 2014-2015 school

year. During the 2014-2015 school year, White female students had a higher mean for the number of discipline referrals than Black female students.

Figure 4 represents the trend analysis for overall mean scores for the number of discipline referrals for fourth grade male students from the 2012-2013 school year to the 2018-2019 school year. The Trend Analysis data are displayed by race.

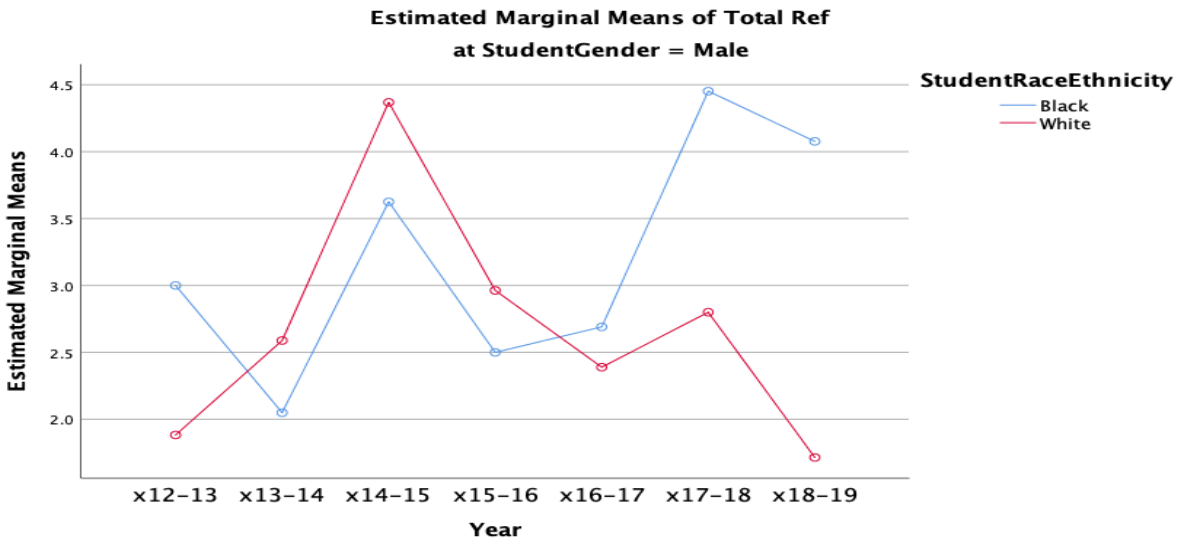

Figure 4. *Trend for Discipline Referrals for Fourth Grade Male Students from 2012-2019*

According to Figure 4, Black male students had a higher mean score in discipline referrals than White male students for four of the seven years (2012-2013, 2016-2017, 2017-2018, 2018-2019). From the 2017-2018 to the 2018-2019 school year, both White and Black male students dropped in mean score for the number of discipline referrals after a considerable increase the previous year. Considerable increases were observed in the mean scores for the number of discipline referrals for Black male students from 2017 through 2019, while at the

same time there were large decreases in the mean scores for the number of discipline referrals for White male students.

Conclusion 5: Black male students presented higher mean scores for the number of discipline referrals than White male students for four of the seven years of the study. Steep increases in the means for discipline referrals occurred for both groups during the 2014-2015 year and for Black male students during the 2017-2018 and 2018-2019 school years.

Table 7 represents overall mean scores and standard deviations for fifth grade students following PBIS implementation. The data are represented from the 2012-2013 school year to the 2018-2019 school year.

Table 7

Overall Means and Standard Deviations of Discipline Referrals for Fifth Grade Students After Implementation of PBIS

Year	**N**	**Mean**	**SD**
2012-13	69	2.14	1.71
2013-14	80	3.60	3.42
2014-15	88	2.83	2.42
2015-16	86	3.28	4.21
2016-17	105	3.31	3.53
2017-18	109	3.13	2.98
2018-19	79	2.84	3.11

According to Table 7, the highest mean for the number of discipline referrals was represented during the 2013-2014 school year (*M*=3.60, *SD*=3.42). The lowest mean for the number of discipline referrals was represented during the 2012-2013 school year (*M*=2.14, *SD*=1.71).

Table 8 indicates the means and standard deviations of fifth grade students who received at least one discipline referral after implementation of PBIS. The trend analysis is shown by gender and race.

Table 8

Trend Analysis with Frequencies, Percentages, Means, and Standard Deviations for Discipline Referrals of Fifth Grade Students After Implementation of PBIS by Gender and Race

		Black			**White**			**Overall Total**		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	8 (12%)	1.88	1.36	3 (4%)	1.33	.58	11 (16%)	1.73	1.19
	M	38 (56%)	2.26	1.74	19 (28%)	1.58	.91	57 (84%)	2.35	1.67
Total		46 (68%)	2.20	1.67	22 (32%)	1.55	.86	68 (100%)	2.14	1.71
13-14	F	23 (29%)	3.61	3.09	3 (4%)	1.33	.58	26 (33%)	3.35	2.99
	M	39 (49%)	3.97	3.66	15 (18%)	3.07	3.60	54 (67%)	3.60	3.42
Total		62 (78%)	3.84	3.44	18 (22%)	2.78	3.34	80 (100%)	3.60	3.42
14-15	F	17 (20%)	3.00	3.02	15 (17%)	1.80	1.01	32 (37%)	2.44	2.36
	M	35 (40%)	3.34	2.69	20 (23%)	2.65	1.96	55 (63%)	3.05	2.45
Total		52 (60%)	3.23	2.78	35 (40%)	2.29	1.66	87 (100%)	2.83	2.42
15-16	F	12 (14%)	2.25	1.14	17 (20%)	5.41	7.73	29 (34%)	4.10	6.10
	M	36 (42%)	3.11	3.20	21 (24%)	2.43	1.91	57 (66%)	2.86	2.79
Total		48 (56%)	2.90	2.84	38 (44%)	3.76	5.48	86 (100%)	3.28	4.21

Table 8 (continued)

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
16-17	F	26 (25%)	2.27	1.64	13 (12%)	2.46	2.54	39 (37%)	2.33	1.95
	M	40 (38%)	4.97	4.75	26 (25%)	2.23	1.96	66 (63%)	3.89	4.10
Total		66 (63%)	3.91	4.05	39 (37%)	2.31	2.13	105 (100%)	3.31	3.53
17-18	F	27 (25%)	2.41	2.49	6 (5%)	1.50	1.23	33 (30%)	2.24	2.32
	M	51 (47%)	3.88	3.41	25 (23%)	2.76	2.51	76 (70%)	3.51	3.16
Total		78 (72%)	3.37	3.18	31 (28%)	2.52	2.35	109 (100%)	3.13	2.98
18-19	F	19 (24%)	2.16	2.50	6 (8%)	1.50	.837	25 (32%)	2.00	2.95
	M	37 (47%)	3.65	3.903	17 (21%)	2.29	1.57	54 (68%)	3.22	3.39
Total		56 (71%)	3.14	3.539	23 (29%)	2.09	1.443	79 (100%)	2.84	3.11

According to Table 8, the highest mean represented from the 2013-2014 school year to the 2018-19 school year for fifth grade students discipline referrals was for Black male students during the 2016-2017 school year ($M = 4.97$, $SD = 4.75$). The lowest mean represented for fifth grade students discipline referrals was for White female students during the 2012-2013 school year ($M = 1.33$, $SD = .58$).

Figure 5 indicates a visual representation of the trend analysis for discipline referrals for all fifth-grade students. The data were included for the 2012-2013 school year to the 2018-2019 school year.

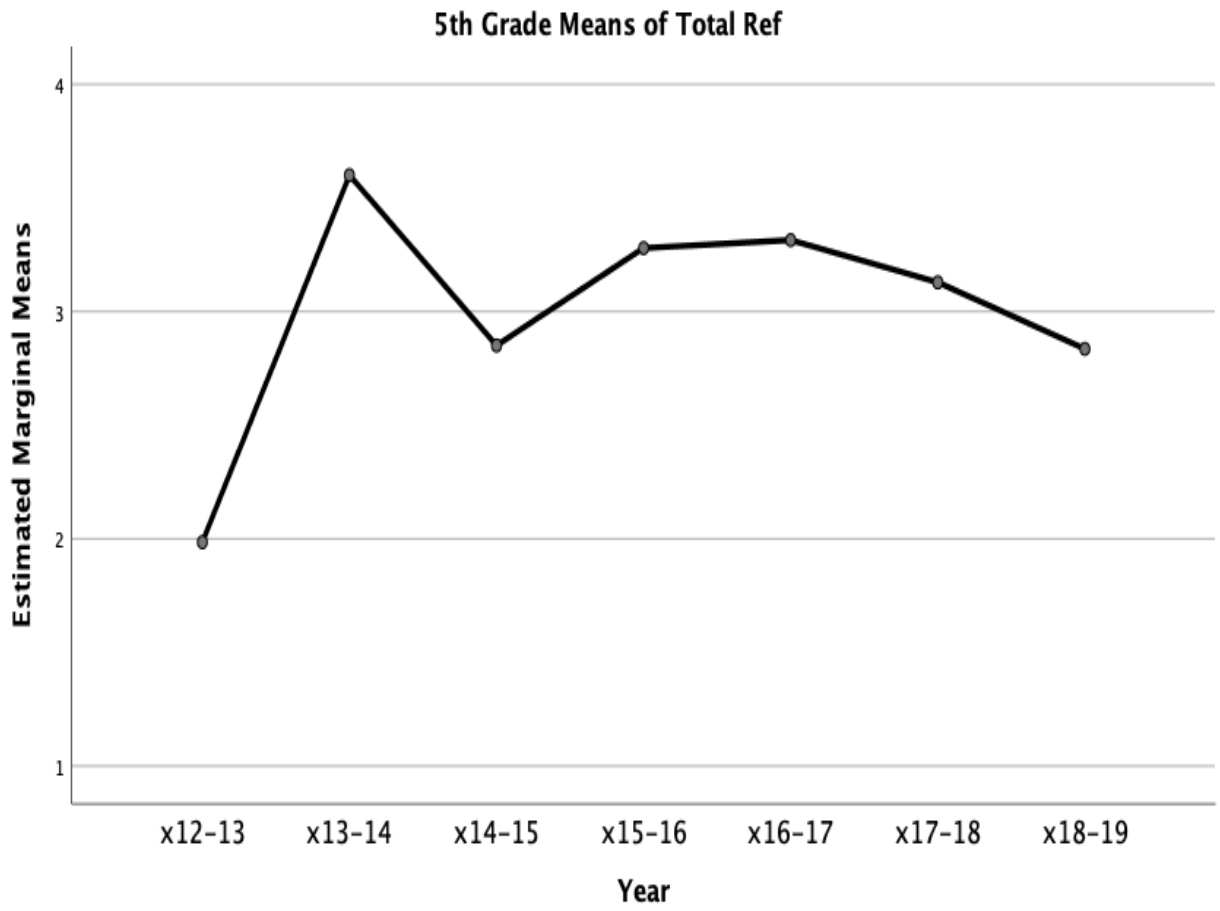

Figure 5. *Trend Analysis for Discipline Referrals for All Fifth Grade Students*

The first year of PBIS implementation showed the lowest overall mean for discipline referrals during the seven-year period. According to Figure 5, the highest mean for discipline referrals for fifth grade students occurred in 2013-2014 which was followed by a considerable drop in 2014-2015. After two years of leveling off, a decline in discipline referrals occurred during the 2017-2018 and 2018-2019 school years.

Conclusion 6: The lowest mean for the number of discipline referrals for fifth grade students was during the first year of implementation (2012-2013), and the highest mean for the

number of discipline referrals was during the 2015-2016 school year followed by slight decreases during subsequent years.

Figure 6 indicates the trend analysis for fifth grade female students from the 2012-13 school year to the 2018-2019 school year. The data are displayed by race.

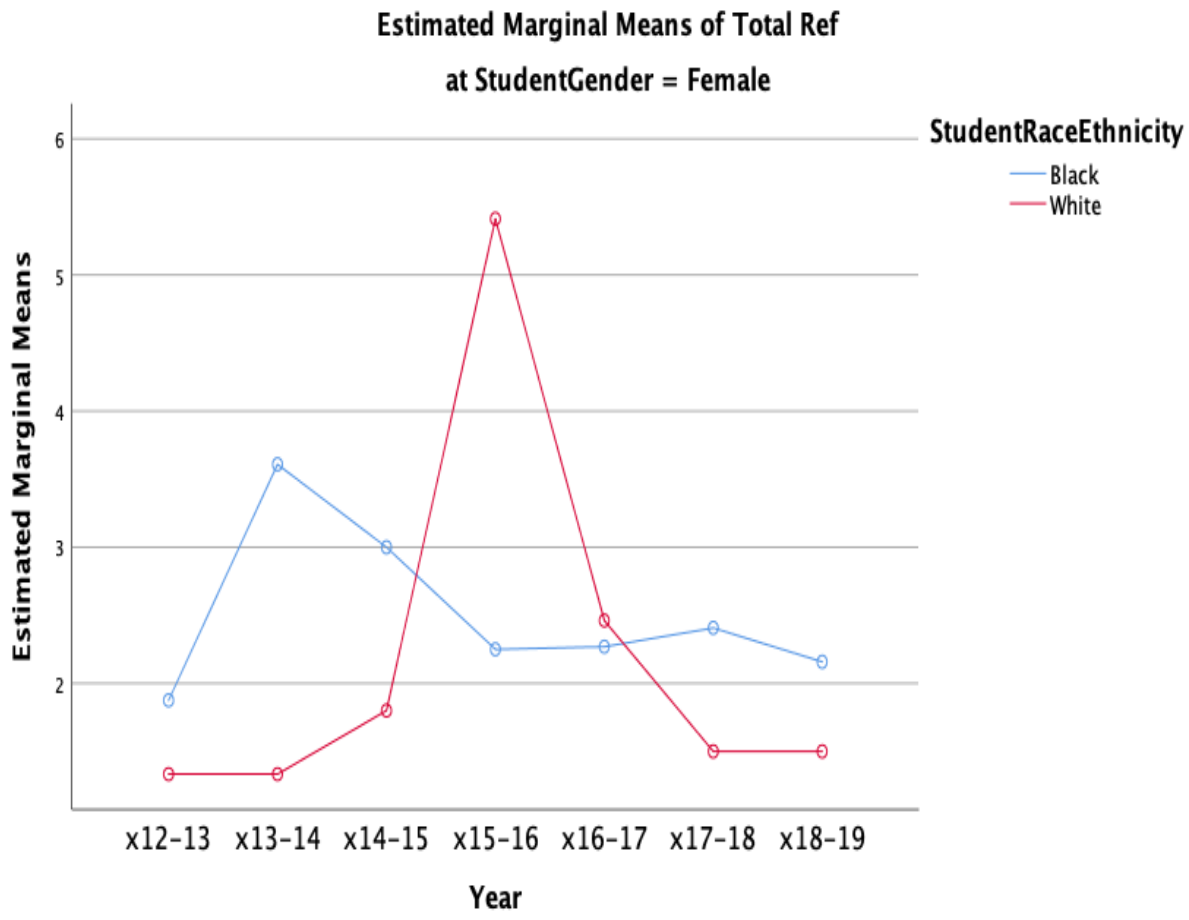

Figure 6. *Trend Analysis for Discipline Referrals for Fifth Grade Female Students from 2012 to 2019*

According to Figure 6, Black female students represented a higher mean score for discipline referrals than White female students for four years of the study (2012-2013, 2013-2014, 2014-2015, 2017-2018, 2018-2019). Strikingly, there was a dramatic increase in the mean score for discipline referrals for White female students during the 2015-2016 school year.

