THE IMPACT OF PERCEIVED RELATIONSHIPS ON AT-RISK STUDENTS’
ACADEMIC ACHIEVEMENT AND ATTENDANCE IN ALGEBRA I

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by
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THE IMPACT OF PERCEIVED RELATIONSHIPS ON AT-RISK STUDENTS’ ACADEMIC ACHIEVEMENT AND ATTENDANCE IN ALGEBRA I

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ABSTRACT

THE IMPACT OF PERCEIVED RELATIONSHIPS ON AT-RISK STUDENTS’ ACADEMIC ACHIEVEMENT IN ALGEBRA I

by

Ashley Causey

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. A correlational study design was used to investigate this study. One hundred thirty eight students who were considered to be at-risk of dropping out of high school participated in this study from three high school campuses in a large district in Southeast Texas. Data were analyzed by correlation and partial correlation analysis. Results of the study determined that a small, positive relationship did exist between how connected a student felt to the Algebra I teacher and the student’s performance on the standardized exam. The student’s attendance appeared to not be related. For educators, these findings may provide information about how to staff classes with a high number of students considered to be at-risk of dropping out of high school by providing teachers who are able to help students feel connected in the classroom. These findings may also help teachers understand their individual impact on the student’s ability to complete high school and what they can do to help support this population of student.
ACKNOWLEDGEMENTS

First and foremost, I want to thank my Lord and Savior, Jesus Christ for the gifts you have given me. My hope is that I would be a good steward of the blessings and responsibility you have placed on my life. You have allowed me to continue to grow in knowledge as well as leadership and I pray that in all I do I would remember the command of Colossians 3:23, “Whatever, you do, do your work heartily, as to the Lord and not for men for it is from the Lord you will receive the reward of the inheritance.”

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Chapter I

Introduction to the Study

The concern about the number of students dropping out of high school has continued to grow (Arnold & Doctoroff, 2003; Sum & Harrington, 2003; Tapper, 2008). As a result, the Texas Education Agency (TEA) (2011) Academic Excellence Indicator System (AEIS) report has identified 46.3% of the total population of students in Texas as being at-risk of dropping out of high school using the 13 indicators outlined in the Texas Education Code 29.081 (2009a). Many students who end up leaving school prior to receiving their diploma have received failing grades in mathematics although those students who pass Algebra I during their ninth grade year have a considerably higher chance of completing high school (Menzer & Hampel, 2009; Silver, Saunders & Zarate, 2008).

Chapter I includes a background of the problem, the problem statement, a statement of the purpose of the study as well as the research questions. The rationale and significance of the study is then included along with assumptions, limitations, delimitations and definitions. The chapter concludes with a summary and the organization of the study.

Background

The Texas Education Code 29.081 (2009a) has identified characteristics by which the state will define a student who is considered to be at-risk of dropping out of high school. A student is considered to be at-risk if the student is under 21 years old and meets any of the following criteria:
• is not promoted for one or more school years; does not sustain a 70 or higher average in grades seven through 12 in two or more classes of core curriculum;
• does not pass the Texas Assessment of Knowledge and Skills (TAKS) test in grades three, five or eight;
• does not pass a readiness assessment in any grade from prekindergarten through grade three;
• is a parent or is pregnant;
• is in an alternative education program; during the current or previous school year has been expelled; is on parole or probation; has previously dropped out of school;
• is a student considered to be limited English proficient;
• is in the custody of the Department of Protective and Regulatory Services;
• is considered to be homeless; or resides in a residential placement facility.

(Texas Education Agency, 2009a)

There are other characteristics which many of these students have in common beyond those outlined in the Texas code (Arnold & Doctoroff, 2003; Carpenter & Ramirez, 2007; Sum & Harrington, 2003; Tapper, 2008). For example, many at-risk students come from a low socioeconomic background (Arnold & Doctoroff, 2003; Sum & Harrington, 2003; Tapper, 2008) and there have historically been fewer female students who are not completing their high school education when compared to their male counterparts (Carpenter & Ramriez, 2007; Kleinfield, 2009; Sum & Harrington, 2003).
It is important for students to complete high school for many reasons. For example, students who do not complete high school have a greater difficulty in finding employment and even when they are able to become employed, they typically have received lower income than those individuals who have a high school diploma (Orfield, 2004; Menzer & Hampel, 2009). Additionally, students who drop out of high school have been found to be four times more likely to be arrested than those individuals who completed high school and 82% of prisoners were found to be high school dropouts (Sum & Harrington, 2003).

Students who are considered to be at-risk of leaving high school prior to receiving their diploma are not performing at the same academic level as their peers who are not considered to be at-risk of dropping out of school (Arnold & Doctoroff, 2003; Brown & Rodriguez, 2009; Carpenter & Ramirez, 2007; Lalley & Miller, 2006; Kleinfeld, 2009; Sum & Harrington, 2003; Texas Education Agency, 2011). Consequently, students who are considered to be at-risk of dropping out of high school have scored lower on the math portion of the Texas Assessment of Knowledge and Skills (Texas Education Agency, 2011). In fact, a student who does not complete the ninth grade, as well as receive credit for Algebra I during that year, has been found to be at a high risk of not completing high school with a diploma (Menzer & Hampel, 2009; Morgatto, 2008; Schiller & Muller, 2003; Silver, Saunders & Zarate, 2008; Spielhagen, 2006). Not only does a student’s ability to successfully complete Algebra I during their freshman year have implications for their ability to finish high school, it also has lifelong implications as these students have been shown to have greater difficulty in their postsecondary endeavors (Morgatto, 2008; Schiller & Muller, 2003).
Problem Statement

Algebra I is considered to be the gatekeeper course for a student’s success in high school (Silver, Saunders & Zarate, 2008; Speilhagen, 2006). While the majority of students who drop out of high school receive failing grades in mathematics and only 35% of the students who do not pass Algebra I during the ninth grade will complete high school (Menzer & Hampel, 2009; Silver, Saunders & Zarate, 2008). A student’s ability to successfully complete Algebra I during the freshman year of high school is crucial to the student’s success in high school, post-secondary education and allows the student to have more success in finding a job (Morgatto, 2008; Orfield, 2004; Schiller & Muller, 2003).

Students who have teachers who demonstrated care for them appear to feel more connected to school have been found to have their attendance, academic achievement and behavior improved as a result of their positive relationship with the teacher (Brown & Rodriguez, 2009; Creasy, Jarvis & Knapcik, 2009; Fredricks, Blumenfeld & Paris, 2004; Furrer & Skinner, 2003; Knesting, 2008; Lan & Lantheir, 2003; Lee & Burkam, 2003; Pinata & Stuhlman, 2004). The teacher has a great impact in encouraging a student to persist through high school and has been shown to be able to help lessen the gap between students in the area of mathematics (Knesting, 2008; Wilcox & Angelis, 2011).

However, there is little research available which looks specifically at the impact of a positive relationship on the academic performance of a student identified to be at-risk of dropping out of high school specifically with the Algebra I teacher. Additionally, much of the research that has been conducted has been from the perception of the teacher with little information available about the student’s perception of their relationship with their teacher (Creasey, Jarvis & Knapcik, 2009; Knesting, 2008; Speilhagen, 2006).
Statement of the Purpose and Research Questions

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. The related research questions are:

1. Is there a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test?
2. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test?
3. Is there a relationship between the perceived level of student/teacher connectedness and attendance in Algebra I?
4. Is there a relationship between the perceived level of student/teacher anxiety and attendance in Algebra I?
5. Is there a relationship between the perceived level of student/teacher connectedness and performance on the STAAR Algebra I test when controlling for attendance?
6. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test when controlling for attendance?

Rationale and Significance of the Study

Since it is crucial for students to successfully complete Algebra I during their ninth grade year, it is important to determine the academic support needed for a student
who is considered to be at-risk of dropping out of high school to be successful. It is also essential to determine if there is a relationship between a student who is considered to be at-risk of dropping out of school’s perceived relationship with the teacher and the student’s academic performance. This study investigated the impact of perceived relationships on the academic performance of students considered to be at-risk of dropping out of high school in Algebra I. It is important to provide academic support to students who are considered to be at-risk of dropping out of high school especially during the ninth grade year in their algebra course and to determine the characteristics of teachers who work with this population of students (Menzer & Hampel, 2009; Silver, Saunders, & Zarate, 2008).

The current study investigated if a relationship exists between the academic performance of students considered to be at-risk of dropping out of high school and the perceived relationship with the student’s Algebra I teacher. The study outcome will help teachers who work with this population of students support these students in their classroom. It will also help administrators understand if maintaining a positive relationship is important for the academic success of this population of students. This knowledge will be a valuable help to administrators as they will seek to hire teachers who have characteristics that will foster relationships with this group of students.

**Assumptions**

This study assumes all research participants understood the survey questions, that the questions were valid and reliable for high school students, as well as the assumption that all students answered the interview questions honestly. This study also assumes that
students have a perception about their relationship with the teacher from their Algebra I course.

Limitations and Delimitations

The limitations of this study include that data were only collected from students in one school district in Southeast Texas therefore the limited nature of the sample does not allow for generalizations of the results to the state population of students considered to be at-risk of dropping out of high school. Since the focus of this study was on students considered to be at-risk of dropping out of high school, as defined by the Texas Education Agency (2009a), the results of this study cannot be generalized to all students in the same district or throughout the state of Texas.

The delimitations of the study were that this study only investigated the impact of perceived relationships with a student’s math teacher and thus the results cannot be generalized to include any teachers from other academic subjects. Since the study was conducted using students who were in the ninth grade for the first time during the 2011–2012 school year, outcomes cannot be applied to students in other grade levels. This study also cannot be applied to those students who are repeating the ninth grade. In addition, the results of this study cannot be applied to students who took Algebra I in the ninth grade during any other school years.

Definitions

- A student is considered to be at-risk if they are at a high risk of dropping out of high school (Texas Education Agency, 2009a).

- Stillwell, Sable and Plotts (2011) define a high school dropout as an individual who was enrolled in school but does not enroll in school at the beginning of the
following school year and had not received a high school diploma. Students who transfer to another district, private school, or are temporarily not enrolled due to sickness, suspension or death are not considered to be dropouts.

- The State of Texas Assessments of Academic Readiness (STAAR) is the assessment which replaced the Texas Assessment of Knowledge and Skills (TAKS) in Texas during the spring of 2012. Students are tested in Algebra I, Geometry, Algebra II, World Geography, World History, United States History, English I, English II, English III, Biology, Chemistry and Physics (Texas Education Agency, 2012a).