Conclusion 7: With the exception of the 2015-2016 and 2016-2017 school years, Black females had high mean scores for the number of discipline referrals than White females every year of the study.

Figure 7 offers a visual representation of discipline trend analysis for fifth grade male students from the 2012-2013 school year to the 2018-2019 school year. The trend analysis is shown by race.

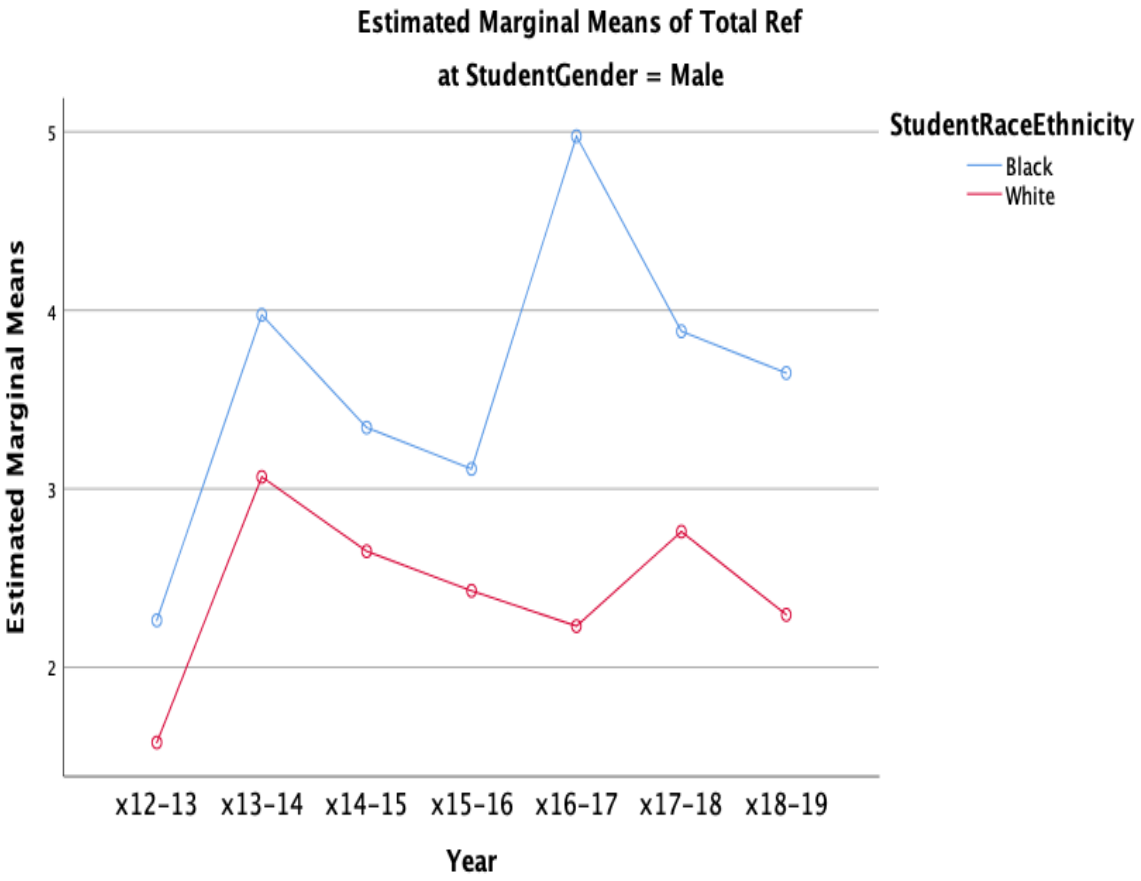

Figure 7. *Trend Analysis for Discipline Referrals for Male Students from 2012-2019*

According to the trend analysis in Figure 7, Black male students represented a higher mean score for discipline referrals than White male students every year over the seven-year period. A dramatic increase in the mean number of discipline referrals for Black male students occurred during the 2016-2017 school year.

Conclusion 8: Black male students had higher means for the number of discipline referrals than White male students every year of the study. There was a considerable increase in the mean for the number of discipline referrals for Black male students during the 2016-2017 school year.

Table 9 indicates the means and standard deviations for ELA scores for the entirety of the study. During the first two years, ELA mean scores ranged from a mean of 144.75 (*SD*=11.57) to a mean of 147.83 (*SD*=11.05). During the remaining years, the ELA scores ranged from a mean of 448.67 (*SD*=92.08) during the 2018-19 year to a mean of 469.81 (*SD*=40.21) during the 2014-15 year. The data are displayed by school year.

Table 9

Overall Means and Standard Deviations of ELA Scores for Fourth Grade Students from the 2012-2013 School Year to the 2018-2019 School Year

Year	N	Mean	SD
2012-13	72	147.83	11.05
2013-14	76	144.75	11.57
2014-15	99	469.81	40.21
2015-16	78	460.40	32.70
2016-17	116	455.57	34.23
2017-18	79	461.34	17.81
2018-19	54	448.67	92.08

According to Table 9, from the 2012-2013 school year to the 2013-2014 school year, the highest mean was represented during the 2012-2013 school year (M = 147.83, SD = 11.05), the first year of the implementation of PBIS. From the 2014-2015 school year to the 2018-2019 school year, the highest mean represented was during the 2014-2015 school year (M = 469.81, SD = 40.21), the third year of the implementation of PBIS.

Table 10 provides a display of descriptive statistics for ELA scores for fourth grade students after PBIS implementation. Included in this table are means and standard deviations. Data are provided by gender and race. As stated earlier, trend analysis for the first two years of the study were different from the remaining five years because of the change in scoring of the assessment.

Table 10

Frequencies, Percentages, Means, and Standard Deviations of ELA Scores of Fourth Grade Students After Implementation of PBIS by Gender and Race

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	19 (26%)	148.58	8.24	1 (1%)	143.00	.00	20 (28%)	148.30	8.11
	M	35 (49%)	145.94	12.39	17 (24%)	151.18	10.84	52 (72%)	147.65	12.06
Total		54 (75%)	146.87	11.10	18 (25%)	150.72	10.69	72 (100%)	147.83	11.05
13-14	F	16 (21%)	145.56	6.83	1 (1%)	133.00	.00	17 (22%)	144.82	7.28
	M	41 (54%)	146.02	10.57	18 (24%)	143.76	14.32	59 (78%)	144.73	12.58
Total		57 (75%)	145.89	9.61	19 (25%)	138.38	14.13	76 (100%)	144.75	11.57
14-15	F	13 (13%)	470.54	27.97	27 (27%)	473.33	21.17	40 (40%)	472.43	23.27
	M	40 (40%)	463.78	53.05	19 (20%)	477.00	37.21	59 (60%)	468.03	48.59
Total		53 (54%)	465.43	47.95	46 (46%)	474.85	28.57	99 (100%)	469.81	40.21
15-16	F	16 (20%)	455.81	17.30	15 (19%)	463.33	32.77	31 (40%)	459.71	25.83
	M	20 (26%)	459.15	48.34	27 (35%)	462.11	26.15	47 (60%)	460.85	36.79
Total		36 (46%)	457.67	37.41	42 (54%)	462.74	28.30	78 (100%)	460.40	32.70
16-17	F	29 (25%)	448.86	14.68	9 (8%)	463.87	18.99	38 (33%)	452.37	13.65
	M	42 (36%)	452.40	51.70	36 (31%)	463.11	20.91	78 (67%)	457.13	40.66
Total		71 (61%)	450.72	40.05	45 (39%)	463.22	20.32	116 (100%)	455.57	34.23
17-18	F	17 (22%)	458.29	14.68	5 (6%)	458.60	15.24	22 (28%)	458.36	14.43
	M	42 (53%)	462.40	20.11	15 (19%)	462.73	15.84	57 (72%)	462.49	18.94
Total		59 (75%)	461.22	18.68	20 (25%)	461.70	15.40	79 (100%)	461.34	17.81
18-19	F	11 (20%)	416.82	142.71	3 (6%)	477.00	16.37	14 (26%)	429.71	127.92
	M	26 (48%)	447.58	93.54	14 (26%)	469.64	22.75	40 (74%)	455.30	76.78
Total		37 (68%)	438.43	109.93	17 (32%)	470.94	21.50	54 (100%)	448.67	92.08

Table 10 shows that from the 2012-2013 and 2013-2014 school years, the highest mean score for the ELA exam represented was for White male students (M = 151.18, SD = 10.84), and the lowest mean ELA exam mean score represented was for White female students (M = 133.00, SD = .00). From the 2014-2015 to the 2018-2019 school years, the highest mean represented (on two separate occasions) was for White male students in 2014-2015 (M = 477.00, SD = 37.21) and White female students in 2018-2019 (M = 477.00, SD = 16.37). The lowest mean was represented by Black female students during the 2018-19 year (M = 416.82, SD = 142.71).

Figure 8 provides a visual representation of the Trend Analysis for ELA scores for all fourth-grade students. The figure shows trend analysis for the 2012-2013 school year through the 2018-2019 school year.

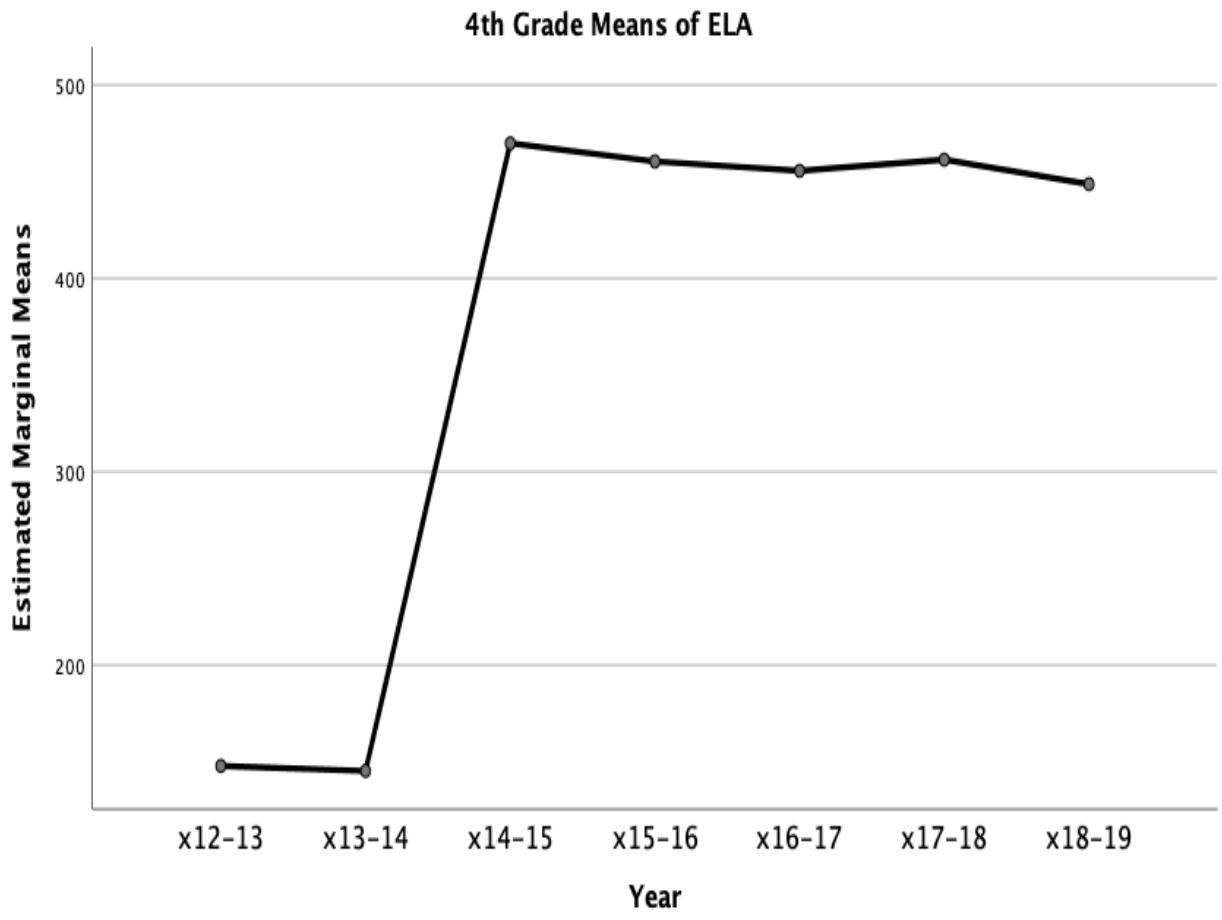

Figure 8. *Trend Analysis for Overall ELA Scores for All Fourth Grade Students After Implementation of PBIS*

According to Figure 8, from the 2012-2013 school year to the 2013-2014 school year, the trend analysis for overall fourth grade ELA mean scores dropped slightly. From the 2014-2015 school year to the 2018-2019 school year, there was a slight downward trend every year except for the 2017-2018 school year where a slight upward trend was noted.

Conclusion 9: From the 2014-2015 school year to the 2018-2019 school year after implementation of PBIS, for fourth grade students there was a slight downward trend for ELA

mean scores every year except for the 2017-2018 school year where a slight upward trend was noted.

Figure 9 represents the mean scores for fourth grade female students ELA scores from the 2012-2013 school year to the 2018-2019 school year. The trend analysis is shown by race.

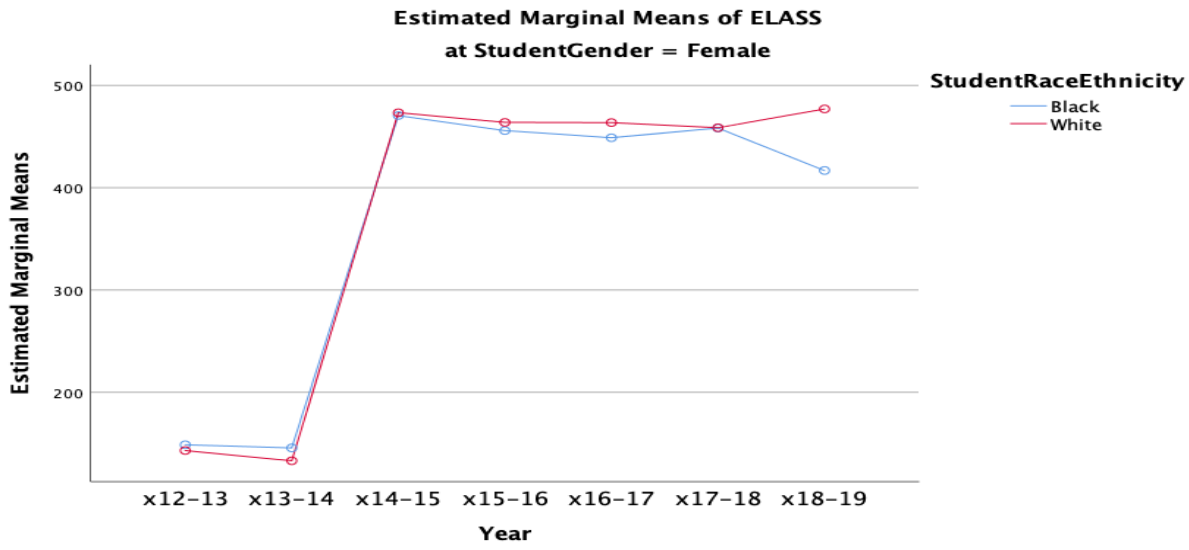

Figure 9. *Trend Analysis for ELA Mean Scores for Fourth Grade Female Students After Implementation of PBIS*

According to the trend analysis in Figure 9, from the 2012-2013 school year to the 2013-2014 school year, ELA mean scores for Black female students were slightly higher than the ELA mean scores for White female students. From the 2014-2015 school year to the 2017-2018 school year, there were slightly higher ELA mean scores for White female students than for Black female students. During the 2018-2019 school year, Black female students had a downward trend in their ELA scores while White female students had a slightly upward trend.

Conclusion 10: After PBIS implementation, fourth grade Black female students had a slightly higher ELA mean score than White female students during the 2012-2013 and 2013-2014 school years. Fourth grade White female students had slightly higher ELA mean scores than Black female students during the 2014 to the 2017-2018 school years and a somewhat higher increase during the 2018-2019 school year.

Figure 10 represents trend analysis for mean ELA scores for fourth grade male students from the 2012-2013 school year to the 2018-2019 school year. The trend analysis for ELA scores are displayed by race.

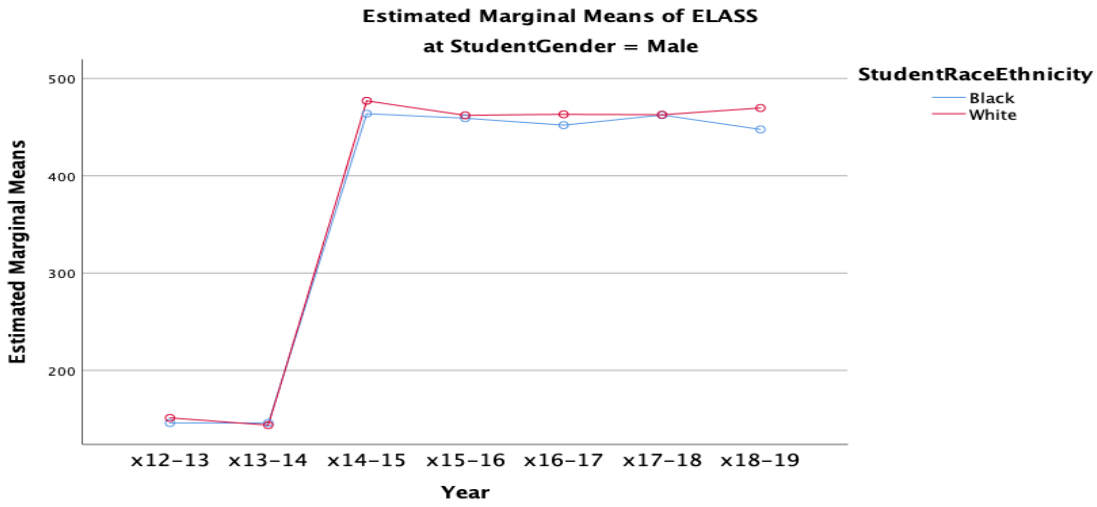

Figure 10. *Trend Analysis for ELA Mean Scores for Fourth Grade Male Students After Implementation of PBIS*

According to Figure 10, there were only slight differences in the ELA scores for fourth-grade male students from 2012-2013 to 2017-2018. However, during the 2018-19 school year, the ELA scores for White male students were slightly higher than those for Black male students.

Conclusion 11: For fourth grade students, White male student had slightly higher ELA mean scores than Black male students in every year of the study with a noticeable higher ELA mean score during the 2018-2019 school year.

Table 11 includes the trend analysis of fifth grade students ELA scores after implementation of PBIS. The means and standard deviations of fifth grade students ELA scores from the 2011-2012 school year to the 2018-2019 school year are provided.

Table 11

Overall Means and Standard Deviations of ELA Scores for Fifth Grade Students After Implementation of PBIS

Year	**N**	**Mean**	**SD**
2012-13	69	144.65	9.63
2013-14	80	146.74	10.55
2014-15	88	558.09	30.41
2015-16	86	561.48	37.73
2016-17	105	551.83	29.91
2017-18	109	555.10	16.66
2018-19	79	562.06	17.18

According to Table 11, the highest ELA mean score for fifth grade students during the first two years of the study occurred during the 2013-2014 school year (M=146.74). The highest ELA mean score for fifth grade students during the last five years of the study occurred during the 2018-2019 school year (M=562.06).

Table 12 indicates the frequencies, percentages, means, and standard deviations of ELA scores for fifth grade students after implementation of PBIS. These data are represented from the 2012-2013 school year to the 2018-2019 school year.

Table 12

Frequencies, Percentages, Means, and Standard Deviations of ELA Scores for Fifth Grade Students After Implementation of PBIS by Gender and Race

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	8 (12%)	148.88	12.15	3 (4%)	141.67	8.51	11 (16%)	142.55	10.89
	M	38 (56%)	145.05	9.56	19 (28%)	145.32	9.59	57 (84%)	145.05	9.42
Total		46 (68%)	144.67	9.94	22 (32%)	144.82	9.35	68 (100%)	144.65	9.63
13-14	F	23 (29%)	147.84	9.16	3 (4%)	156.00	20.08	26 (33%)	148.69	10.64
	M	39 (49%)	143.54	9.26	15 (18%)	151.67	11.48	54 (67%)	145.80	10.48
Total		62 (78%)	145.10	9.37	18 (22%)	152.39	12.59	80 (100%)	146.74	10.55
14-15	F	17 (20%)	555.41	26.67	15 (17%)	572.80	21.23	32 (37%)	563.56	25.46
	M	35 (40%)	549.20	36.44	20 (23%)	565.30	23.36	55 (63%)	554.96	32.71
Total		52 (60%)	551.23	33.42	35 (40%)	568.51	22.46	87 (100%)	558.09	30.41
15-16	F	12 (14%)	558.75	13.16	17 (20%)	564.82	12.52	29 (34%)	562.31	12.92
	M	36 (42%)	558.33	54.01	21 (24%)	565.71	25.99	57 (66%)	561.05	45.57
Total		48 (56%)	558.44	47.04	38 (44%)	565.32	20.81	86 (100%)	561.48	37.73
16-17	F	26 (25%)	534.85	40.09	13 (12%)	563.00	17.13	39 (37%)	544.23	36.48
	M	40 (38%)	550.05	26.62	26 (25%)	565.96	17.03	66 (63%)	556.32	24.45
Total		66 (63%)	544.06	33.16	39 (37%)	564.97	16.89	105 (100%)	551.83	29.91
17-18	F	27 (25%)	552.96	12.46	6 (5%)	562.67	12.80	33 (30%)	554.73	12.89
	M	51 (47%)	551.55	14.05	25 (23%)	562.84	22.96	76 (70%)	555.26	18.13

Table 12 (continued)

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
Total		78 (72%)	552.04	13.45	31 (28%)	562.81	21.19	109 (100%)	555.10	16.66
18-19	F	19 (24%)	557.37	12.36	6 (8%)	573.00	7.13	25 (32%)	561.12	13.10
	M	37 (47%)	561.62	12.21	17 (21%)	564.41	28.97	54 (68%)	562.50	18.88
Total		56 (71%)	560.18	12.31	23 (29%)	566.65	25.23	79 (100%)	562.06	17.18

According to Table 12, from the 2012-2013 school year to the 2013-2014 school year after implementation of PBIS, White female students were represented with the highest ELA mean score during the 2012-2013 school year (M = 156.00, SD = 20.08). In addition, the lowest mean was represented by White female students during the 2013-2014 school year (M = 141.67, SD = 8.51). From the 2014-2015 school year to the 2018-2019 school year, the highest mean was represented by White females during the 2018-2019 school year (M = 573.00, SD = 7.13), and the lowest mean was represented by Black females during the 2016-2017 school year (M = 534.85, SD = 40.09).

Figure 11 provides a visual representation of the trend analysis for ELA scores for all fifth-grade students. The illustration shows the trend analysis for the seven years after implementation of PBIS.

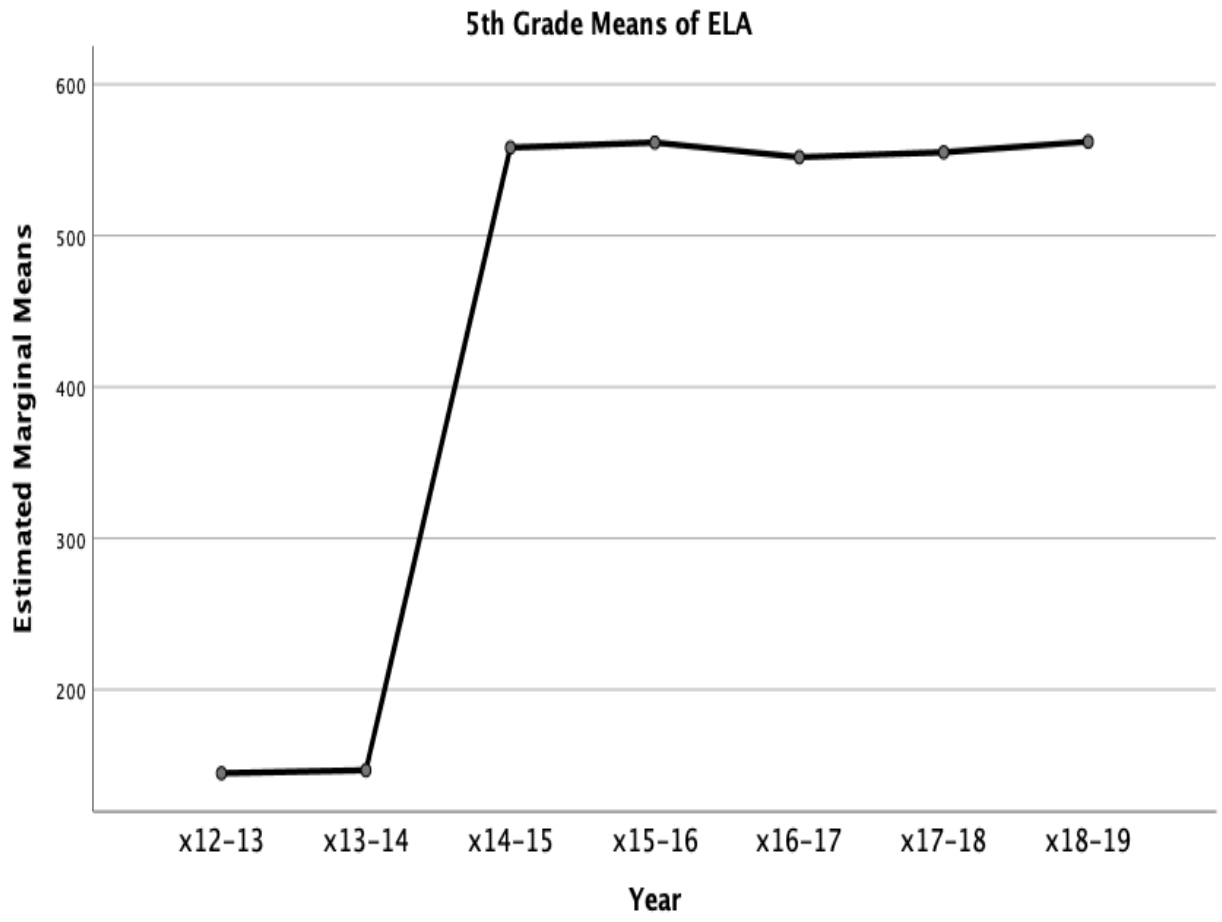

Figure 11. *Trend Analysis for ELA Scores for All Fifth Grade Students After Implementation of PBIS*

According to Figure 11, from the 2012-2013 school year to the 2013-2014 school year, there was little difference in the ELA mean scores of the fifth-grade students. From the 2014-2015 school year to the 2018-2019 school year, a very stable trend was indicated every year except for a slight downward trend during the 2016-2017 school year.