- The Texas Assessment of Knowledge and Skills (TAKS) was the statewide assessment given in Texas that assessed the statewide curriculum in the areas of mathematics, science, English language arts, and social studies in the grades three through 11 from the years 2003 – 2013 (Keng, McClarty & Davis, 2008).

- The Academic Excellence Indicator System (AEIS) report includes a wide range of data on the performance of students in districts and schools in Texas each year which includes but is not limited to student results on the state assessment, attendance rates, at-risk students, district staff, finances and student demographics (Texas Education Agency, 2012b).

- No Child Left Behind (NCLB) implemented accountability requirements for states, districts and schools to make sure that each major population represented made progress toward the goal of having every student performing math proficiently and reading by the year of 2014 (Hewitt, 2011).
The Student-Instructor Relationship Scale was originally created by Creasey, Jarvis and Knapcik to measure the perceived relationship college students had with their instructors (Creasey, Jarvis & Knapcik, 2009). The instrument consisted of 36 Likert-scaled items in which students responded to statements that described how connected they felt to their instructor and how anxious they were about their relationship with their teacher.

The Texas Education Code (TEC) is the set of laws established by the state of Texas which governs public education (Texas Education Code, 2009b)

Summary and Organization of the Study

This chapter included the background of the problem with the problem statement, purpose statement, research questions, assumptions, limitations/delimitations, and definitions. Chapter II includes a review of the relevant literature. Chapter II consists of information regarding the characteristics of students considered to be at-risk of dropping out of high school, their understanding of mathematics, the role of the teacher and the role of relationships. Chapter III focuses on the methodology used in the study. A discussion of the research questions, research design, population/participants, instrument used in the study, how the data were collected and analyzed is included in this chapter. Chapter IV deals with the analysis of the data collected in this study and Chapter V is a summary of the findings and includes recommendations for further research.
Chapter II

Review of the Literature

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. The review of literature consists of five major sections. The first section includes information about the characteristics of students considered to be at-risk of dropping out of high school. The second section provides an overview of how a student who is considered to be at-risk of dropping out of high school understands mathematics. The third section examines the teacher’s impact on the understanding of mathematics for a student considered to be at-risk of dropping out of high school. The fourth section explores the role of relationships in education for a student considered to be at-risk of dropping out of high school. The final section is a general summary of the chapter.

Characteristics of Students

According to the Texas Education Agency (2011) Academic Excellence Indicator System (AEIS) state report, 2,275,179 students were considered to be academically at-risk, making up 46.3% of the total population of students. As shown in the Texas Education Code 29.081 (2009a), a student is considered to be at-risk if the student is under 21 years old and meets any of the following criteria:
is not promoted for one or more school years; does not sustain a 70 or higher average in grades seven through 12 in two or more classes of core curriculum;

- does not pass the state TAKS test in grades three, five or eight;

- does not pass a readiness assessment in any grade from prekindergarten through grade three;

- is a parent or is pregnant;

- is in an alternative education program; during the current or previous school year has been expelled; is on parole or probation; has previously dropped out of school;

- is a student considered to be limited English proficient;

- is in the custody of the Department of Protective and Regulatory Services;

- is considered to be homeless; or resides in a residential placement facility. (Texas Education Agency, 2009a).

**Socioeconomic status.** There has been a growing concern in the number of students who are either at-risk of dropping out of high school or who are dropping out of high school in the nation, and a large number of these students came from a low socioeconomic background (Arnold & Doctoroff, 2003; Sum & Harrington, 2003; Tapper, 2008). Arnold and Doctoroff (2003) reported that approximately one third of children in America lived below the line of poverty for at least one year. They discussed how one of poverty’s greatest effects was the negative impact on a student’s academic achievement. This was evident in that only 2% of students eligible for free or reduced lunch in the fourth grade were considered to be advanced readers, and 12% were
considered to be proficient readers. Other aspects of poverty, they noted included that students who lived in a home with a low socioeconomic status tended to have poor nutrition, less access to health care and a lower quality of housing which all impacted the educational achievement of a student. Many of these students attended schools that received lower funding when compared to schools serving a higher socioeconomic population. Arnold and Doctoroff argued that to close the achievement gap between the two populations, funding for all students should be equitable.

Sum and Harrington (2003) reported that more students who were at-risk of dropping out of high school were attending public institutions over private ones. They suggested this was due, in large part, to the cost of enrolling in a private institution (Sum & Harrington, 2003; Carpenter & Ramirez, 2007). Carpenter and Ramirez (2007) found that an increase in the socioeconomic status of a family meant an increase in the parental involvement of the family and thus resulted in higher math achievement and gave the student a greater chance of finishing high school. They also determined that students who come from a two parent home have a greater chance of completing high school than a student from a single parent home.

**Race and culture.** The number of students considered to be at-risk of dropping out of high school was greater among Hispanic and African American students than among Caucasian students (Brown & Rodriguez, 2009; Carpenter & Ramirez, 2007; Sum & Harrington, 2003; Kleinfeld, 2009). Additionally, metropolitan cities with a highly diverse population were experiencing higher numbers of at-risk students in their schools (Sum & Harrington, 2003). Davis (2006) concluded that in many urban cities the dropout rate of African American males was close to 50% and in some areas it rose to 70%. He
found that with this population of students they have historically had poor academic achievement; and this has been a result of higher suspensions, disciplinary infractions and larger percentages of these students assigned to special education. Davis also attributed the lack of resources provided to crowded, urban schools as being a major cause of the high dropout rate in urban centers.

Sum and Harrington (2003) reported that students who leave high school without finishing were four times more likely to be arrested than their peers who finished high school, and 82% of the prison population was high school dropouts. Carpenter and Ramirez (2007) found that students who are held back and have a high number of suspensions are at a higher risk of being a high school dropout. A student who is retained for a grade is also at a higher risk of dropping out of high school, and in a study by Kleinfeld (2009) she found that one in ten black male students had been retained for at least one grade.

Family composition has been shown to impact a student’s ability to persist in high school. For Caucasian and Hispanic students, their family composition and time spent on their homework could have impacted their chance of not completing high school (Carpenter & Ramirez, 2007). Perrira, Harris and Lee (2006) determined that second generation children of immigrants had a greater chance of not successfully completing high school than first generation children of immigrants. Students who had a sibling who had previously dropped out of school were at a higher risk of dropping out of high school themselves (Carpenter & Ramirez, 2007).

Morgatto (2008) concluded that if students have access to Algebra, they will have access to higher level math classes and thus is an issue of equality where minority
students are concerned. She suggested that if all students have equal access to Algebra, then they will have a better chance of being prepared for the college or career of their choice.

**Gender.** Sum and Harrington (2003) and Bushweller (2004) reported there were higher numbers of male students who were considered to be at-risk of dropping out of high school than female students. Sum and Harrington (2003) noted that over a course of five years from 1997 through 2001, an average of 276,000 men dropped out of high school compared to the 220,000 females who dropped out. This suggested a growing achievement gap between America’s female and male populations, and more young men had to begin to graduate from high school in order to see the dropout crisis come to a close (Sum & Harrington, 2003; Kleinfeld, 2009).

Kleinfeld (2009) determined that girls who were considered to be at-risk of dropping out of high school had lower self esteem and lower achievement in the math and science courses in which they enrolled. She found that boys were more likely to not complete their homework which frustrated teachers and negatively impacted their grades. Female students were also more connected to the school by participating in school activities. In her study, she found that 8% of male students were held back a grade compared to 5% of the females. Male students were also suspended and expelled from school more than female students (Kleinfeld, 2009).

Carpenter and Ramirez (2007) found that gender had a large impact on whether or not Caucasian and Hispanic students were able to persist and complete high school, but they did not find the same thing true for African American students. Brown and
Rodriguez (2009) concluded that there is an escalating problem in the United States as the dropout rate in continuing to rise, especially among Hispanic males.

Understanding of Mathematics

The AEIS report published by the Texas Education Agency (2011) revealed that 56% of students considered to be at-risk of dropping out of high school passed the Texas Assessment of Knowledge and Skills (TAKS) compared to the 76% of the total population of students who passed. As shown in Table 1, the academic achievement gap between students considered at-risk of dropping out of high school and the general population was exemplified in the area of mathematics at the high school level, with the greatest difference between the scores of at-risk and non-at-risk students being in the ninth grade.

Table 1

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<th>Grade Level</th>
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<td>80</td>
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</tbody>
</table>

Note: Adapted from the “Academic Excellence Indicator System” by the Texas Education Agency, 2010 and 2011.

Baker, Clendaniel, and Reig (2006) noted that the No Child Left Behind (NCLB) legislation’s emphasis on student performance on standardized tests has led to the need to help low performing students improve test scores with tutorial sessions. Students considered to be at-risk are not performing at the same level as their peers; therefore,
there is a great need to determine instructional approaches which support the academic achievement of students considered to be at-risk, especially in the area of mathematics (Lalley & Miller, 2006). For every three students who begin the ninth grade, one student will not graduate with his class; and even though mathematics may not be the reason for the student to drop out, it is the most commonly failed course (Steen, 2007).

According to Orfield (2004), students who have chosen to drop out of high school have paid a very large price for leaving without finishing their high school diploma. These individuals have greater difficulty in finding employment; and even when they have been able to find employment, they often make considerably less income than their peers who have a high school diploma. The majority of high school dropouts received failing grades in mathematics classes and performed poorly on standardized tests (Menzer & Hampel, 2009).

Khazanov (2011) determined that students who struggle in the area of mathematics began to struggle in the elementary years; and as the years went on, the gaps in the students understanding of mathematics continued to widen. He found that students who struggled in the area of mathematics were not able to approach a problem in a systematic way; and that as the amount of time they spent struggling with the math, they began to think of themselves as not capable of doing the work.

**Importance of Algebra.** Silver, Saunders and Zarate (2008) reported that if students pass Algebra I, during their ninth grade year, they have a considerably higher chance of graduating from high school. They found that 70% of students who passed Algebra I in the ninth grade graduated from high school. Yet, only 35% of the students who did not pass Algebra I in the ninth grade graduated from high school.
The mathematics classes a student completes in high school will impact the student’s academic achievement and the capability to enter into postsecondary schools and professional programs (Schiller & Muller, 2003). Algebra is considered to be the gatekeeper course for advanced study in both science and mathematics (Morgatto, 2008; Schiller & Muller, 2003; Spielhagen, 2006). Students who successfully completed algebra and in turn completed higher level math classes were more likely to attend college than students who only completed lower level courses (Morgatto, 2008).