Conclusion 12: After implementation of PBIS, there was a very stable trend every year for fifth grade students ELA mean scores with a slight downward trend during the 2016-17 school year.

Figure 12 indicates a visual representation of the trend analysis for fifth-grade female students' ELA mean scores from the 2012-2013 school year to the 2018-2019 school year. The trend analysis data are categorized by race.

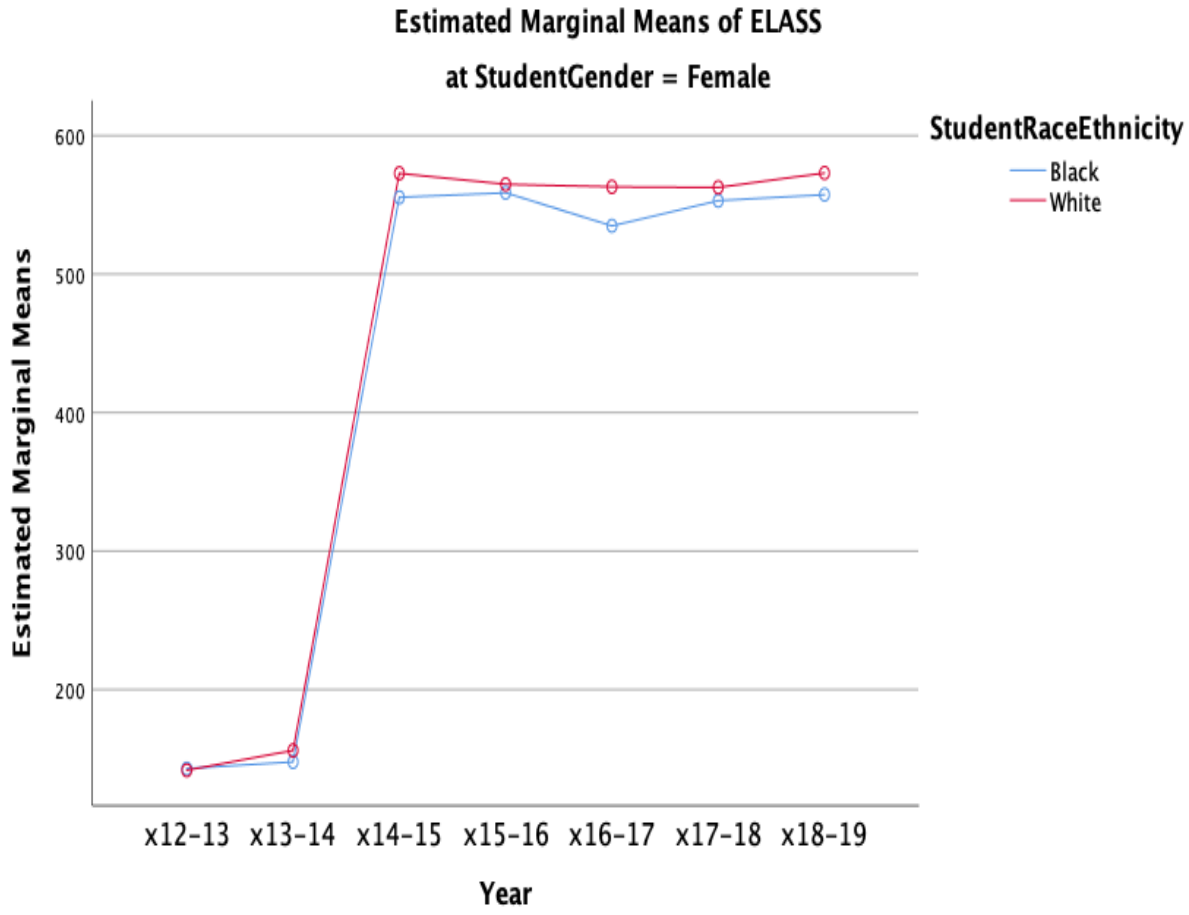

Figure 12. *Trend Analysis for Fifth Grade Female Students ELA Scores from 2012-2013 School Year to the 2018-2019 School Year*

According to the trend analysis in Figure 12, the ELA mean scores for White female students was higher than Black female students every year with almost no exception. For the 2016-2017 school year, there was a noticeable downward trend for Black female students.

Conclusion 13: After implementation of PBIS, the ELA mean scores for fifth grade White female students was higher than the ELA mean scores of fifth grade Black female students every year during the seven-year period.

Figure 13 represents the trend analysis of the mean ELA scores for fifth grade male students. The trend analysis is displayed by race.

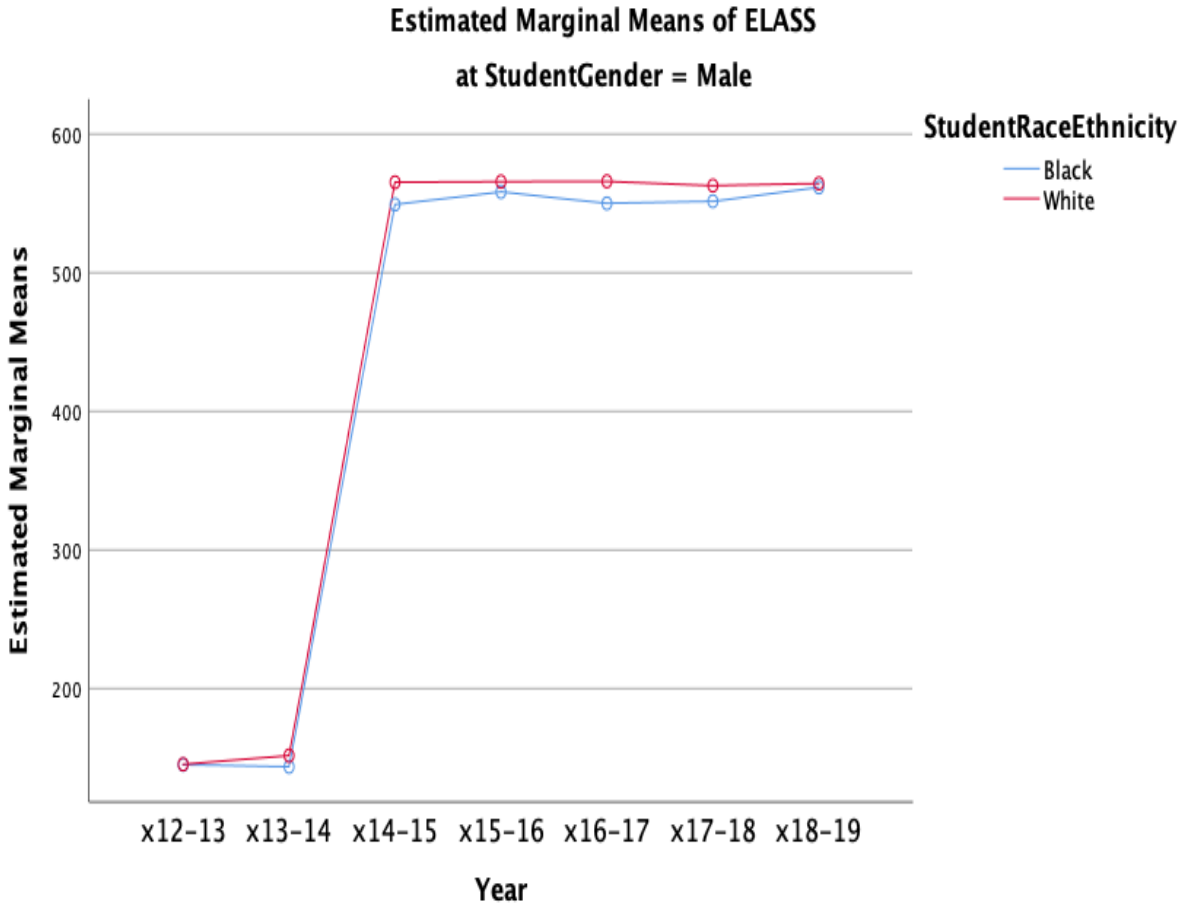

Figure 13. *Trend Analysis for Fifth Grade Male Students ELA Mean Scores After Implementation of PBIS*

According to the trend analysis in Figure 13, the ELA mean scores for fifth-grade White male students and Black male students were somewhat stable every year after implementation of PBIS. The fifth-grade White male students had slightly higher ELA mean scores than the fifth-grade Black students each year during the seven-year period.

Conclusion 14: After implementation of PBIS, the ELA mean scores for fifth grade White male students was slightly higher than the ELA mean scores of fifth grade Black male students every year during the seven-year period.

Table 13 represents the descriptive statistics for fourth-grade mathematics scores from the 2012-2013 school year to the 2018-2019 school year. Included in this table are means and standard deviations of scores for math scores.

Table 13

Fourth Grade Descriptive Statistics for Math Mean Scores

Year	**N**	**Mean**	**SD**
2012-13	72	152.11	9.604
2013-14	76	149.38	11.18
2014-15	99	471.31	39.33
2015-16	78	469.69	31.36
2016-17	116	465.26	35.95
2017-18	79	469.90	17.24
2018-19	54	453.35	92.69

Table 13 shows the mean score for math (*M*=152.11, *SD*=9.60) was slightly higher during the first year of PBIS implementation than the second year after implementation (*M*=149.38, *SD*=11.18) for fourth grade students. In addition, Table 13 indicated within the last five years that the highest mean score for fourth grade students' math was for the 2014-2015 school year (*M* = 471.31, *SD* = 39.33) and the lowest mean score for mathematics was for the 2018-2019 school year (*M* = 453.35, *SD* = 92.69).

Table 14 indicates frequencies, percentages, means, and standard deviations of math scores for fourth grade students from the 2012-2013 school year through the 2018-2019 school year. The trend analysis data are provided by gender and race.

Table 14

Frequencies, Percentages, Means, and Standard Deviations for Mathematics of Fourth Grade Students after Implementation of PBIS by Gender and Race

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	19 (26%)	149.74	10.09	1 (1%)	155.00		20 (28%)	150.00	9.89
	M	35 (49%)	152.43	10.33	17 (24%)	153.94	7.57	52 (72%)	152.92	9.46
Total		54 (75%)	151.48	10.23	18 (25%)	154.00	7.35	72 (100%)	152.11	9.60
13-14	F	16 (21%)	145.75	11.45	1 (1%)	146.00		17 (22%)	145.76	11.08
	M	41 (54%)	149.80	10.68	18 (24%)	152.53	12.13	59 (28%)	150.42	11.08
Total		57 (75%)	148.67	10.95	19 (25%)	152.17	11.86	76 (100%)	149.38	11.18
14-15	F	13 (13%)	471.38	32.35	27 (27%)	470.81	22.81	40 (40%)	471.00	25.86
	M	40 (40%)	467.40	50.86	19 (20%)	480.21	35.31	59 (60%)	471.53	46.52
Total		53 (54%)	468.38	46.74	46 (46%)	474.70	28.70	99 (100%)	471.31	39.33
15-16	F	16 (20%)	459.94	15.70	15 (19%)	468.53	31.93	31 (40%)	464.10	24.86

Table 14 (continued)

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
	M	20 (26%)	472.05	45.33	27 (35%)	474.37	25.18	47 (60%)	473.38	34.73
Total		36 (46%)	466.67	35.47	42 (54%)	472.29	27.54	78 (100%)	469.69	31.36
16-17	F	29 (25%)	452.48	12.41	9 (8%)	471.56	17.68	38 (33%)	457.00	15.86
	M	42 (36%)	465.36	53.64	36 (31%)	473.86	21.47	78 (67%)	469.28	41.95
Total		71 (61%)	460.10	42.28	45 (39%)	473.40	20.60	116 (100%)	465.26	35.95
17-18	F	17 (22%)	461.24	10.28	5 (6%)	467.60	14.15	22 (28%)	462.68	11.23
	M	42 (53%)	469.52	19.32	15 (19%)	471.00	17.66	57 (72%)	469.91	18.75
Total		59 (75%)	467.14	17.53	20 (25%)	470.15	16.56	79 (100%)	467.90	17.24
18-19	F	11 (20%)	426.64	144.85	3 (6%)	482.00	15.72	14 (26%)	438.50	129.36
	M	26 (48%)	450.19	94.41	14 (26%)	474.07	20.72	40 (74%)	458.55	77.39
Total		37 (68%)	443.19	110.17	17 (32%)	475.54	19.73	54 (100%)	453.35	92.69

According to Table 14 for the 2012-2013 and 2013-2014 school year for fourth grade students, the highest mathematics mean score was represented by White female students (M = 155.00, SD = .00), and the lowest mathematics mean score was represented by Black female students (M = 145.75, SD = 11.45). From the 2014-2015 to the 2018-2019 school years, the highest math score was represented by White female students (M = 482.00, SD = 15.72), and the lowest mathematics mean score was represented by Black female students (M = 426.64, SD = 144.85).

Figure 14 indicates a visual representation of trend analysis data for mean mathematics scores of all students during fourth grade. The data encompasses time from the 2012-2013 school year to the 2018-2019 school year.

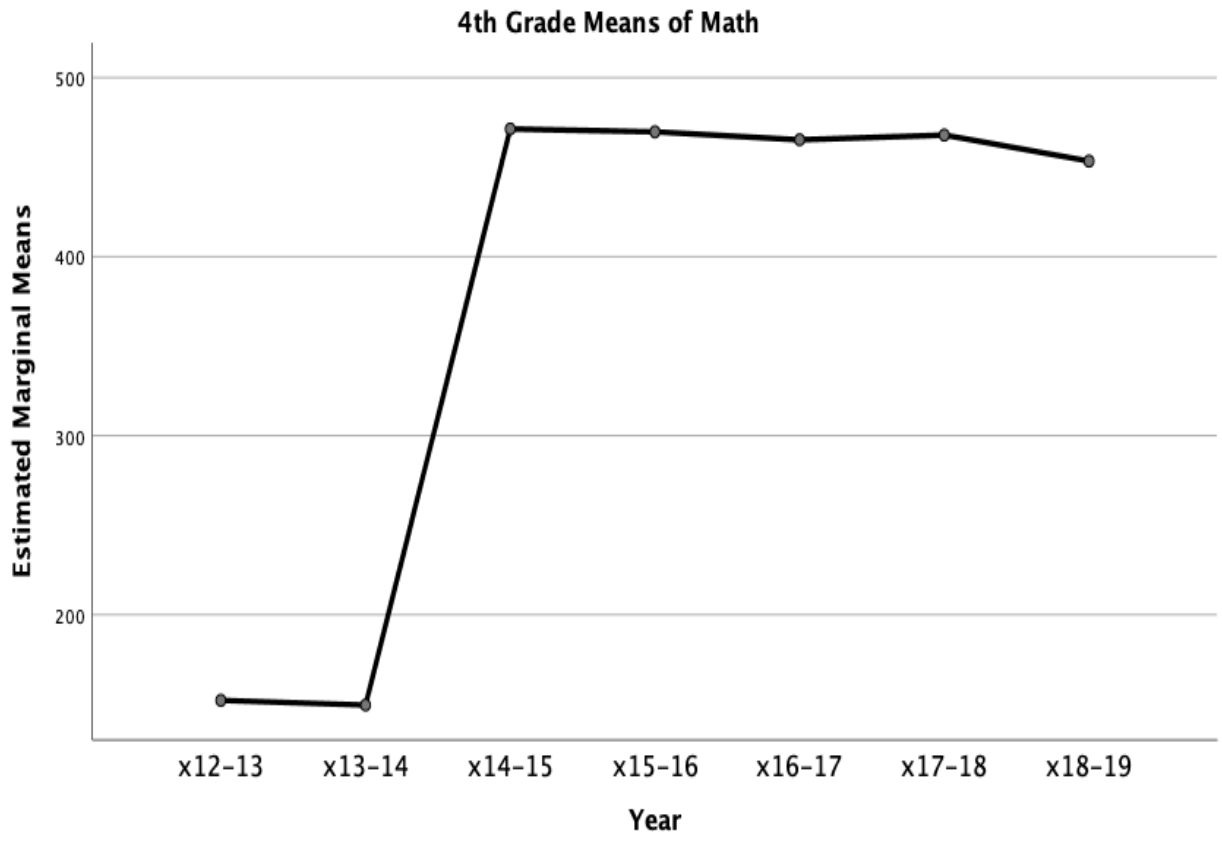

Figure 14. *Trend Analysis for Mathematics Scores for All Fourth Grade Students*

Figure 14 indicates a stable trend existed in the mean scores for mathematics for the fourth-grade students throughout the seven-year period. From the 2012-2013 school year to the 2013-2014 school year, a very slight drop in scores occurred. Likewise, from the 2014-2015 school year to the 2018-2019 school year, a very slight drop was observed every year except for a slight increase in 2017-2018 and a slight downward movement during 2018-19.

Conclusion 15: After implementation of PBIS, there was a stable trend in the mathematics mean scores for the fourth-grade students throughout the seven-year period with a slight downward trend during the 2018-19 year.

Figure 15 represents the trend analysis of the mathematics mean scores for fourth grade female students from the 2012-2013 school year to the 2018-2019 school year. The trend analysis data are shown by race.

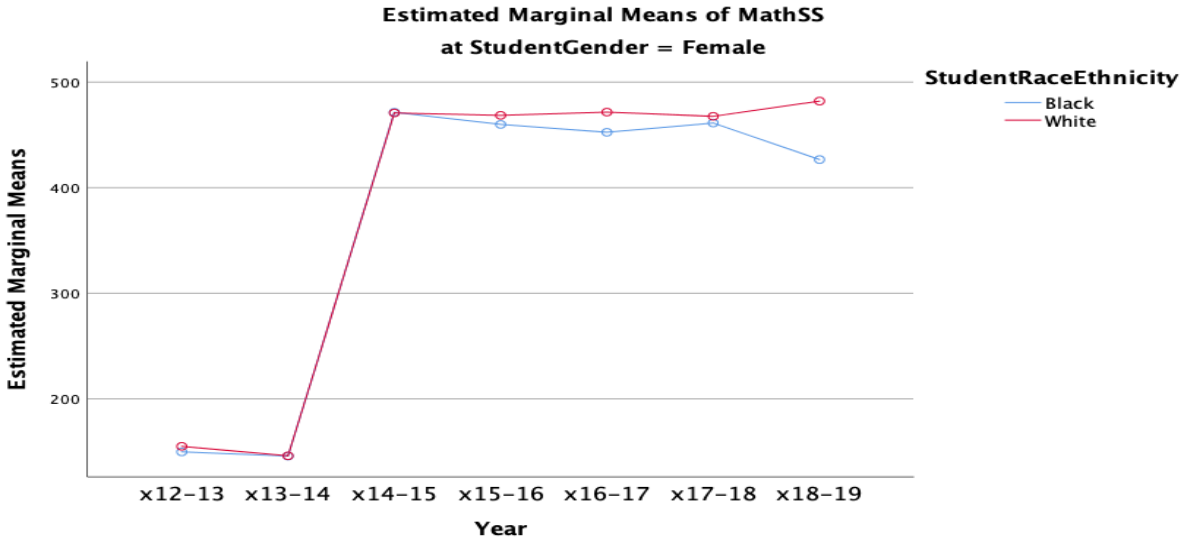

Figure 15. *Trend Analysis for Fourth Grade Female Students Mathematics Scores from 2012-2013 School Year to the 2018-2019 School Year*

According to the trend analysis in Figure 15, fourth grade White female students and Black female students had similar mathematics scores during the 2012-13, 2013-14, 2014-15, and 2017-18 school years after the implementation of PBIS. Fourth grade White female students had slightly higher mean scores in mathematics than Black female students for 2015-16 and 2018-19 years.

Conclusion 16: After implementation of PBIS, there were similar mathematics scores for White female students and Black female students throughout the seven-year period. White female students had an upward trend for their mathematics mean score during the 2018-19 year.

Figure 16 represents the trend analysis for mathematics mean scores for fourth-grade male students from the 2012-2013 school year to the 2018-2019 school year. The trend analysis data are provided by race.

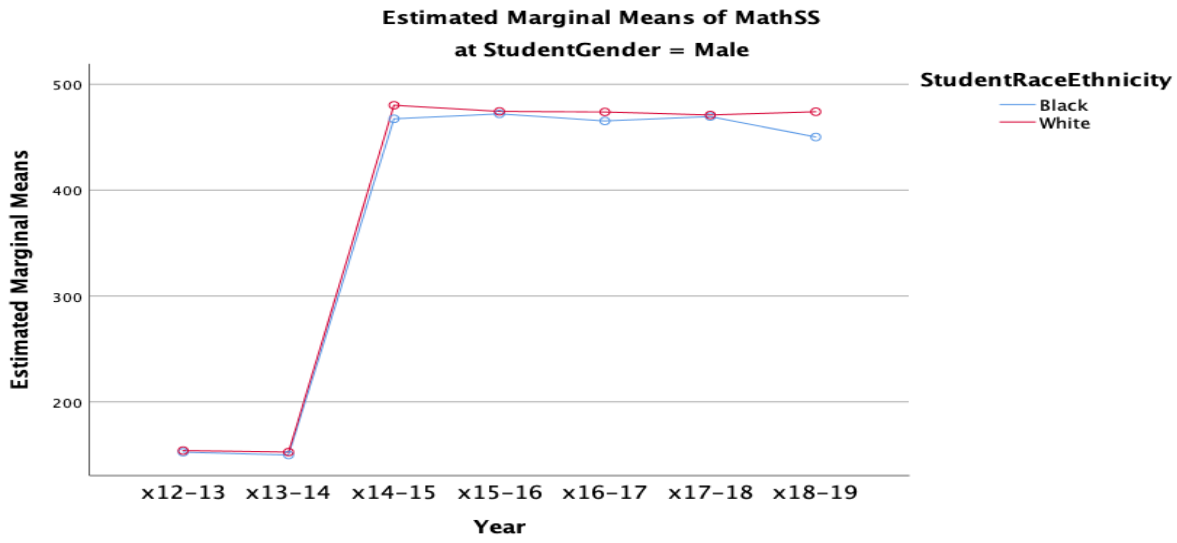

Figure 16. *Trend Analysis for Fourth Grade Male Students Mathematics Scores from 2012-2013 School Year to the 2018-2019 School Year*

According to the trend analysis in Figure 16, fourth grade Black male students and White male students had comparable mean scores for mathematics every year of the study except for the 2018-2019 school year. During the 2018-2019 school year, White male students had a slightly higher mathematics mean score than Black male students.

Conclusion 17: After implementation of PBIS, fourth grade Black male students and White male students had comparable mean scores for mathematics every year of the study except for the

2018-2019 school year when White male students had a slightly higher mathematics mean score than Black students.

Table 15 provides a display of the trend analysis data for fifth-grade students mean scores for mathematics from the 2012-2013 school year to the 2018-2019 school year. The table includes the number of students, means for mathematics scores, and standard deviations of the students while enrolled in fifth grade.

Table 15

Fifth Grade Descriptive Statistics for Mathematics Scores from the 2012-2013 School Year to the 2018-2019 School Year

Year	**N**	**Mean**	**SD**
2012-13	69	146.83	12.14
2013-14	80	149.40	11.66
2014-15	88	552.91	27.32
2015-16	86	564.36	35.69
2016-17	105	553.29	28.96
2017-18	109	556.60	15.49
2018-19	79	562.47	17.05

According to Table 15, the highest mathematics mean score was during the 2015-2016 school year (M = 564.36, SD = 35.69). The lowest mathematics mean score was represented during the 2012-2013 school year (M = 146.83, SD = 12.138). In general, mathematics means

scores remained stable throughout the seven years with slight increases during the second, fourth, and seventh years after implementation of PBIS.

Table 16 indicates frequencies, percentages, means, and standard deviations of mathematics scores for fifth-grade students from the 2012-2013 school year through the 2018-2019 school year. The trend analysis data are provided by race and gender.

Table 16

Math Frequencies, Percentages, Means, and Standard Deviations of Fifth Grade Students After Implementation of PBIS by Gender and Race

		Black			**White**			**Overall Total**		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
12-13	F	8 (12%)	141.50	9.37	3 (4%)	150.00	4.00	11 (16%)	143.82	8.97
	M	38 (56%)	147.26	14.13	19 (28%)	148.16	9.45	57 (84%)	147.40	12.63
Total		46 (68%)	146.26	13.52	22 (32%)	148.41	8.86	68 (100%)	146.83	12.14
13-14	F	23 (29%)	150.35	8.09	3 (4%)	152.33	14.43	26 (33%)	150.58	8.64
	M	39 (49%)	146.97	13.76	15 (18%)	153.67	9.021	54 (67%)	148.83	12.90
Total		62 (78%)	148.23	12.01	18 (22%)	153.44	9.581	80 (100%)	149.40	11.66
14-15	F	17 (20%)	548.53	21.50	15 (17%)	567.33	17.47	32 (37%)	557.34	21.61
	M	35 (40%)	545.54	32.48	20 (23%)	558.70	24.50	55 (63%)	550.38	29.99
Total		52 (60%)	546.52	29.16	35 (40%)	562.40	21.90	87 (100%)	552.91	27.32
15-16	F	12 (14%)	556.17	12.07	17 (20%)	563.24	17.20	29 (34%)	560.31	15.46
	M	36 (42%)	562.50	49.52	21 (24%)	573.14	25.99	57 (66%)	566.42	42.43
Total		48 (56%)	560.92	43.22	38 (44%)	568.71	22.76	86 (100%)	564.36	35.69
16-17	F	26 (25%)	536.69	41.90	13 (12%)	560.00	12.24	39 (37%)	544.46	36.42
	M	40 (38%)	554.50	25.52	26 (25%)	564.65	14.10	66 (63%)	558.50	22.19
Total		66 (63%)	547.48	33.81	39 (37%)	563.10	13.53	105 (100%)	553.29	28.96

Table 16 (continued)

		Black			White			Overall Total		
Year	**Gen**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**	**N (%)**	**M**	**SD**
17-18	F	27 (25%)	553.37	10.42	6 (5%)	559.17	17.24	33 (30%)	554.42	11.82
	M	51 (47%)	555.35	15.75	25 (23%)	562.00	18.36	76 (70%)	557.54	16.863
Total		78 (72%)	554.67	14.09	31 (28%)	561.45	17.93	109 (100%)	556.60	15.50
18-19	F	19 (24%)	556.26	10.50	6 (8%)	576.33	14.45	25 (32%)	561.08	14.24
	M	37 (47%)	563.54	12.35	17 (21%)	562.18	27.63	54 (68%)	563.11	18.29
Total		56 (71%)	561.07	12.17	23 (29%)	565.87	25.36	79 (100%)	562.47	17.05

According to Table 16, fifth grade students' data for the 2012-2013 and 2013-2014 school years show the highest mathematics mean score was for White male students (M = 153.67, SD = 9.02). The lowest mathematics mean score was for Black female students (M = 141.50, SD = 9.37). From the 2014-2015 to the 2018-2019 school years, the highest mathematics mean score was for White female students (M = 576.33, SD = 14.45). The lowest mathematics mean score during the 2014-15 through 2018-19 school years was for Black female students (M = 536.69, SD = 41.90).