**Lack of support provided.** Crawford and Ketterlin-Geller (2008) argued that at-risk students are often identified but rarely receive additional academic services. There appears to be frequent extensive progress monitoring of at-risk students where data were gathered; goals were set; and performance was evaluated over time. However, additional academic support should have been provided to students who were considered at-risk of dropping out of high school beyond the identification and monitoring of the students’ progress. Therefore, there is a great need to determine instructional approaches which support the academic achievement of students considered to be at-risk of dropping out of school.

Silver, Saunders and Zarate (2008) noted it is extremely important to provide academic support to students who are considered to be at-risk of dropping out of high school especially during the ninth grade year in their algebra course. It is important to determine what instructional and support strategies are beneficial to at-risk students in order to allow them to be successful in all of their math classes. Lan and Lanthier (2003) determined that the transition year to high school is a critical time for the student to receive interventions in order to help them persist through high school.
Brown and Rodriguez (2009) found that students who are considered to be at-risk of dropping out of high school do not know how to appropriately advocate for themselves, and they often do not have the parental support to help advocate for them. They found that many students felt as if the school did not care about them or provide them the necessary resources to help them persist in school.

**Limited exposure to instruction.** Decapua and Marshall (2011) noted that a number of students at-risk of dropping out of high school are students who have immigrated to the United States and as a result are English language learners (ELL’s). These students, especially those who entered at the secondary level, have had limited amounts of time to master the language and academic content in order to be successful in the educational system. In general, students who are recent residents of the United States have to adapt to the western style of schooling as well as learn an entirely new set of vocabulary to begin to understand the academic concepts presented. For this population of students to be engaged in the educational process, there must be an immediate relevance or a way for these students to see how the learning would ultimately benefit their future. Unfortunately, many of these students do not see the relevance; and therefore, they fall further behind their classmates or eventually drop out of school.

Tapper (2008) reported that a number of at-risk students were students who have attended a number of schools throughout their educational career. Consequently, a student who has moved consistently is often not able to effectively piece together mathematical concepts presented at each school at which the student was enrolled (Tapper, 2008; Teachman, Paasch, & Carver, 1996). Tapper noted the students’ teachers often believed that the student had a math disability; when in reality, it was the lack of
consistent instructional exposure. Additionally, many students who are considered to be at-risk of not completing their high school education have had attendance which is inconsistent; and thus, these students missed a large amount of instruction which also impacted their understanding of mathematics (MacMath, Roberts, Wallace & Chi, 2009).

**Student learning and motivation.** Decapua and Marshall (2011) reported that many students who were at-risk of dropping out of high school were more successful in their academic endeavors when they were able to see relevance in their studies. MacMath et al. (2009) presented similar conclusions in their study which revealed how integrated units of curriculum increased the level of motivation among students, particularly those students considered to be at-risk. In the school studied by these authors, students were offered a choice between two different courses of instruction. Students were able to enter into academic courses and applied courses. Academic courses were the traditional courses used to prepare students for acceptance and entrance into college. Applied courses were to prepare students for community colleges, workplace preparation or trade schools, in an attempt to meet the needs of all students. Unfortunately, they noted, many schools only provide quality instruction to those students who plan to enter college when it is critical to provide all students knowledge and skills to enable them to pursue their individual postsecondary goals. Students were more likely to persist in school if they were involved in school activities, had higher self-esteem and were more motivated to complete their school work (Kleinfeld, 2009; Lan & Lanthier, 2003).

**The Role of the Teacher**

Menzer and Hampel (2009) suggested that teachers do not always work to improve student engagement or the success of students who are at-risk of dropping out.
Teachers in their study did not teach content or assess students in different ways in order to support the academic needs of varying populations of students.

**Teacher expectations.** Wilcox and Angelis (2011) reported the role of teacher expectations in closing the academic achievement gap among students, especially in the area of mathematics. Rigor and high expectations by teachers were crucial to help at-risk students perform at a higher level. At-risk students should be challenged by existing in a climate full of high expectations and opportunities to succeed in honors or advanced placement courses. These high expectations and challenging academic settings cannot exist without the necessary support for the at-risk students.

Knesting (2008) inferred that students who dropped out of school did not believe they had teachers who cared or were invested in their learning. She determined that students who felt welcomed and safe in their learning environment were more willing to take educational risks. Knesting found that committed and caring teachers had a greater impact on a student deciding to stay in school than any academic support provided to at-risk students. She found that at-risk students responded well to teachers who believed in a student’s ability to succeed academically and communicated this belief to the students. Knesting asked students who had considered dropping out of school what their reasons for staying in school were and the main reason among all students was having teachers who cared. The students commented how the teachers who genuinely cared about them expected every student in his or her classroom to be successful regardless of their ability level, background or future plans. Students described teachers who did not ask where their homework was, did not ask students questions and did not seem excited about the material they were presenting as teachers who did not care and contributed to students
wanting to drop out of school. Teachers cannot assume students know they care, but they must communicate this to the students each day by being supportive and respectful to students (Knesting, 2008; Lee & Burkam, 2003).

Stearns, Moller, Blau and Potochnick (2007) reported that teachers were influenced by the retention status of a student. They suggested that teachers expected less of these students and did not place high academic expectations for their students. Therefore, they put much less effort into reaching this population of student. It was important for teachers to have high expectations of all students, regardless of whether or not the student had been previously retained.

Hiring quality teachers. Menzer and Hampel (2009) revealed the importance of finding teachers who support the academic needs of at-risk students. These teachers must become more knowledgeable about the strategies and techniques that are successful for this population and must implement these strategies on a more consistent and wide spread basis. Clement (2009) found how behavior based interviewing had the potential to improve the quality of teachers hired. Through questions which revolve around the experiences of the candidates, the interviewer is able to determine if the candidate is suitable for teaching. It is important to determine the characteristics which will support the academic success of at-risk students in mathematics and then be able to formulate interview questions based on these characteristics.

A teacher with high performance evaluation scores will have students performing at a higher level than those with a lower performance evaluation (Milanowski, 2004). Effective teachers also take responsibility for ensuring their students achieve at least one year of academic progress as measured by standardized tests (King & Watson, 2010).
**Supplemental programs.** Ysseldyke, Betts, Thill, and Hannigan (2004) described how a normal sixth grade classroom in a large urban school district can have a range of student performance in math of nine and a half years. It was the teacher’s responsibility to teach to this wide range of students. In order to reach all of the students in the classroom, it was important for teachers to have access to an instructional program which allowed teachers to meet the needs of such a diverse group of students in a single setting. When teachers were allowed to use an instructional management system such as Accelerated Math, it allowed them to monitor student progress and adapt math instruction which resulted in greater gains in math achievement for all students. The components of the program included instant feedback on student performance and an individualized pace for each student in the classroom.

Steen (2004) found that teachers of all subjects must support a student’s understanding of mathematics for the achievement gap to close. When students regularly practice and communicate mathematics, in all subjects, students will begin to understand the usefulness and importance of learning mathematics. In Steen’s study, many teachers not familiar with the math curriculum and instructional expectations communicated their own fears and struggles with the concepts to students. When this fear was communicated, it tended to intimidate and deter students from truly understanding the concepts, especially those considered to be at-risk. When teachers from all subjects incorporated some sort of mathematics into their curriculum, it helped students to see relevance and become more interested in the concepts. This also helped fight boredom which was a primary cause of students dropping out of school.
Impact of schools. Knesting (2008) determined that greater attention should be given to the role schools and the leadership of schools played in a student’s decision to drop out of school or stay in school. Spielhagen (2006) noted how students were often tracked in their math courses; and as a result, once a student was placed on a particular track, the student remained on that track unless there was teacher or parental intervention. Often, parents in lower socioeconomic schools do not intervene in the placement of their student. As a result, the student’s academic needs are not met. Students with parents who are the least engaged in their student’s education are those who traditionally have opted out of algebra (Steen, 2007). It is important for schools to match students with teachers who will best serve the student’s academic needs and make sure students with special needs or who are considered to be at-risk are placed with teachers who are prepared and capable of supporting them instructionally (Wilcox & Angelis, 2011).

Students who attend smaller schools are less likely to quit school when compared to students who attend larger high schools (Werblow & Duesbery, 2009; Lee & Burkam, 2003). Werblow and Duesbery (2009) found that students enrolled in a high school with more than 2,091 students were almost twice as likely to drop out of high school as students who attended a school with less than 667 students. Their study also determined that students who attend high schools with more than 2,592 students or less than 674 students have the largest gains in mathematics achievement, and students enrolled in medium sized schools have smaller math gains. While the size of the school can impact how much a student learns in mathematics, the impact of the school size is much less when compared to the impact a student’s socioeconomic status or ethnicity has over a student’s achievement in mathematics.
Ysseldyke, Betts, Thill, and Hannigan (2004) indicated that schools which provided math curriculum which was challenging and provided ongoing and intense professional development to teachers with time for collaboration and planning had great gains in student achievement in mathematics. Having master teachers and math specialists helped improve the academic performance of at-risk students. Klem and Connel (2004) inferred that schools which provided support programs to students were more likely to keep the students engaged and connected to school.

Knesting (2008) found that students at-risk of dropping out of high school did not believe that school administrators expected or wanted all students to graduate. She suggested the importance of school administrators seeking out students who struggled academically to ask them why they wanted to leave and what support would help them stay in school. Small actions by the adults in schools can have a great impact on a student’s decision to stay in school or drop out. Educators must accept the responsibility of making the necessary changes within its own structure to support at-risk students and increase the likelihood that a student will finish his or her education. Student characteristics are blamed for a student dropping out of school, but educators can positively influence a student’s persistence in his or her education (Brown & Rodriguez, 2009; Fredricks, Blumenfeld, & Paris, 2004; Lan & Lanthier, 2003).

Stearns, Moller, Blau and Potochnick (2007) reported how students who repeat a grade are much more likely to drop out when compared to their continuously promoted peers. Students who are retained have lower self-esteem and have fewer academic related resources available. It was the responsibility of educators to reach out to these students to help build a relationship with this population because previously retained students often
viewed the school as intimidating. These students avoided any contact beyond what was necessary with the school.

**The Role of Relationships**

Students who have a strong relationship with their teachers often have higher academic achievement than students who do not have teachers with whom they feel a connection in school (Pianta & Stuhlman, 2004; Lee & Burkam, 2003). If students feel connected to their teachers, they will be more self-directed and confident in their own learning when compared to students who feel their teachers are not as supportive (Creasey, Jarvis & Knapcik, 2009). Behavior, academic achievement and attendance have been shown to improve when students had a positive relationship with their teacher and felt as though they were in a safe and caring environment (Furrer & Skinner, 2003).