Figure 17 offers a visual representation of the trend analysis of mathematics mean scores for all fifth-grade students. The data are from the 2012-2013 school year to the 2018-2019 school year.

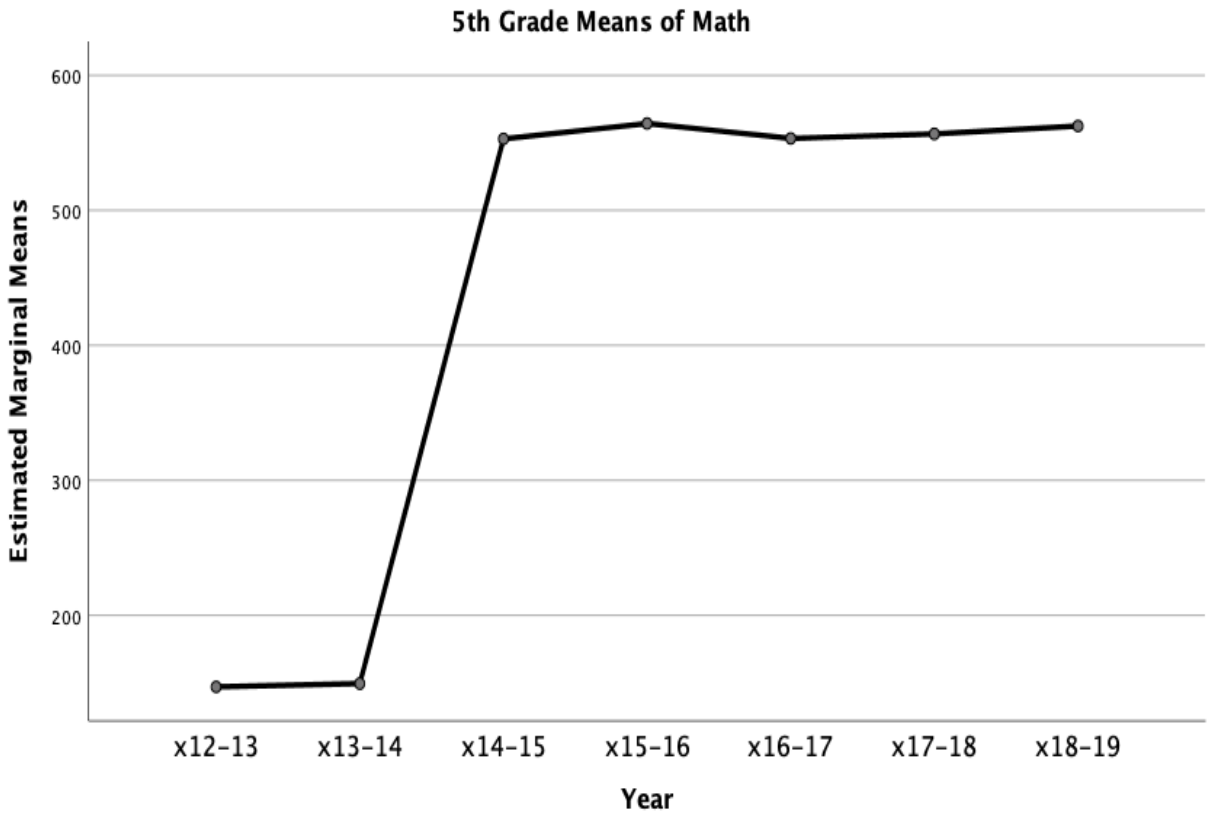

Figure 17. *Trend Analysis for Mathematics Scores for All Fifth Grade Students*

Figure 17 indicates that from the 2012-2013 school year to the 2013-2014 school year, a minimal increase in mathematics mean scores was observed for students enrolled in fifth grade. From the 2014-2015 school year to the 2018-2019 school year, a slight increase in the mathematics mean score was observed in 2015-2016 followed by a slight decrease in the mathematics mean score in 2016-2017.

Conclusion 18: There was a somewhat steady trend in the mathematics mean scores for all fifth-grade students during the seven years after implementation of PBIS.

Figure 18 represents the trend analysis for fifth grade female students' mathematics mean scores from the 2012-2013 school year to the 2018-2019 school year. The trend analysis data are reported by race.

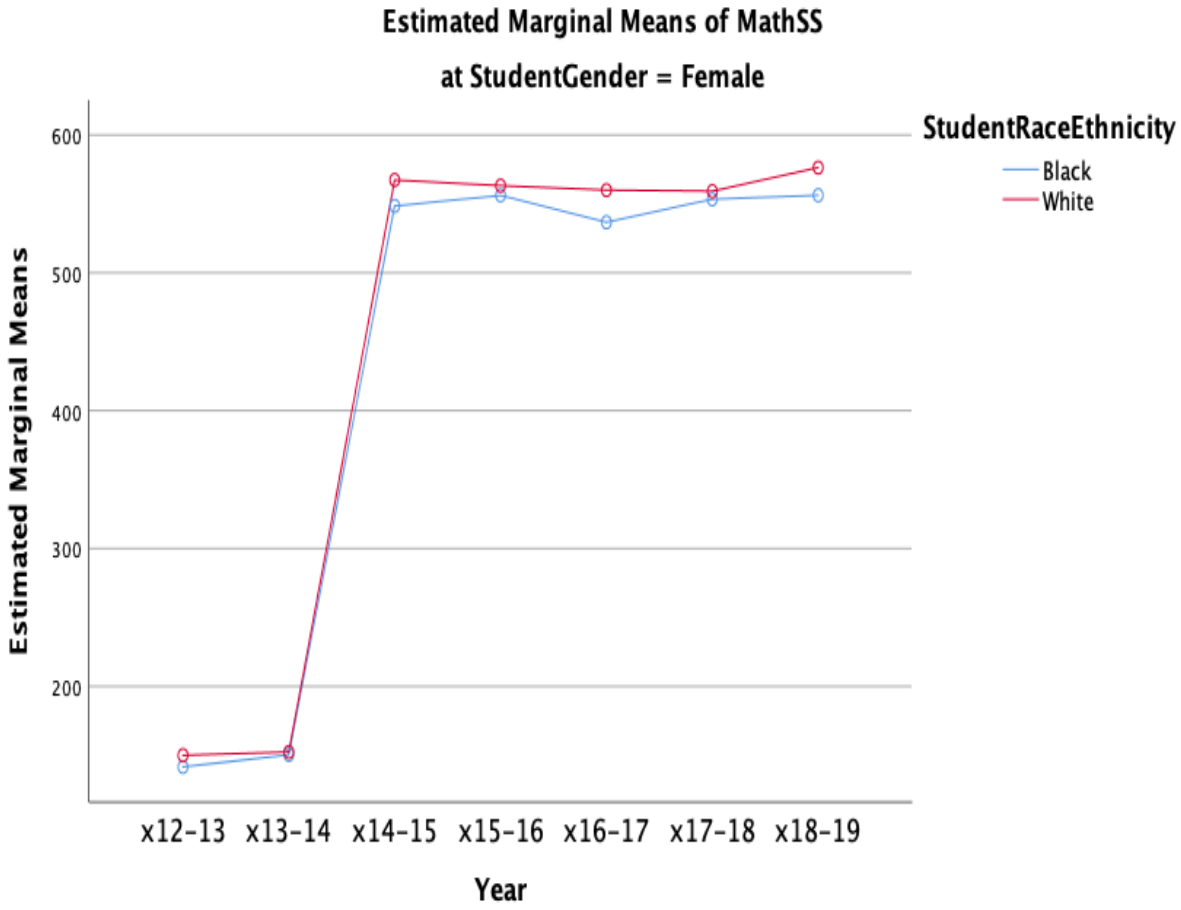

Figure 18. *Trend Analysis for Fifth Grade Female Students Math Scores from 2012-2013 School Year to the 2018-2019 School Year*

According to the trend analysis in Figure 18, White female students had higher mathematics mean scores than Black female students every year after implementation of PBIS except during 2013-14. In particular, White female fifth grade students had observable higher

mathematics mean scores than Black female students for the 2016-2017 school year and the 2018-2019 school year. Mathematics mean scores were very similar for fifth grade White female students and fifth grade Black female students during the second, fourth, and sixth years of PBIS implementation.

Conclusion 19: After implementation of PBIS, fifth grade White female students had higher mathematics mean scores than Black female students trending over the seven years.

Figure 19 represents the trend analysis data for fifth grade male students' mathematics mean scores from the 2012-2013 school year to the 2018-2019 school year. The data are provided by race.

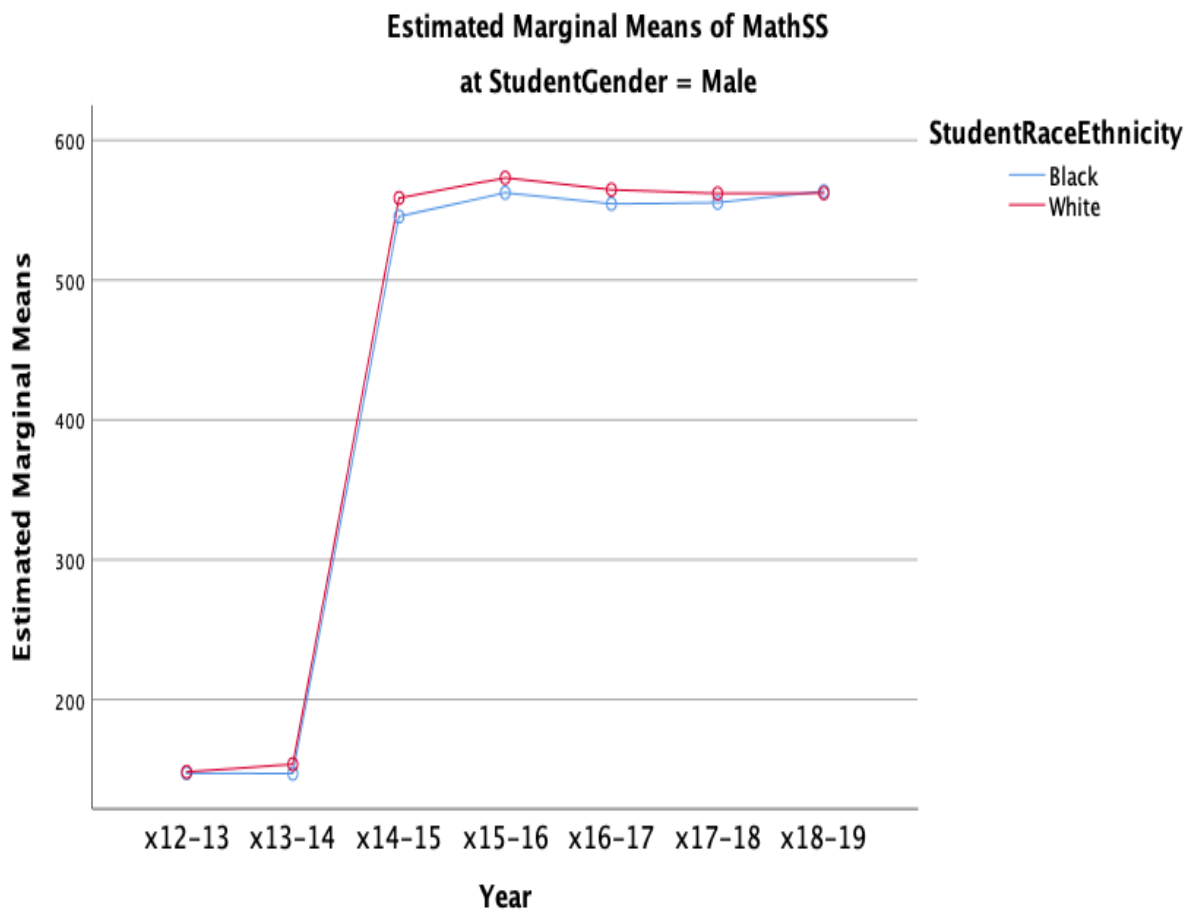

Figure 19. *Trend Analysis for Mean Scores for Fifth Grade Male Students ELA Scores from 2012-2013 School Year to the 2018-2019 School Year*

According to the trend analysis in Figure 19, White male students maintained slightly higher mathematics mean scores than Black male students every year. However, mathematics mean scores were very similar for fifth grade White male students and fifth grade Black male students during the first and seventh years of PBIS implementation.

Conclusion 20: After implementation of PBIS, fifth grade White male students had higher mathematics mean scores than Black male students during the seven-year period.

Data Analysis for Research Question Three

Do relationships exist between the number of fourth-grade students' discipline referrals and academic achievement scores and number of fifth grade students' discipline referrals and academic achievement scores as measured by the Mississippi Curriculum Test 2nd Edition (MCT2) in language arts one year before implementation and seven years after implementation of PBIS (2012-2019)?

Table 17 provides a display of the data showing Pearson's correlations for ELA scores and the number of discipline referrals for students in the fourth grade after implementation of PBIS. Data are shown from the 2011-2012 school year to the 2018-2019 school year. Pearson's Correlations are used to determine the strength (weak, moderate, or strong) of a statistical relationship between two variables. The nature of the positive or negative relationship is determined on a 1 to -1 scale.

Table 18

Pearson's Correlation of Number of Discipline Referrals and ELA Scores for Fourth Grade Students

Year	N	Pearson's r	Sig.
2011-12	65	-.182	.146
2012-13	72	-.029	.808
2013-14	76	-.023	.857
2014-15	99	-.144	.181
2015-16	78	-.206	.070
2016-17	116	-.156	.094
2017-18	79	.060	.600
2018-19	54	-.084	.548

*$p \leq .05$

Table 17 shows there were essentially negative weak relationships (r = -.206 to r = .060) between ELA scores and the number of discipline referrals for fourth grade students each year. Negative correlations were shown for 2011-2012, 2012-2013, 2013-2014, 2015-2016, 2016-2017, and 2018-2019. There were no statistically significant relationships for ELA scores and the number of discipline referrals for all eight years.

Conclusion 21: There were no statistically significant relationships between the number of discipline referrals for fourth grade students and their ELA scores one year before implementation of PBIS or seven years after implementation of PBIS.

Table 18 provides a display of data showing Pearson's correlations for ELA scores and the number of discipline referrals for students in the fifth grade before and after implementation of PBIS. Data are shown from the 2011-2012 school year to the 2018-2019 school year.

Table 19

Pearson's Correlation of Number of Discipline Referrals and ELA Scores for Fifth Grade Students

Year	**N**	**Pearson's r**	**Sig.**
2011-12	51	.074	.608
2012-13	69	-.176	.147
2013-14	80	-.050	.662
2014-15	88	.025	.810
2015-16	86	.017	.873
2016-17	105	-.093	.344
2017-18	109	-.245	.010*
2018-19	79	.119	.296

*$p \leq .05$

Table 18 indicates four weak positive and four weak negative relationships (r = -.245 to r = .119) for fifth grade students' number of discipline referrals and ELA scores. Positive weak relationships were noted for 2011-2012, 2014-2015, 2015-2016, and 2018-2019 school years. Negative weak relationships were observed for the 2012-2013, 2013-2014, 2016-2017, 2017-2018 school years. A statistically significant negative relationship was observed for the number

of discipline referrals and ELA mean scores for fifth-grade students during the 2017-2018 school year *(r* = -.245, *p* = *.010*).

Conclusion 22: A statistically significant weak negative relationship *(r* = -.245, *p* = *.010*) was found between the number of discipline referrals and ELA scores of fifth-grade students during the sixth year (2017-2018 school year) after implementation of PBIS.

Data Analysis for Research Question 4

Do relationships exist between the number of discipline referrals and academic achievement scores and fifth-grade students' discipline referrals and academic achievement scores as measured by the end-of-year proficiency exams in math one year before implementation and seven years after implementation of PBIS (2012-2019)?

Table 19 provides a display of the data showing Pearson's correlations for mathematics mean scores and the number of discipline referrals for students in the fourth grade. Data are shown from the 2011-2012 school year to the 2018-2019 school year.

Table 20

Pearson's Correlation of Mathematics Scores and the Number of Discipline Referrals for Fourth Grade Students

Year	**N**	**Pearson's r**	**Sig.**
2011-12	65	-.144	.253
2012-13	72	-.047	.693
2013-14	76	.070	.547
2014-15	99	-.079	.438
2015-16	78	-.122	.286
2016-17	116	-.160	.087
2017-18	79	-.233	.039*
2018-19	54	-.120	.389

**p= .05*

Table 19 indicates there were essentially negative, weak relationships ($r = -.233$ to $r = .070$) between math mean scores and the number of discipline referrals for fourth-grade students. Negative correlations were shown for the 2011-2012, 2012-2013, 2014-2015, 2015-2016, 2016-2017, 2017-2018, and 2018-2019 school years. A statistically significant relationship ($r = -.233$, $p = .039$) was found for the fourth-grade students discipline referrals and math scores for the 2017-2018 school year.

Conclusion 23: A statistically significant weak negative relationship ($r = -.233$, $p = .039$) was found between the number of discipline referrals and math mean scores of fourth grade students for the sixth year (2017-2018 school year) after implementation of PBIS.

Table 20 provides a display of the data showing the Pearson's correlation for the number of discipline referrals and math mean scores for students in the fifth grade after implementation of PBIS. Data are shown from the 2011-2012 school year to the 2018-2019 school year.

Table 21

Pearson's Correlation of the Number of Discipline Referrals and Mathematics Scores for Fifth Grade Students

Year	**N**	**Pearson's r**	**Sig.**
2011-12	51	-.188	.408
2012-13	69	-.177	.146
2013-14	80	-.018	.875
2014-15	88	-.130	.229
2015-16	86	-.052	.633
2016-17	105	-.061	.540
2017-18	109	-.197	.040*
2018-19	79	-.062	.589

*$p \leq .05$

Table 20 shows there were negative weak relationships ($r = -.188$ to $r = -.197$) between the mathematics mean scores and number of discipline referrals for the fifth-grade students each year. A statistically significant negative, very weak relationship was indicated ($r = -.197$, $p = .04$) for the 2017-2018 school year for the math scores and number of discipline referrals for the fifth-grade students.

Conclusion 24: A statistically significant negative, very weak relationship (r = -.197, p = .04) was found between the number of discipline referrals and math mean scores for fifth grade students during the sixth year (2017-2018 school year) after implementation of PBIS.

Chapter Summary

The purpose of this chapter was to offer the analysis of the data for the research study. Data were compiled from the 2011-2012 school year, the year before the implementation of PBIS, and every year following implementation through the 2018-2019 school year. The following are the major findings for the study. A statistically significant difference was recognized in discipline referrals from the year before PBIS implementation (2011-2012 school year) to the first year of full PBIS implementation (2012-2013 school year). The data did not indicate statistically significant differences in the number of discipline referrals by gender or race; however, in overwhelmingly most cases, Black male students and Black female students had higher mean scores for the number of discipline referrals than White male and White female students before and after PBIS implementation. According to the data, there were no statistically significant relationships between fourth grade students ELA mean scores and the number of discipline referrals before and after implementation of PBIS. The data indicated a statistically significant relationship for fifth grade students between discipline referrals and ELA mean scores was found for the 2017-2018 school year. Likewise, statistically significant relationships were found between fourth grade students mathematics mean scores and the number of discipline referrals for the 2017-18 year and between fifth grade students mathematics mean scores and the number of discipline referrals for the 2017-18 school year.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this research study was to determine the effects of the implementation of PBIS on student discipline, ELA scores, and math scores. Also, this study attempted to ascertain statistically significant relationships between the number of student discipline referrals and ELA mean scores and the number of student discipline referrals and math mean scores. An existing database was analyzed to answer the research questions in the study. The data for the study included that of fourth and fifth grade students over an eight-year period (2011-2012 school year to the 2018-2019 school year). This chapter offers a discussion and interpretation of the results of the research, conclusions of the study, limitations of the study, and implications of the results. This chapter also presents general recommendations for school leaders and recommendations for future research.

The study was rooted in student behavior, teacher responses to behavior, and the social learning theory. PBIS is a discipline strategy that focuses on the positive behaviors rather than the negative behaviors of students and often searches for nonpunitive consequences when student behaviors do not meet normal expectations (Christofferson & Callahan, 2015). The social learning theory dictates that students can learn behaviors from direct teaching (just as an academic subject) or observing social interactions (Chavis, 2011; Rosenstock et al., 1988).

Summary

This study focused on the schoolwide implementation of PBIS in a local rural school district. Data were included for the year before full implementation of PBIS (2011-2012) and the seven years following full implementation of PBIS (2012-2013 school year to 2018-2019 school year). A quasi experimental research design was used to conduct the study.

To address student behavior, teacher responses to negative behavior, and low academic achievement, the selected school decided to train teachers accordingly and implement PBIS as a schoolwide discipline strategy. For the second year of the study, teachers and administrators were expected to have a positive, nonpunitive plan in place for classroom management and responses to student behavior. Also, PBIS was intended to counter the fact that minorities and males were often overrepresented when exclusionary punishments were considered.

PBIS was introduced and considered as a multitiered discipline process with several components that make it potentially successful. Several studies indicated the implementation of PBIS improved behavior and student achievement (Atiles et al., 2017; Christofferson & Callahan, 2015; Cholewa et al., 2017; Feuerborn & Tyre, 2012; Horner & Sugai, 2009; Hyman, 1996; Lee, 2019; Medina, 2017; Northeast Foundation for Children, 2009; Read & Lampron, 2012; Way, 2011). Johnson et al. (2013) indicated that the implementation of PBIS improved the overall culture, which, in turn caused a decrease in discipline issues and an increase in academic gains. The school leader plays an important role in the implementation and overall success of PBIS (Richards, et al., 2014).

The research questions focused on the effects of PBIS on student behavior, ELA scores, and mathematics scores for fourth and fifth grade students over a seven-year period. Four research questions were developed and guided the study.

1. Are there statistically significant differences by gender and race/ethnicity in the number of discipline referrals after the implementation of the first year of PBIS as measured using data for the number of discipline office referrals when students were enrolled in the fourth grade before implementation of PBIS and fifth grade after implementation of PBIS (2011-2012 to 2012-2013)?
2. What are the trends by gender and race in the number of discipline office referrals, ELA scores, and mathematics scores for fourth- and fifth-grade students after the implementation of PBIS during a seven-year period (2012-2019)?
3. Do relationships exist between the number of fourth-grade students' disciplinary referrals and academic achievement scores and fifth-grade students' disciplinary referrals and academic achievement scores, as measured by the end-of-year proficiency exams in ELA on year before implementation and seven years after implementation of PBIS (2012-2019)?
4. Do relationships exist between the number of fourth-grade students' discipline referrals and academic achievement scores and fifth-grade students' discipline referrals and academic achievement scores, as measured by the end-of-year proficiency exams in math on year before implementation and seven years after implementation of PBIS (2012-2019)?

Data for study were used from a rural public-school district in Mississippi that included 639 fourth grade students and 667 fifth grade students from the 2011-2012 school year through the 2018-2019 school year. A pretest-posttest research design was utilized to determine the effects of PBIS implementation on discipline referrals for the first year of implementation. Trend

analyses and correlations were completed to determine the effects of the implementation of PBIS on the number of discipline referrals, ELA scores, and mathematics scores.

A statistically significant difference was recognized in discipline referrals from the year before PBIS implementation (2011-2012 school year) to the first year of full PBIS implementation (2012-2013 school year). The data did not indicate statistically significant differences in the number of discipline referrals by gender or race. Generally, Black male students and Black female students had higher mean scores for the number of discipline referrals than White male and White female students before and after PBIS implementation. The results of the study showed White students outscored Black students in ELA for a majority of the years of the study. There were no statistically significant relationships for fourth grade students between the number of discipline referrals and ELA scores from the 2011-2012 school year to the 2018-2019 school year. The data indicated a statistically significant weak relationship between fifth grade students' number of discipline referrals and ELA mean scores for the 2017-2018 school year. In addition, statistically significant weak relationships were found between fourth grade students mathematics mean scores and the number of discipline referrals for the 2017-18 year and between fifth grade students math mean scores and the number of discipline referrals for the 2017-18 school year.

Conclusions and Discussion

For the first research question, a paired samples T test was conducted to determine if there was a statistically significant difference in the number of referrals before the implementation of PBIS and the number of referrals after the implementation of PBIS. A statistical significance was reported ($p<.001$). For this research question the effect size is moderate (Cohen's d = .643).

The students had a higher mean score for the number of discipline referrals before implementation of PBIS than they did after implementation of PBIS. Also, the highest mean score represented for the number of discipline referrals was for Black male students during the 2011-2012 school year (M= 3.07, SD = 3.02), and the lowest mean score for the number of discipline referrals represented was for White female students during the 2012-2013 school year (M= 0, SD = .00).

Conclusion 1: There was a statistically significant difference in the number of discipline referrals for students from the fourth-grade year (2011-2012) before implementation of PBIS to the fifth-grade year (2012-2013) after implementation of PBIS. There was a slight decrease in the number of discipline referrals after implementation of PBIS.

Conclusion 2: The data did not show statistically significant differences in the number of discipline referrals by gender or by race, however, Black male students and Black female students had higher mean scores for the number of discipline referrals than White male students and White female students before and after implementation of PBIS.

The findings for the first research question are consistent with prior research studies that suggested full PBIS implementation improves student behavior and lowers discipline referral numbers (Johnson, et al., 2013; LaSalle, et al., 2018; & Myers et al., 2017). Further consistency is indicated by previous research that offers racial disparity in discipline referrals relating to Black students, particularly Black male students (Bottiani et al., 2016; O'Conner et al., 2014; Sullivan et al., 2013; Weissmann, 2015).

For the second research question, trend analyses were conducted to determine the trend data for discipline referrals, math scores, and ELA scores while students were enrolled in fourth grade and fifth grade. The trend analyses indicated the highest mean for discipline referrals for

fourth-grade students during the study was represented by Black males (m = 4.45, SD = 4.05). The lowest mean for discipline referrals was represented by White females (m = 1, SD = .00) during the 2012-2013, 2013-2014, and 2018-2019 school years. For fifth-grade students, the highest mean for discipline referrals was represented by the Black male gender/race group (m = 4.97, SD = 4.75) during the 2016-2017 school year. The lowest mean was represented by White females (m = 1.33, SD = .58) during the 2012-2013 school year.

The following conclusions were found for the second research questions. Data were analyzed by race and gender and included graphical illustrations of trends over the seven-year period.

Conclusion 3: The overall means in discipline referrals for fourth grade students indicated a variety of movement over the seven-year period. The overall lowest number of discipline referrals was during the second year after implementation of PBIS (2013-14). The number of discipline referrals had its highest peak during the 2014-15 school year.

Conclusion 4: Black female students had higher means for the number of discipline referrals than White female students every year of the study except for the 2014-2015 school year. During the 2014-2015 school year, White female students had a higher mean for the number of discipline referrals than Black female students.

Conclusion 5: Black male students presented higher mean scores for the number of discipline referrals than White male students for four of the seven years of the study. Steep increases in the means for discipline referrals occurred for both groups during the 2014-2015 year and for Black male students during the 2017-2018 and 2018-2019 school years.