**Previous relationship struggles.** Brown and Rodriguez (2009) found that students feel like adults are the gatekeepers of the curriculum, and many times adults use this power to exercise their authority over students. Over the course of many years, this impacted the engagement of many students; but in the case described by Brown and Rodriguez, the adults in the school did not attempt to intervene or express concern when students did not continue to engage in their schoolwork. They found in many schools serving a high number of students who are at-risk of dropping out of school there are low expectations, a lack of caring, and stereotypes from the teachers who are overburdened themselves.

Klem and Connell (2004) found that students traditionally become less engaged as they progress through their years in school, and by the time a student has reached high school there are as many as 60% of students who have become disengaged. In their study,
more elementary students felt like they had a positive relationship with their teachers when compared to both middle school and high school students.

**Positive student – teacher relationships.** Lan and Lanthier (2003) determined that students who had positive relationships with their peers and teachers were more likely to persist in school. Students, who saw teachers as a valuable resource and receive assistance and guidance from these teachers, could reduce the chance of these students dropping out of high school by 50%, especially for students who have experienced previous academic failure (Croninger & Lee, 2001).

**Student needs.** Brown and Rodriguez (2009) found that many students who had dropped out of school did not represent the typical idea of a dropout as they were not students who were depressed, helpless, and struggling academically. They found that many students who were dropping out were average academically. Klem and Connell (2004) concluded that when students were provided with a well structured learning environment where high expectations were communicated to the students, the students perceived the teacher as being one who genuinely cared about them and their future. They also found that teachers were giving more time and attention to students who were not engaged in the learning with the belief that through more attention, the students would become engaged.

**Caring learning environment.** Klem and Connell (2004) reported that students need to know the adults in the school care about them. They need to feel confident in their own decision making ability and trust that the work given to them by their teachers will have some relevance to their lives. Students need to understand the consequences for their actions in the classroom, and the teacher should have consistent consequences.
When students understand they are supported and cared about at school, they were more likely to have a positive attitude about school and were more academically engaged (Klem & Connell, 2004).

Wentzel (2002) determined that teachers were characterized by their expectations, negative feedback, and interest in the subject matter, fairness and rule setting. She found that if students knew they had a supportive teacher, they were more likely to be interested in the class and would have better behavior. Middle school students who were able to see that teachers behaved in a caring and supportive way were more likely to be engaged in academic activities (Wentzel, 2002).

**Improving academic achievement.** Klem and Connell (2004) reported that when students felt like they had the support of their teacher, they were more engaged in learning and in turn were able to persist through school. Fowler, Banks, Anhalt, Der, and Kalis (2008) determined the quality of a student teacher relationship is influenced in part by a student’s behavior and impacts the teacher’s academic assessment of the student. Their study found that poor relationships between a teacher and student were associated with lower academic performance.

**Motivation.** Wentzel (2002) found that students were more motivated to perform academically when they were expected to reach their full potential. When students are appropriately challenged academically, they will be more motivated than when a teacher communicated low expectations of their academic ability. Students are not motivated when the teacher provides consistent negative feedback. Wentzel also found that when a student discovered that the teacher was caring, compassionate and had high expectations, the student did not have to be interested in the academic content to want to perform well.


**Teacher beliefs.** Rosenfeld and Rosenfeld (2008) reported the importance of having the teacher communicate his/her beliefs about the student’s ability to learn and that the teacher’s beliefs were able to help that student learn. Klem and Connell (2004) determined that students need to understand that teachers know about them and care about their performance at school. Students needed to feel supported and understand what the teachers expect from them regarding their academic progress and conduct. Their study revealed that with supportive relationships with the teacher, students had a positive attitude toward their school work and were overall more satisfied with school.

Students who feel like they have teachers who support them and believe they will be able to successfully complete a task are often able to do so because they have teachers who set goals which challenge them. They work hard to achieve the challenging goals, continue to work in the face of setbacks and are able to cope with emotional stress (Ross & Gray, 2006). Wayne and Youngs (2003) found that students from a low socioeconomic background have fewer teachers who are supportive and who do not hold many of the characteristics of a quality educator.

**Student engagement.** The study by Klem and Connell (2004) also revealed that students who had a positive relationship with their teacher were more engaged in academic learning. By the time students entered into high school, there were anywhere from 40% to 60% of them who were disengaged from school in all areas of the country. Although, they found that if a student was kept engaged in learning, the student would be much less likely to drop out of school. They determined that teacher support was crucial in keeping students engaged in learning. Students who felt like they had teachers who
cared about them and were involved in their lives were found to persist through school and experienced a higher graduation rate (Klem & Connell, 2004).

**Summary**

The Texas Education Code defines the indicators which will identify a student as being at-risk of dropping out of high school (Texas Education Agency, 2009a). Beyond these indicators, there are certain characteristics which many students who are considered at-risk of dropping out of high school have in common. Students who come from a low socioeconomic background are apt to halt their education early (Arnold & Doctoroff, 2003; Sum & Harrington, 2003; Tapper, 2008). There are more male students than female students who leave school before finishing (Carpenter & Ramirez, 2007; Sum & Harrington, 2003). Students who are considered to be at-risk of dropping out of school are not performing at the same level academically as those students who are not considered to be at-risk (Arnold & Doctoroff, 2003; Brown & Rodriguez, 2009; Carpenter & Ramirez, 2007; Lalley & Miller, 2006; Kleinfeld, 2009; Sum & Harrington, 2003; Texas Education Agency, 2011).

The Texas Education Agency (2011) showed that students considered to be at-risk of dropping out of high school scored considerably lower on the math portion of the TAKS test. Students who do not successfully complete Algebra I during their ninth grade year were found to be at a higher risk of dropping out of high school (Menzer & Hampel, 2009; Morgatto, 2008; Schiller & Muller, 2003; Silver, Saunders & Zarate, 2008; Spielhagen, 2006). A student’s ability to persist and successfully complete Algebra I during their ninth grade year has lifelong implications as the mathematics courses a
student has taken in high school will impact their ability to complete postsecondary education (Morgatto, 2008; Schiller & Muller, 2003).

The teacher played a large role in encouraging a student’s persistence through high school and was shown to help close the academic achievement gap for some students in the area of mathematics (Knesting, 2008; Wilcox & Angelis, 2011). Students who had teachers who cared about them were more likely to succeed academically (Brown & Rodriguez, 2009; Fredricks, Blumenfeld, & Paris, 2004; Knesting, 2008; Lan & Lanthier, 2003). Students who had a positive relationship with their teacher felt more connected to the school and their behavior, academic achievement and attendance were shown to improve as a result (Creasey, Jarvis & Knapcik, 2009; Furrer & Skinner, 2003; Lee & Burkam, 2003; Pinata & Stuhlman, 2004).

Chapter II reviewed the literature by differentiating between the characteristics of students who are considered to be at-risk of dropping out of high school, how they understand mathematics, the teacher’s impact on their understanding of mathematics and the role of relationships. In Chapter III, the methodology is presented and is followed by the findings in Chapter IV. A summary of the study with the conclusions and implications for practice as well as any recommendations for future research are discussed in Chapter V.
Chapter III

Methodology

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. Algebra I is considered to be the “gateway” class to high school, and a student’s persistence in high school is much more likely if he successfully completes the course during the first attempt taking the class (Silver, Saunders, & Zarate, 2003; Spielhagen, 2006; Stearns, Moller, Blau & Potochnick, 2007). The teacher plays a large role in encouraging a student’s persistence through high school and has been shown to help close the academic achievement gap for some students in the area of mathematics (Knesting, 2008; Wilcox & Angelis, 2011). Therefore, it is important to identify if an at-risk student’s perception of having a positive relationship with his/her Algebra I teacher correlates to higher academic performance.

This chapter describes the methodology used to acquire and analyze the data needed to test the research questions in this investigation. This description includes the research questions, research design, population/participants, instrumentation, data collection procedures and the statistical methods used to analyze the data.

Purpose of the Study and Research Question

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. The related research questions are:
1. Is there a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test?
2. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test?
3. Is there a relationship between the perceived level of student/teacher connectedness and attendance in Algebra I?
4. Is there a relationship between the perceived level of student/teacher anxiety and attendance in Algebra I?
5. Is there a relationship between the perceived level of student/teacher connectedness and performance on the STAAR Algebra I test when controlling for attendance?
6. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test when controlling for attendance?

**Research Design**

A correlation study design was used for this study to determine if there was a relationship between student perceptions of relationships with their math teachers and their performance on an end-of-year standardized exam administered by the state of Texas. Predictor variables included students’ perceived connectedness and anxiety about their relationship with their math teacher, as measured by Student-Teacher Relationship Scale (Creasey, Jarvis, & Knapcik, 2009), and the students’ STAAR End of Course scores served as the outcome measure. Attendance data for Algebra I classes was also
collected and used as a covariate, which was measured by the number of days a student was present in class.

**Sample**

The population of students in the study included all students who took Algebra I during the 2011–2012 school year as first time ninth graders at three high school campuses in a large district in Southeast Texas, and who were considered to be at-risk of dropping out of school based on the indicators described by the Texas Education Code (Texas Education Code, 2009a). The entire population of students for this district was 289 students. An *a priori* power analysis (Cohen, 1988) was conducted to determine the sample size needed to detect a medium effect (*r*=0.3) with 95% confidence (*α*= .05). The results of the power analysis suggested a sample size of 138 was a sufficient sample size for the study, the researcher oversampled by 20% (*n*= 166) to account for surveys that were not completed or returned.

The researcher used simple random sampling to select participants for the study in order to ensure that all members of the population had equal probability of being chosen to participate (McMillan & Schumacher, 2010). The student’s school identification numbers were entered into the Statistical Package for the Social Sciences (SPSS) and the researcher used the program to randomly select 138 students out of the 289 students considered to be at-risk of dropping out of school to participate in the study (Pallant, 2007).

Once the sample of students was identified, a letter with a parental consent form was mailed to each of the students’ home explaining the purpose of the study and notifying the parents that their student was eligible to participate in this study (see
Appendix A). The researcher also used a call out system that allowed the researcher to input the phone numbers to the students invited to participate in the study and a message was recorded to let the parents know to anticipate receiving the letter. The students and parents were informed that all information would be confidential. Only the researcher would have access to the students’ information, and at no time would students put their names on any information. A week after the initial mail out, the researcher made phone calls to all the parents of the students who had not returned the parental consent form to answer questions and remind them of their student’s opportunity to participate in the study.

There were 166 students who were invited to participate in the study and 138 students returned a parent permission slip in order to participate which yielded a return rate of 83%. Table 2 indicates the breakdown of participants by special populations and includes the percentages for the population of this study. Table 3 indicates the ethnic breakdown of the students who participated by taking the survey and includes the percentages for the population.