Conclusion 6: The lowest mean for the number of discipline referrals for fifth grade students was during the first year of implementation (2012-2013), and the highest mean for the

number of discipline referrals was during the 2015-2016 school year followed by slight decreases during subsequent years.

Conclusion 7: With the exception of the 2015-2016 and 2016-2017 school years, Black females had high mean scores for the number of discipline referrals than White females every year of the study.

Conclusion 8: Black male students had higher means for the number of discipline referrals than White male students every year of the study. There was a considerable increase in the mean for the number of discipline referrals for Black male students during the 2016-2017 school year.

Conclusion 9: From the 2014-2015 school year to the 2018-2019 school year after implementation of PBIS, for fourth grade students there was a slight downward trend for ELA mean scores every year except for the 2017-2018 school year where a slight upward trend was noted.

Conclusion 10: After PBIS implementation, fourth grade Black female students had a slightly higher ELA mean score than White female students during the 2012-2013 and 2013-2014 school years. Fourth grade White female students had slightly higher ELA mean scores than Black female students during the 2014 to the 2017-2018 school years and a somewhat higher increase during the 2018-2019 school year.

Conclusion 11: For fourth grade students, White male student had slightly higher ELA mean scores than Black male students in every year of the study with a noticeable higher ELA mean score during the 2018-2019 school year.

Conclusion 12: After implementation of PBIS, there was a very stable trend every year for fifth grade students ELA mean scores with a slight downward trend during the 2016-17 school year.

Conclusion 13: After implementation of PBIS, the ELA mean scores for fifth grade White female students was higher than the ELA mean scores of fifth grade Black female students every year during the seven-year period.

Conclusion 14: After implementation of PBIS, the ELA mean scores for fifth grade White male students was slightly higher than the ELA mean scores of fifth grade Black male students every year during the seven-year period.

Conclusion 15: After implementation of PBIS, there was a stable trend in the mathematics mean scores for the fourth-grade students throughout the seven-year period with a slight downward trend during the 2018-19 year.

Conclusion 16: After implementation of PBIS, there were similar mathematics scores for White female students and Black female students throughout the seven-year period. White female students had an upward trend for their mathematics mean score during the 2018-19 year.

Conclusion 17: After implementation of PBIS, fourth grade Black male students and White male students had comparable mean scores for mathematics every year of the study except for the 2018-2019 school year when White male students had a slightly higher mathematics mean score than Black students.

Conclusion 18: There was a somewhat steady trend in the mathematics mean scores for all fifth-grade students during the seven years after implementation of PBIS.

Conclusion 19: After implementation of PBIS, fifth grade White female students had higher mathematics mean scores than Black female students trending over the seven years.

Conclusion 20: After implementation of PBIS, fifth grade White male students had higher mathematics mean scores than Black male students during the seven-year period.

This results from the trend analyses in Research Question 2 is aligned with previous studies. Prior studies indicated that Black students, especially males, are more likely to have the highest representation of all race and gender subgroups relating to discipline and the lowest test scores of all racial and gender subgroups (Haight et al., 2016; Hemphill & Schneider, 2013; Little & Tolbert, 2018; Noltemeyer et al., 2015).

Certain factors were considered when contemplating the discipline referral counts, ELA scores, and math scores. For example, a school or district wide focus on "tardiness" or "dress code" may have caused the referral count to be a high for students who would not normally receive discipline referrals. Also, a change in handbook definition could have influenced the referral count during years when there were considerable increases in discipline numbers. If the school board decides to define a fight differently than the year before, a student who could have been previously warned might now be suspended. Data trends could have been influenced by policy changes. An increase in the student discipline count could lead to student removal from the classroom setting and a decrease in student achievement.

For the third research question, a Pearson's correlation was conducted to determine the statistical relationships of ELA mean scores and the number of disciplinary referrals for fourth- and fifth-grade students. The following are the conclusions related to the third research question.

Conclusion 21: There were no statistically significant relationships between the number of discipline referrals for fourth grade students and their ELA scores one year before implementation of PBIS or seven years after implementation of PBIS.

Conclusion 22: A statistically significant weak negative relationship *(r* = -.245, *p* = *.010*) was found between the number of discipline referrals and ELA scores of fifth-grade students during the sixth year (2017-2018 school year) after implementation of PBIS.

In general, the findings of the study indicated that as the number of discipline referrals increased, academic achievement scores were lower. The findings from the third research question are consistent with the extant literature (Noltemeyer et al., 2015) in that there were statistically significant relationships between student discipline and academic performance.

For Research Question 4, a Pearson's correlation was conducted to determine the statistical relationships between math mean scores and the number of discipline referrals for fourth- and fifth-grade students. The following are the conclusions related to the fourth research question.

Conclusion 23: A statistically significant weak negative relationship (*r* = -.233, *p* = *.039*) was found between the number of discipline referrals and math mean scores of fourth grade students for the sixth year (2017-2018 school year) after implementation of PBIS.

Conclusion 24: A statistically significant negative, very weak relationship (*r* = -.197, *p* = .04) was found between the number of discipline referrals and math mean scores for fifth grade students during the sixth year (2017-2018 school year) after implementation of PBIS.

As stated above for the third research question, the findings of the study indicated that as the number of discipline referrals increased, academic achievement scores for math were lower. The findings for Research Question 4 are inconsistent with previous studies that suggested a significant relationship existed between academic achievement and student behavior (Gage et al., 2017; Hyman, 1996; Noltmeyer et al., 2015; Read & Lampron, 2012).

Limitations

The results of this research study reflected only the students in a single, rural school in Mississippi. This study's limitations include the small sample size. This research may not apply to students at various education levels. Also, teachers received considerable training in PBIS; however, the level to which teachers believed in and followed through with expectations could not be constantly monitored. Further, this research study did not consider a variety of factors including (but not limited to) socioeconomic status, family status, and medical status of the students as well as decision-making of teachers and administrators in making discipline referrals.

Implications for School Leadership

This research reviewed the discipline records and academic achievement before and after PBIS implementation. The findings from this research study can be used to encourage principals, assistant principals, and teachers to be thoughtful regarding the fairness of how discipline referrals are dispersed by race and gender throughout the school day. School leaders should make it a priority to create a school environment for students where students feel safe and secure and learning can freely take place.

Further, this research study may influence superintendents and board members as they make policies and procedures that encourage and command a more equitable atmosphere for students. Just as a building leader, policy makers and policy enforcers should create rules and policies that provide students with a safe, equitable atmosphere where the rules apply evenly to all races and genders. For example, district leaders should make every effort to hire building leaders who come from an over-represented population relating to discipline referrals. Also, building leaders should make a proactive effort to better understand the social climate of the

school and community to build better relationships with over-represented groups regarding discipline referrals.

General Recommendations for School Administrators

The following are general recommendations for school, district, and state administrators.

1. School administrators should consider using PBIS as part of an overall school discipline plan to improve student behavior and student achievement.

2. School administrators should study data regarding students' race and gender when training teachers and reviewing discipline reports.

3. School administrators should provide continuous training for teachers regarding PBIS.

4. School administrators should consistently observe classrooms and offer timely feedback to teachers regarding PBIS and classroom management.

5. School administrators should give additional attention to alternative means of classroom management to determine if any improvements can be added to the PBIS program.

6. School administrators should promote social justice and fairness by offering teacher training in cultural diversity and awareness to better understand student responses in certain social settings.

7. School administrators should promote social justice and fairness by building special relationships with over-represented subgroups regarding discipline to gain trust.

Recommendations for Further Research

Even though researchers have completed many studies regarding student discipline, PBIS, and student achievement, further research is needed on classroom management and ways to handle student discipline at all educational levels. The following are recommendations for future research.

1. Correlational studies should be conducted to investigate the relationships between the number of discipline referrals and students' academic performance by gender and race.

2. Longitudinal studies should be performed to determine extended effects of PBIS at the kindergarten through third grade levels and forward into middle and high school.

3. Analysis of other student related variables such as socioeconomic status, family history, and medical history should be investigated to determine if any relationships exists with these factors and student behaviors and academic performance.

4. Analysis of school variables such as teacher performance, administrator performance, and overall school grade should be researched to determine if any relationships exists with these factors and student behaviors and academic performance.

5. Qualitative studies may be conducted to investigate decision-making processes of school administrators and teachers regarding discipline referrals and consequences specifically in response to the overrepresentation of Black students receiving high numbers of discipline referrals.

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APPENDIX A

IRB APPROVAL

MISSISSIPPI STATE UNIVERSITY

Office of Research Compliance

Institutional Review Board for the Protection of Human Subjects in Research
P.O. Box 6223
53 Morgan Avenue
Mississippi State, MS 39762
P. 662.325.3294

www.orc.msstate.edu

NOTICE OF DETERMINATION FROM THE HUMAN RESEARCH PROTECTION PROGRAM

DATE:	December 10, 2019
TO:	Frankie Williams, PhD, Educational Leadership, Christopher Armstrong;Leigh McMullan;Stephanie King Christopher Armstrong, The Learning Center, John Daves, MS, Educational Leadership, Leigh McMullan, Educational Leadership, Stephanie King, PhD, Educational Leadership
PROTOCOL TITLE:	The Effects of Positive Behavior Interventions and Supports on the Number of Discipline Referrals and Academic Achievement of Fourth and Fifth Grade Students
PROTOCOL NUMBER:	IRB-19-526
	Approval Date: December 10, 2019 Expiration Date: December 09, 2024

EXEMPTION DETERMINATION

The review of your research study referenced above has been completed. The HRPP had made an Exemption Determination as defined by 45 CFR 46.101(b)4. Based on this determination, and in accordance with Federal Regulations, your research does not require further oversight by the HRPP.

Employing best practices for Exempt studies is strongly encouraged such as adherence to the ethical principles articulated in the Belmont Report, found at www.hhs.gov/ohrp/regulations-and-policy/belmont-report/# as well as the MSU HRPP Operations Manual, found at www.orc.msstate.edu/humansubjects. As part of best practices in research, it is the responsibility of the Principal Investigator to ensure that personnel added after this Exemption Determination notice have completed IRB training prior to their involvement in the research study. Additionally, to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so.

Based on this determination, this study has been inactivated in our system. This means that recruitment, enrollment, data collection, and/or data analysis **CAN** continue, yet personnel and procedural amendments to this study are no longer required. **If at any point, however, the risk to participants increases, you must contact the HRPP immediately. If you are unsure if your proposed change would increase the risk, please call the HRPP office and they can guide you.**

If this research is for a thesis or dissertation, this notification is your official documentation that the HRPP has made this determination.

If you have any questions relating to the protection of human research participants, please contact the HRPP Office at irb@research.msstate.edu. We wish you success in carrying out your research project.

Review Type:	EXEMPT
IRB Number:	IORG0000467

APPENDIX B

PERMISSION LETTER FROM SUPERINTENDENT AND PRINCIPAL

12-2-19

Superintendent [name redacted]:

The purpose of this correspondence is to be a request for permission to use student discipline and testing data to determine the effect of the implementation and continued use of PBIS is a primary discipline technique on student behavior and academic outcomes.

Specifically, from the 2011-2012 school year to the 2018-2019 school year, student discipline will be studied based on gender, race, and overall results. Further, this research will review end- of-the-year mathematics and language arts proficiency exams. Student testing data will be statistically analyzed to determine its relationship to the discipline data. This data will be entered into the SPSS statistical program for all calculations, and this program will determine if any significant statistical relationship exists.

Students' names and identification numbers will be removed, and the school will be referred to as a rural elementary school in Mississippi.

Thank you for granting me permission to use school district data to conduct my research.

Academically yours,

John A. Daves, Jr.

December 9, 2019

Dear Institutional Review Board:

The purpose of this correspondence is to be a letter of consent for John A. Daves, Jr. to complete research titled *The Effects of Positive Behavior Interventions and Supports on the Number of Discipline Referrals and Academic Achievement of Fourth and Fifth Grade Students* at Grenada Elementary School 4th and 5th and use all data deemed important for the purpose of completing this study. This letter also serves as assurance that this school complies with all requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protections of Pupil Rights Amendment (PPRA) and will ensure that the researcher is held to the highest standards.

Respectfully,

[Name redacted], Principal

APPENDIX C

RESEARCH QUESTIONS, DATA VARIABLES, SOURCE OF DATA, AND DATA ANALYSIS

Research Questions	Variables	Source	Data Analysis
1) Are there statistically significant differences by gender and race/ethnicity in the number of discipline referrals after the implementation of the first year of PBIS as measured using data for the number of discipline office referrals when students were enrolled in the 4th grade before implementation of PBIS and fifth grade after implementation of PBIS (2011-2012 to 2012-2013)?	Grade Gender Race Discipline referrals	SWIS Student Information System	Paired Samples T test
2) What are the trend analyses by gender and race in the number of discipline office referrals, ELA scores, and Mathematics scores for fourth and fifth grade students after the implementation of PBIS during a seven-year period (2012-2019)?	Grade Gender Race Math Scores ELA Scores Discipline Referrals	SWIS Student Information System Behavior Specialist	Descriptive Statistics
3) Do relationships exist between the number of fourth grade students' discipline referrals and academic achievement scores and fifth grade students' discipline referrals and academic achievement scores as measured by the end of the year proficiency exams in ELA one year before implementation and seven years after implementation of PBIS (2012-2019)?	Grade Gender Race ELA Scores Discipline Referrals	SWIS Student Information System Behavior Specialist	Pearson's Correlation
4) Do relationships exist between the number of fourth grade students' discipline referrals and academic achievement scores and fifth grade students' discipline referrals and academic achievement scores as measured by the MCT2 test in mathematics one year before implementation and seven years after implementation of PBIS (2012-2019)?	Grade Gender Race Math Scores Discipline Referrals	SWIS Student Information System Behavior Specialist	Pearson's Correlation