Table 2

<table>
<thead>
<tr>
<th>Special Population</th>
<th>Participants</th>
<th>Population</th>
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<tbody>
<tr>
<td>Special Education</td>
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<td>8.3</td>
</tr>
<tr>
<td>Limited English Proficient</td>
<td>5.1</td>
<td>8.0</td>
</tr>
<tr>
<td>Male</td>
<td>55.1</td>
<td>63.3</td>
</tr>
<tr>
<td>Female</td>
<td>44.9</td>
<td>36.7</td>
</tr>
</tbody>
</table>
Table 3

Ethnicity of Students

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Participants</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaskan</td>
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<td>1.0</td>
</tr>
<tr>
<td>Asian</td>
<td>.7</td>
<td>.7</td>
</tr>
<tr>
<td>Black/African American</td>
<td>16.7</td>
<td>2.7</td>
</tr>
<tr>
<td>Hispanic</td>
<td>44.9</td>
<td>55</td>
</tr>
<tr>
<td>White</td>
<td>36.2</td>
<td>40.5</td>
</tr>
</tbody>
</table>

There were 18.1% of the students surveyed who were reached Level I: Unsatisfactory Academic Performance on the 2011 – 2012 administration of the STAAR Algebra I Test. There were 4.3% of the students who reached Level III: Advanced Academic Performance.

Instrumentation

The Student-Instructor Relationship Scale was originally created by Creasey, Jarvis and Knapcik to measure the perceived relationship college students had with their instructors (Creasey, Jarvis & Knapcik, 2009). The instrument consists of 36 Likert-scaled items in which students responded to statements that described how connected they felt to their instructor and how anxious they were about their relationship with their teacher (see Appendix B). The seven-point Likert scale ranges from Disagree Strongly to Agree Strongly. McMillan and Schumacher (2010) reported the reliability of a survey measures how consistent the instrument is in measuring the variables over time and validity is described as how consistently the instrument measures what it is intended to measure. According to Creasey, Jarvis & Knapcik, (2009) the reliability, as measured by Cronbach’s alpha, had an internal consistency of .89. In the current study, the Cronbach
alpha coefficient was .73. The higher the value of Cronbach’s alpha, the more consistent the individual item scores vary with the score on the scale (Salkind, 2008). A factor analysis was conducted to determine how well items are related to one another (Salkind, 2008) and revealed two domains that loaded well (at .50 or greater), the first was Instructor Connectedness where higher scores reveal stronger feelings of connectedness and lower scores reveal a less close relationship with the teacher. Students who felt connected to their teacher felt the teacher was supportive and nonthreatening (Creasey, Jarvis & Knapcik, 2009). The second domain is Instructor Anxiety where higher scores disclose an anxiety about the student’s relationship with his/her teacher, and lower scores reveal less anxiety about the student’s relationship with his/her teacher (Creasey, Jarvis & Knapcik, 2009).

The researcher obtained permission from the authors of the instrument to make minor changes for the participants in the current study. For example, the word “instructor” was changed to “teacher” in order for high school students to better understand the statements in the survey (see Appendix C for permissions). A focus group of students was formed using 10 students who were from the population of students, but not selected to participate in the study. The researcher sat down with the students to discuss their understanding of the questions in order to ensure the students comprehended the statements in the survey. The students understood all of the questions asked and no additional changes were made to the wording of the survey.

**Data Collection Procedures**

The Student-Teacher Relationship Scale was used to determine the student’s perceived relationship with his/her Algebra I teacher by measuring how connected the
students felt to their teacher and how anxious they felt about their relationship with their teacher. The Institutional Review Board (IRB) application was submitted to the university as well as the school district and permission was granted for the researcher to research using human subjects (Appendix D)

The students who were selected randomly were given parental permission to participate in the study. They were pulled from their second period class and reported to a large group instruction room on campus. The survey was administered by an assistant principal on each campus to ensure the researcher’s presence did not impact the students taking the survey. The assistant principal was given a protocol to read to the students as the survey was administered. The protocol included information regarding the procedures to complete the survey as well as the importance of completing the survey accurately (see Appendix E). Students were informed that all data and personal records would be destroyed at the conclusion of this research.

Participating students were given a number to put on their survey and only the researcher knew what number the students were assigned. This allowed the students’ information to remain confidential. The students were not timed, and once the students were finished with the survey the administrator checked the surveys to ensure the students answered all of the questions. If students did not answer all of the questions on the survey, they were instructed to finish answering all the questions before they were allowed to return to class. Once the students had finished answering all questions on the survey, they were released back to class. After the surveys were returned, the researcher checked each survey for completion and compliance with the directions for completing the instrument. The researcher collected the data regarding the student’s STAAR Algebra
I End of Course scores from the district’s Eduphoria program. Eduphoria is the management system for accountability data, curriculum and appraisals used by the district and holds all the data regarding local and state accountability tests. In order to determine the number of days a student was present in his/her Algebra I course, the student’s schedule from the 2011 – 2012 school year was retrieved using the TEAMS program. TEAMS is the district’s grade book, attendance and discipline management system used by the district. This allowed the researcher to determine the number of days a student was present during the period the student was enrolled in Algebra I during the 2011- 2012 school year using the TEAMS program.

Data Analysis

The data from the Student-Instructor Relationship Scale (Creasey, Jarvis & Knappick, 2009) were entered into the Statistical Package for the Social Sciences (SPSS) software for data analysis. The students’ STAAR Algebra I End of Course scores were exported to Excel from the district’s Eduphoria program and were then exported to SPSS. The students’ attendance information from Algebra I was entered into SPSS software for data analysis. In order to maintain confidentiality, no names or numbers were used to identify students in the analysis of the data. Once all of the student survey scores, STAAR Algebra I scores and attendance data were input into SPSS, any identifying information was deleted. The researcher used the Pearson correlation coefficient ($r$) to analyze the data, and the level of significance was set at the .05 level for all analyses. The correlation analysis investigated if a relationship existed between the perceived relationship a student has with his/her teacher and the student’s academic performance as measured through the STAAR End of Course scores and attendance. If a relationship
existed, the strength of the relationship was also determined using correlation analyses. In other words, the correlation coefficient determined if the students who perceived to have a strong relationship with their teacher have higher academic performance (McMillan & Schumacher, 2010).

Research questions one through four were analyzed using correlation analyses. The independent variable was the students’ scores on the questions relating to instructor connectedness or anxiety on the Student-Teacher Relationship Scale (Creasey, Jarvis & Knapcik, 2009). The dependent variable was the students’ scores on the STAAR Algebra I EOC or the number of days a student was present in their Algebra I course during the 2012 – 2013 school year.

For research questions four and five a partial correlation was conducted to analyze these questions, which allowed the researcher to control for the possible effects of a confounding variable and allowed a more accurate representation of the relationship between the students’ scores on the Student-Teacher Relationship Scale and their STAAR Algebra I EOC scores (Pallant, 2007). The independent variable was the students’ scores on the questions relating to instructor anxiety on the Student-Instructor Relationship Scale (Creasey, Jarvis & Knapcik, 2009), and the dependent variable was the students’ scores on the Algebra I STAAR EOC when controlling for their attendance in the student’s Algebra I class.

Summary

This chapter presented a discussion of the research questions, design of the study, and the selection of the population/participants. This chapter also included information
about the data collection procedures implemented as well as the statistical methods used to analyze the data.
Chapter IV

Analysis of Data

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. The related research questions are:

1. Is there a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test?

2. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test?

3. Is there a relationship between the perceived level of student/teacher connectedness and attendance in Algebra I?

4. Is there a relationship between the perceived level of student/teacher anxiety and attendance in Algebra I?

5. Is there a relationship between the perceived level of student/teacher connectedness and performance on the STAAR Algebra I test when controlling for attendance?

6. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test when controlling for attendance?
This chapter describes the sample of students who participated in the study and reports the findings for all research questions. This includes a description of the analysis, the statistical results as well as an explanation of the results.

**Presentation of the Findings**

This section includes a description of the analyses conducted, including assessments of the data prior to analysis, and the findings. It is organized by the research questions that guided the current study.

**Research question one.** Research question one asked if there is a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test. In order to answer this question, the students’ \( (n=138) \) perceived level of student/teacher connectedness, as measured by the score on the Student Teacher Relationship Scale \( (M=46.51, SD=15.15) \), and the student’s performance on the 2011 – 2012 administration of the STAAR Algebra I test \( (M=27.03, SD=7.94) \) were analyzed using Pearson’s correlation analysis in SPSS. The level of significance was set at the .05 level a priori for the analysis (McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality and extreme outliers. A histogram for the scores on the Student Teacher Relationship Scale showed the scores to be normally distributed and the Normal P-P Plot, which plotted each score against the expected value from the normal distribution, provided a reasonably straight line with no outliers, which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007). The correlation analysis found a statistically significant positive correlation between the two variables, \( r(136)=.246, \)
Although the relationship is small, based upon the correlations coefficient 
(McMillan & Schumacher, 2010), higher levels of student/teacher connectedness appear 
to be associated with higher performance on the STAAR Algebra I assessment. 

This is in alignment with previous research regarding the impact of relationships 
on the academic achievement of students which determined that students who have a 
strong relationship to their teacher and who feel connected will have higher academic 
achievement than students who do not have the same connection (Creasey, Jarvis & 

**Research question two.** Research question two asked if a relationship existed 
between the perceived level of student/teacher anxiety and the student’s performance on 
the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test. In order 
to answer this question, the students’ (n = 138) perceived level of student/teacher anxiety 
as measured by the score on the Student Teacher Relationship Scale (M = 17.77, SD = 
8.394) and the student’s performance on the 2011 – 2012 administration of the STAAR 
Algebra I test (M = 27.03, SD = 7.94) were analyzed using Pearson’s correlation analysis 
in SPSS. The level of significance was set at the .05 level a priori for the analysis 
(McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality 
and extreme outliers. The histogram for the scores on the Student Teacher Relationship 
Scale showed the scores to be reasonably normally distributed since it followed the shape 
of the normal curve and the Normal P-P Plot which plotted each score against the 
expected value from the normal distribution provided a reasonably straight line with no
outliers which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007).

The relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test was investigated using a Pearson’s correlation coefficient. There was not a correlation between the two variables, \( r(136) = -0.082, \) \( p = 0.340, \) which suggests that a statistically significant relationship does not exist between the levels of student/teacher anxiety and a student’s performance on the STAAR Algebra I assessment. This means that the students level of perceived anxiety regarding the relationship with the Algebra I teacher is not associated with higher performance on the STAAR Algebra I assessment (McMillan & Schumacher, 2010).

**Research question three.** Research question three asked if there is a relationship between the perceived level of student/teacher connectedness and the student’s attendance in Algebra I during the 2011 – 2012 school year. In order to answer this question, the students’ \( (n = 138) \) perceived level of student/teacher connectedness as measured by the score on the Student Teacher Relationship Scale \( (M = 46.51, \) \( SD = 15.15) \) and the student’s attendance in Algebra I as measured by the number of days a student was present \( (M = 164.72, \) \( SD = 8.405) \) were analyzed using Pearson’s correlation analysis in SPSS. The level of significance was set at the .05 level a priori for the analysis (McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality and extreme outliers. The histogram for the scores on the Student Teacher Relationship Scale showed the scores to be reasonably normally distributed since it followed the shape of the normal curve and the Normal P-P Plot which plotted each score against the
expected value from the normal distribution provided a reasonably straight line with no outliers which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007).

The relationship between the perceived level of student/teacher connectedness (as measured by the Student-Teacher Relationship Scale) and the student’s attendance in Algebra I (as measured by the number of days a student was present in Algebra I during the 2011 – 2012 school year) was investigated using a Pearson’s correlation coefficient. There was not a significant correlation between the two variables, \( r(136) = .165, p = .05 \), while is the level at which statistical significance was set, it suggests that a statistically significant relationship does not exist between the levels of student/teacher connectedness and a student’s attendance in Algebra I but is right at the threshold for statistical significance. This suggests that the student’s perceived level of connectedness with the Algebra I teacher is not associated with a higher attendance rate in the class (McMillan & Schumacher, 2010).

Students who generally feel more connected to school and have a positive relationship with their teacher have been shown to have higher attendance rates (Brown & Rodriguez, 2009; Creasey, Jarvis & Knapcik, 2009; Fredricks, Blumenfeld & Paris, 2004; Furrer & Skinner, 2003; Knesting, 2008; Lan & Lantheir, 2003; Lee & Burkam, 2003; Pinata & Stuhlman, 2004). Students who are considered to be at-risk of dropping out of high school have historically had inconsistent attendance which has led to these students missing large amounts of instruction. This has impacted their ability to succeed in the area of mathematics (MacMath, Roberts, Wallace & Chi, 2009).
**Research question four.** Research question four asked if a relationship existed between the perceived level of student/teacher anxiety and the student’s attendance in Algebra I. In order to answer this question, the students’ \((n = 138)\) perceived level of student/teacher anxiety as measured by the score on the Student Teacher Relationship Scale \((M = 17.77, SD = 8.394)\) and the student’s attendance in Algebra I, as measured by the number of days a student was present \((M = 164.72, SD = 8.405)\), were analyzed using Pearson’s correlation analysis in SPSS. The level of significance was set at the .05 level *a priori* for the analysis (McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality and extreme outliers. The histogram for the scores on the Student Teacher Relationship Scale showed the scores to be reasonably normally distributed since it followed the shape of the normal curve and the Normal P-P Plot which plotted each score against the expected value from the normal distribution provided a reasonably straight line with no outliers which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007).

The relationship between the perceived level of student/teacher anxiety and the student’s attendance in Algebra I was investigated using a Pearson’s correlation coefficient \((r)\). There was not a statistically significant correlation between the two variables, \(r(136) = .050, p = .562\) which means that a meaningful relationship does not exist between the levels of student/teacher anxiety and a student’s attendance in Algebra I. This suggests the perceived level of student/teacher anxiety is not associated with a higher attendance rate in Algebra I (McMillan & Schumacher, 2010). However, Furrer and Skinner (2003) found that a student’s attendance has been shown to improve when
the student felt like the teacher provided them with a safe and caring learning environment.

Research question five. Research question five asked if there is a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test while controlling for attendance. In order to answer this question, the students’ \( n = 138 \) perceived level of student/teacher connectedness, as measured by the score on the Student Teacher Relationship Scale \( (M = 46.51, SD = 15.15) \), and the student’s performance on the 2011 – 2012 administration of the STAAR Algebra I test \( (M = 27.03, SD = 7.94) \) while controlling for attendance as measured by the number of days a student was present in Algebra I \( (M = 164.72, SD = 8.405) \) were analyzed using a partial correlation analysis in SPSS. The level of significance was set at the .05 level a priori for the analysis (McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality and extreme outliers. The histogram for the scores on the Student Teacher Relationship Scale showed the scores to be reasonably normally distributed since it followed the shape of the normal curve and the Normal P-P Plot which plotted each score against the expected value from the normal distribution provided a reasonably straight line with no outliers which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007).

A partial correlation coefficient \( r \) was used to explore the relationship between the perceived level of student/teacher connectedness and a student’s performance on the STAAR Algebra I test while controlling for attendance. There was a small, positive,
partial correlation between the perceived level of student/teacher connectedness and a student’s performance $r(136) = .222, p = .009$, which suggests higher levels of student/teacher connectedness being associated with higher performance on the STAAR Algebra I test. Although the relationship is small, based upon the correlations coefficient (McMillan & Schumacher, 2010), higher levels of student/teacher connectedness appear to be associated with higher performance on the STAAR Algebra I assessment when controlling for attendance. An inspection of the zero order correlation ($r = .246$) suggested that controlling for attendance had very little effect on the strength of the relationship between these two variables.

A partial correlation was used to analyze this question in order to get a more accurate representation of the potential relationship by controlling the possible effects of the confounding variable of a student’s attendance (Pallant, 2007). Since a student who is considered to be at-risk of dropping out of high school traditionally has more inconsistent attendance (MacMath, Roberts, Wallace & Chi, 2009) it is important to investigate the relationship between the student’s perceived level of student/teacher connectedness and the student’s performance on the STAAR Algebra I End of Course exam while controlling for the student’s attendance.

**Research question six.** Research question six asked if a relationship existed between the perceived level of student/teacher anxiety and the student’s performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test while controlling for attendance. In order to answer this question, the students’ ($n = 138$) perceived level of student/teacher anxiety as measured by the score on the Student Teacher Relationship Scale ($M = 17.77, SD = 8.394$) and the student’s performance on the
2011 – 2012 administration of the STAAR Algebra I test \((M = 27.03, SD = 7.94)\) while controlling for attendance as measured by the number of days a student was present in Algebra I \((M = 164.72, SD = 8.405)\) were analyzed using a partial correlation analysis in SPSS. The level of significance was set at the .05 level a priori for the analysis (McMillan & Schumacher, 2010).

Prior to running the correlation analysis, the variables were assessed for normality and extreme outliers. The histogram for the scores on the Student Teacher Relationship Scale showed the scores to be reasonably normally distributed since it followed the shape of the normal curve and the Normal P-P Plot which plotted each score against the expected value from the normal distribution provided a reasonably straight line with no outliers which suggested a normal distribution for the student/teacher connectedness scores (Pallant, 2007).

A partial correlation coefficient \((r)\) was used to explore the relationship between the perceived level of student/teacher anxiety (as measured by the Student-Teacher Relationship Scale) and the student’s performance on the STAAR Algebra I test (as measured by the student’s performance on the 2011 – 2012 administration) while controlling for attendance (as measured by the number of days a student was present in Algebra I during the 2011 – 2012 school year). There was not a statistically significant relationship between the perceived level of student/teacher anxiety and the student’s performance on the STAAR Algebra I test \(r(136) = -.093, p = .280\). This suggests the perceived level of student/teacher anxiety is not associated with a higher performance on the STAAR Algebra I test when controlling for attendance (McMillan & Schumacher, 2010).
Summary

This chapter provided the statistical analyses of each research question included in this study. The following chapter will consist of a summary of the entire study, conclusions, implications for practice and recommendations for further research.
Chapter V
Summary, Conclusions, Implications and Recommendations

The purpose of this study was to investigate if a relationship existed between an at-risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. This chapter is comprised of an overall summary of the study which includes an overview of the problem, a review of the design of the study as well as a summary of the findings. It will also include the implications for practice and any recommendations for further research.

Summary of the Study

Students who are considered to be at-risk of dropping out of high school are identified using the indicators outlined by the Texas Education Code (Texas Education Agency, 2009a) and have a number of common characteristics not specifically identified by the code. There are a higher number of male students than female students who are considered to be at-risk of dropping out of high school and many of these students come from a low socioeconomic background (Arnold & Doctoroff, 2003; Carpenter & Ramirez, 2007; Sum & Harrington, 2003; Tapper, 2008). These students have historically had poor academic achievements and higher numbers of disciplinary infractions (Davis, 2006).

Overview of the problem. Students who are considered to be at-risk of dropping out of high school have been shown to perform below their peers academically who are not considered to be at-risk of dropping out of high school before obtaining a diploma (Arnold & Doctoroff, 2003; Brown & Rodriguez, 2009; Carpenter & Ramirez, 2007; Lalley & Miller, 2006; Kleinfeld, 2009; Sum & Harrington, 2003; Texas Education
Agency, 2011). The majority of students who dropped out of high school received failing grades in mathematics and struggled on standardized tests (Menzer & Hampel, 2009). More specifically, students who are not able to successfully pass Algebra I during their initial year in high school were found to have a higher risk of dropping out of high school (Menzer & Hampel, 2009; Morgatto, 2008; Schiller & Muller, 2003; Silver, Saunders & Zarate, 2008; Spielhagen, 2006). A student who is able to complete Algebra I during the ninth grade year will be more likely to complete high school and enter into postsecondary education (Morgatto, 2008; Schiller & Muller, 2003). Students who are considered to be at-risk of dropping out of high school scored lower on the mathematics Texas Assessment of Knowledge and Skills (Texas Education Agency, 2011).

Teachers who are caring and have a positive relationship with the students have been shown to help make students feel more connected to the school which in turn has improved the student’s attendance, academic achievement and overall behavior (Brown & Rodriguez, 2009; Creasey, Jarvis & Knapcik, 2009; Frericks, Blumenfeld & Paris, 2004; Furrer & Skinner, 2003; Knesting, 2008; Lan & Lanthier, 2003; Lee & Burkam, 2003; Pinata & Stuhlman, 2004). A teacher has also been shown to encourage a student to continue to work toward completing the high school diploma and to help lessen the achievement gap between groups of students especially in mathematics (Knesting, 2008; Wilcox & Angelis, 2011). Although, many students who are considered to be at-risk of dropping out of high school do not feel supported by teachers and have become less engaged as they progress in school (Brown & Rodriguez, 2009; Klem & Connell, 2004, Wentzel, 2002).
Since Algebra I is considered to be the gatekeeper course for a student’s success in high school and has implications for a student’s success at the postsecondary level, it is important to determine the academic support this population of student needs in order to be successful and ultimately graduate from high school. It is important to understand if there is a relationship between a student who is considered to be at-risk of dropping out of school’s perceived relationship with the teacher and the student’s academic performance in Algebra I.

**Purpose statement and research questions.** The purpose of this study was to investigate if a relationship existed between an at risk high school student’s perceived relationship with the Algebra I teacher and the student’s academic performance and attendance in Algebra I. The related research questions are:

1. Is there a relationship between the perceived level of student/teacher connectedness and performance on the State of Texas Assessments of Academic Readiness (STAAR) Algebra I test?
2. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test?
3. Is there a relationship between the perceived level of student/teacher connectedness and attendance in Algebra I?
4. Is there a relationship between the perceived level of student/teacher anxiety and attendance in Algebra I?
5. Is there a relationship between the perceived level of student/teacher connectedness and performance on the STAAR Algebra I test when controlling for attendance?

6. Is there a relationship between the perceived level of student/teacher anxiety and performance on the STAAR Algebra I test when controlling for attendance?

**Review of the study design.** A correlation study design was used to determine if a relationship existed between student perceptions of relationships with the Algebra I teacher and the student’s performance on the State of Texas Assessment of Academic Readiness (STAAR) Algebra I End of Course exam. The study measured two predictor variables, student/teacher connectedness and student/teacher anxiety, using the Student Teacher Relationship Scale while the student’s End of Course scores served as the outcome measures.

The researched randomly selected 166 students who were considered to be at-risk of dropping out of high school who took Algebra I during the 2011 – 2012 school year as first time ninth graders at three high school campuses in a large school district in Southeast Texas. Of the 166 students who were invited to participate in the study, 138 students returned the parent permission slip and were administered the survey by an assistant principal on each campus during their second period class. The researcher collected the completed surveys and used the district’s management system for accountability data to retrieve the students’ STAAR Algebra I End of Course scores and the district’s attendance program to retrieve the number of days students were present in their Algebra I class during the 2011 – 2012 school year. All of the students’ data were
entered in the Statistical Package for the Social Sciences (SPSS) and once the data were entered, all identifying information was deleted.

The researcher used the Pearson correlation coefficient (r) to analyze the data and the level of significance was set at the .05 level for all analyses. Research questions one through four were analyzed using correlation analyses while research questions five and six were analyzed using a partial correlation in order to control for attendance.

**Summary of major findings.** This study explored six research questions in an effort to determine if a relationship existed between a student’s perceived relationship with the Algebra I teacher and the student’s performance on the STAAR Algebra I End of Course test or the student’s attendance in Algebra I during the 2011 – 2012 school year. The results from the correlation analyses for each research question are given below.

**Research question one.** The first question investigated if a relationship existed between the perceived level of student/teacher connectedness and the student’s performance on the STAAR Algebra I End of Course test. The correlation analyses found a small, statistically significant positive correlation between a student’s perceived level of student/teacher connectedness and the student’s performance on the STAAR Algebra I assessment. A relationship existed between students who felt connected to their Algebra I teacher, as measured by the Student Teacher Relationship Scale, and the student’s performance on the STAAR Algebra I test. Since the correlation was a positive correlation, it showed that higher student/teacher connectedness scores correlated with higher scores on the STAAR Algebra I test.


**Research question two.** The second research question investigated if a relationship existed between the perceived level of student/teacher anxiety and the student’s performance on the STAAR Algebra I End of Course exam. The correlation analysis did not show a significant relationship between the level of student/teacher anxiety and the student’s performance on the STAAR Algebra I End of Course test. This indicates that a student’s perceived anxiety about the relationship with the Algebra I teacher does not impact the student’s performance on the STAAR Algebra I test. There is neither a positive nor negative correlation and thus higher or lower levels of perceived anxiety are not associated with higher or lower scores on the STAAR Algebra I End of Course exam.

**Research question three.** The third research question explored whether or not a relationship existed between the perceived level of student/teacher connectedness and the student’s attendance in Algebra I during the 2011 – 2012 school year. The correlation analyses did not show a relationship to exist between the level of student/teacher connectedness and the student’s attendance in Algebra I during the 2011 – 2012 school year. The lack of a significant positive or negative correlation indicates that the student’s perceived level of connectedness with the Algebra I teacher is not associated with the student attending more or less days of instruction.

**Research question four.** The fourth research question examined if a relationship was present between the level of student/teacher anxiety and the student’s attendance in Algebra I. This study did not reveal a significant correlation between the level of student/teacher anxiety and the student’s attendance in Algebra I during the 2011 – 2012
school year. This suggests a student’s perceived level of student/teacher anxiety is not associated with higher or lower attendance rates in the Algebra I class.

*Research question five.* The fifth research question investigated whether or not a relationship existed between the perceived level of student/teacher connectedness and the student’s performance on the STAAR Algebra I test while controlling for attendance. The partial correlation revealed a small, significant, positive partial correlation between the level of student/teacher connectedness and the student’s performance on the STAAR End of Course exam. This suggests that if a student feels more connected to the Algebra I teacher it is associated with higher performance on the STAAR Algebra I End of Course assessment when controlling for the student’s attendance. Further investigation into the zero order correlation determined that controlling for attendance had very little effect on the strength of the relationship between the two variables.

*Research question six.* The sixth research question explored whether or not a relationship existed between the perceived level of student/teacher anxiety and the student’s performance on the STAAR Algebra I End of Course assessment while controlling for attendance. The partial correlation did not reveal a significant relationship to exist between the perceived level of student/teacher anxiety and the student’s performance on the STAAR Algebra I End of Course test. This suggests that a student’s perceived level of student/teacher anxiety is not associated with higher or lower performance on the assessment while controlling for the student’s attendance.

**Conclusions**

The findings of this study determined that a small, positive relationship did exist between how connected a student felt to the Algebra I teacher and the student’s
performance on the STAAR Algebra I assessment administered during the 2011 – 2012 school year. This shows that if students have a stronger connection with their Algebra I teacher, it will positively impact their performance on the STAAR Algebra I assessment. In order for a student to persist through high school, it is of the utmost importance that they successfully complete Algebra I during their ninth grade year and the findings of this study validate the fact that while the relationship is small, the relationship exists between how connected a student felt to the Algebra I teacher did positively impact the student’s academic performance on the state assessment.

The reality is that students who are considered to be at-risk of dropping out of high school are struggling academically and are underperforming their non-at-risk peers specifically in the area of mathematics (Khazanov, 2011; Menzer & Hampel, 2009; Morgatto, 2008; Schiller & Muller, 2003; Silver, Saunders & Zarate, 2008; Spielhagen, 2006; Texas Education Agency, 2011). A student’s ability to persist and complete high school not only has implications for their ability to continue into postsecondary education but it has lifelong implications as it will impact their ability to obtain and maintain a well-paying job (Morgatto, 2008; Orfield, 2004; Schiller & Muller, 2008; Sum & Harrington, 2003). Algebra I has been considered to be the gateway course for advanced study in mathematics and students who pass Algebra I during their ninth grade year have a considerably higher rate of graduating from high school compared to their peers who did not pass Algebra I during their ninth grade year (Morgatto, 2008; Schiller & Muller, 2003; Silver, Sauders & Zarate, 2008; Spielhagen, 2006). Therefore it is crucially important for a student to complete Algebra I during the ninth grade year to increase the chance for that student to complete high school.
Students who are considered to be at-risk of dropping out of high school not only need additional academic support and intervention, especially during the transition year in the ninth grade, but also need adult advocates to support them since many do not have parental support nor do they know how to appropriately advocate for themselves (Brown & Rodriguez, 2009; Lan & Lantheir, 2003; Silver, Saunders & Zarate, 2008). Although, many times these students are the ones who feel least supported in the educational setting (Brown & Rodriguez, 2009; Knesting, 2008; Mezer & Hampel, 2009). Teachers play an essential role in supporting students, providing high expectations and communicating these high expectations to all of their students (Knesting, 2008; Lan & Lanthier, 2003; Lee & Burkam, 2003; Wilcox & Angelis, 2011). Students who have had positive relationships with their teachers and felt connected to their teachers were found to be more self-directed and confident in their learning and have improved academically (Creasey, Jarvis, & Knapcik, 2009; Furrer & Skinner, 2003; Lee & Burkam, 2003; Pinata & Stuhlman, 2004).

This study found that when working with students considered to be at-risk of dropping out of high school, a relationship did not exist between student/teacher connectedness or anxiety and the student’s attendance in Algebra I. The study also found that controlling for attendance had little effect on the strength of the relationship between student/teacher connectedness and the student’s performance on the STAAR Algebra I test. Therefore, if a student felt anxious about the relationship with the Algebra I teacher, this did not positively or negatively impact their performance on the state mandated exam. This finding is inconsistent with previous research. For example, there is research which has shown the attendance of students who have a strong relationship with their
teacher has improved (Furrer & Skinner, 2003) and increased the importance of determining what support and interventions are beneficial to help students considered to be at-risk of dropping out of high school to persist through the completion of their high school degree. Perhaps, other variables such as the student’s home situation or health are the reason for the student’s attendance or non-attendance in Algebra I. Based on the findings of this study, the more connected a student feels to the Algebra I teacher, the higher their performance on the STAAR End of Course test and the student’s attendance in Algebra I appears to not be related.

**Implications for Practice**

With the number of students considered to be at-risk of dropping out of high school on the rise (Arnold & Doctoroff, 2003; Sum & Harrington, 2003; Tapper, 2008), it is important for schools and teachers to determine what instructional practices and support systems can be in place to assist these students with completing their high school diploma. These students need additional support beyond what the traditional student may need and some of the support necessary for success can be provided through the teacher. Since Algebra I is such a critical course for a student to complete successfully (Khazanov, 2011; Menzer & Hampel, 2009; Orfield, 2004; Silver, Saunders & Zarate, 2008), it is important for schools and administrators to provide the appropriate structures and interventions for these students during this transition year.

**Implications for schools.** A student who is considered to be at-risk of dropping out of high school who perceives a strong connection to the Algebra I teacher has demonstrated higher academic performance on the state mandated exam. Therefore, it is important to make sure these students are provided a teacher who is able to cultivate
strong connections with the students. It is important for the teacher to understand the relevance of making students feel connected and included in the classroom (Creasey, Jarvis, Knapcik, 2009; Knesting, 2008; Wilcox & Angelis, 2011), especially in Algebra I when so many of these students have historically struggled in the area of mathematics (Morgatto, 2008; Schiller & Muller, 2003; Speilhagen, 2006; Silver, Saunders & Zarate, 2008). Schools should intentionally schedule students into teachers’ classrooms who understand the needs of this population of student and are able to help these students ultimately feel connected. If a school does not already have teachers in place to work specifically with this population of student, the school should focus on hiring the appropriate teachers who are passionate and capable of fostering the necessary connections with these students while maintaining and communicating high expectations for these students (Wilcox & Angelis, 2011). Administrators needs to support the students by providing them with quality teachers who will cultivate the appropriate connections with their students who are considered to be at-risk of dropping out of high school so as to encourage and support them in their persistence in obtaining their high school diploma (Brown & Rodriguez, 2009; Fredericks, Blumenfeld, & Paris, 2004; Lan & Lanthier, 2003).

**Implications for teachers.** Teachers who are tasked with working with students who are considered to be at-risk of dropping out of high school need to understand their impact on the student’s ability to achieve in Algebra I. These teachers need to have high expectations for this population of student and communicate these expectations with the students (Creasey, Jarvis & Knapcik, 2009; Furrer & Skinner, 2003; Lee & Brukam, 2003; Pinata & Stuhlman, 2004; Rosenfeld & Rosenfeld, 2008). The teachers need to
understand these students are historically disengaged by the time they reach the ninth grade and need to provide high academic expectations in a caring, safe learning environment (Brown & Rodriguez, 2009; Croninger & Lee, 2001; Klem & Connell, 2004). Teachers of students considered to be at-risk must understand their individual impact on the student’s ability to complete high school and work towards supporting, encouraging and helping them feel connected, especially in the Algebra I classroom.

**Recommendations for Future Research**

The ultimate goal of this research was to determine if a relationship exists between the perceived student/teacher relationship and the student’s performance on the state mandated standardized test as well as the student’s attendance in Algebra I. This study evaluated students considered to be at-risk of dropping out of high school in a large school district in Southeast Texas and found there to be a small, positive relationship between the students’ perceived student/teacher connectedness and the students’ performance on the STAAR Algebra I End of Course test. If this study was replicated with a larger number of students considered to be at-risk of dropping out of high school in different parts of the state of Texas, it would give information about whether or not the results of this study were able to be generalized to all students considered to be at-risk of dropping out of high school in the state of Texas. It would also be beneficial to complete a similar study looking at the impact of perceived relationships from the teacher’s perspective to see if the students and teachers are in alignment with their individual perspectives on their relationship.

Based on the results of this study, there is some significance to the students perceived student/teacher connectedness. A qualitative study investigating the
characteristics of a student/teacher relationship that has a high perception of connectedness would provide the qualities teachers should work on instilling in their classroom in order to provide support to students who are considered to be at-risk of dropping out of high school. With the growing number of at-risk students, it will be more important in the years to come to determine what instructional supports are necessary to keep students engaged in their education and ultimately graduate high school.

**Concluding Remarks**

This study has examined the impact of perceived relationships on the academic performance of students considered to be at-risk of dropping out of high school. However, many questions regarding the educational structures and supports necessary to help students considered to be at-risk of dropping out of high school persist through the completion of their high school diploma remain unanswered. There is still much research to be done and it is the hope of the researcher that finding answers to these many questions remains at the forefront of educational research for many years to come.
References


# Appendices

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Appendix A

Parental Consent

Dear _____________________,

I am currently a doctoral candidate at Lamar University conducting a study in order to complete my dissertation which examines the impact of perceived student teacher relationships. The purpose of this study is to investigate if a relationship exists between a student’s perceived relationship with his Algebra I teacher and the student’s academic performance in Algebra I. The results should be of interest and value to teachers and administrators in helping to determine the indicators for academic success in the Algebra I classroom.

Your student’s participation in this study is voluntary which means you do not have to allow your student to participate unless you choose to participate. If you choose to allow your student to participate, your student will be asked to complete a survey about his/her perceived relationship with his/her Algebra I teacher from the 2011 – 2012 school year. This survey should take approximately 20 minutes for your student to complete and your student will be pulled from his/her second period class during the first week of October.

All the information received from your student, including his/her name and any other identifying information will be kept confidential. Your student will be given a number to put on his/her survey which will allow for me to be the only individual able to identify your student’s information. When entering the information for data analysis no identifying information will be used and after data has been input, all identifying information will be discarded. Your student’s information will not be used in any way in the written report or presentation of this study.

If you allow your student to participate in this study, there are no expected risks or benefits to your student. This study has been approved by the Lamar University Institutional Review Board. You may determine whether or not your student is allowed to participate in this study and your student may withdraw from this study at anytime. If you choose to allow your student to participate in this study, please return the enclosed consent to participate form using the provided envelope before September 21, 2012. Please let me know if you have any questions or need additional information.

Sincerely,

Ashley Causey, Assistant Principal
Alvin High School
acausey@alvinisd.net
281-245-2751

Dr. Sandy Harris, Dissertation Chair
Lamar University
sandra.harris@lamar.edu
409-880-8676
SUBJECT CONSENT TO PARTICIPATION IN RESEARCH

Title of Study: The Impact of Perceived Relationships on At-risk Students’ Academic Achievement in Algebra
Name of Investigator: Ashley Causey
Phone Number: 281-245-2751

I understand that I am agreeing to allow my student to participate in a research study for the purpose of helping to determine the impact of perceived relationships on at-risk students’ academic achievement in Algebra. I understand my student will be asked to complete a survey which will take approximately 20 minutes. My student’s name will not be used and the confidentiality of his/her responses will be protected.

Risks
Participation in the study is entirely voluntary and does not entail any foreseeable risks. I understand my student may withdraw from the study at any time. All data will be maintained in a locked file in the investigator’s office for one year and then will be shredded. Consent forms will be forwarded to the Office of Research and Grants, John Gray Center, Building C, Box 11019, Lamar University.

Benefits
Benefits of participation may include a contribution to the scholarly research that determines the impact of relationships on an at-risk student’s academic achievement in Algebra. There are no foreseeable benefits for your student to participate in the study.

Participation
I understand that allowing my student to participate in this study is voluntary and I may withdraw my student from the study at any time. My refusal to participate will involve no penalty or loss of benefits to which I am otherwise entitled. I understand that my student will not be compensated for his/her participation. An offer has been made to answer all of my questions and concerns about the study. I will be given a copy of the dated and signed consent form to keep.

Student Name:_____________________________________

Parent/Guardian Signature________________________________ Date____________

Investigator____________________________________________ Date____________

If you have any questions about the research or your rights as a subject, please the Institutional Review Board, 409-880-7673.
Appendix B

Student Teacher-Relationship Scale

The following statements concern how you feel about your relationship with your Algebra I teacher. Respond to each statement by indicating how much you agree or disagree with it. Fill in the corresponding number on the Optical scan form using the following rating scale:

1 2 3 4 5 6 7

Disagree Neutral/ Agree
Strongly Mixed Strongly

1. I wish this teacher were more concerned with the welfare of students.
2. I find it difficult to allow myself to depend on this teacher.
3. The teacher is concerned with the needs of his or her students.
4. I’m afraid that I will lose this teacher’s respect.
5. I worry a lot about my interactions with this teacher.
6. It’s not difficult for me to feel connected to this teacher.
7. This teacher makes me doubt myself.
8. I am nervous around this teacher.
9. I find that the teacher does not connect well with students.
10. The teacher seems to only appreciate certain students.
11. I feel comfortable sharing my thoughts with this teacher.
12. I find it relatively easy to get close to this teacher.
13. Sometimes this teacher’s mood is unpredictable.
14. This teacher shows favoritism to some students.
15. This teacher seems uncomfortable interacting with students.
16. I prefer not to show this teacher how I truly think or feel.
17. It’s easy for me to connect with this teacher.
18. I get uncomfortable when teachers try to get too friendly with students.
19. I rarely worry about losing this teacher’s respect.
20. It makes me mad that this teacher does not seem to pay attention to the needs of his or her students.
21. I am very comfortable feeling connected to a class or teacher.
22. I’m scared to show my thoughts around this teacher; I think he or she will think less of me.
23. I usually discuss my problems and concerns with this teacher.
24. I don’t feel comfortable opening up to this teacher.
25. I’m afraid that if I shared my thoughts with this teacher that he or she would not think very highly of me.
26. I do not often worry about losing the respect of this teacher.
27. I find it easy to depend on this teacher for help.
28. If I were to get into trouble in this class, I do not think this teacher would be very motivated to help me.
29. I could tell this teacher just about anything.
30. I feel comfortable depending on this teacher.
31. I worry that I won’t measure up to this teacher’s standards.
32. I worry that this teacher does not really care for his or her students.
33. I prefer not to get too close to teachers.
34. I often worry that my teacher doesn’t really like me.

35. If I had a problem in this class, I know I could talk to the teacher.

36. I know this teacher could make me feel better if I had a problem.

**Scoring:**

**Teacher Connectedness Items:** Add items 3, 6, 11, 12, 17, 21, 23, 29, 30, 35, and 36.
Higher scores denote stronger feelings of connectedness, and low scores on this scale communicate avoidance or a tendency to eschew a close relationship with the teacher.

**Teacher Anxiety Items:** Add items 4, 5, 7, 8, 22, 25, 31, and 34.
Higher scores reflect a generalized anxiety regarding a relationship with the teacher, Whereas, lower scores reflect less threatening perceptions of this affiliation.
Appendix C

Permission to Use Survey

On Feb 4, 2012, at 9:24 PM, Ashley Causey <acausey@alvinisd.net> wrote:

I am a doctoral student at Lamar University in Beaumont, Texas and am about to start work on my dissertation. I am in the very beginning stages of writing my proposal but what I would like to study if there is a significant difference between the academic performance of students who perceive to have a positive relationship with their math teacher and those who do not perceive to have a positive relationship with their math teacher. I'd also like to see if there is a correlation between the students perceived relationship and their academic performance.

I have read your article in the *International Journal for the Scholarship of Teaching and Learning* (http://www.georgiasouthern.edu/ijsotl, Vol. 3, No. 2 (July 2009), ISSN 1931-4744 @ Georgia Southern University) and was wondering if it would be possible for me to use your Student Instructor Relationship Scale to measure the student's relationship with their teachers? If so, what do I need to do in order to be able to use this scale?

If you have any questions or need any additional information, please let me know.

Thanks!
Ashley Causey

Subject: Re: Student Instructor Relationship Scale
From: pajarvis@ilstu.edu
Date: Sat, 4 Feb 2012 21:44:00 -0600
To: acausey@alvinisd.net

Yes you may use it but please cite our paper.
Sent from my iPhone

On Apr 13, 2012, at 3:17 PM, Ashley Causey <acausey@alvinisd.net> wrote:

I just met with my dissertation committee and worked on my proposal. My committee members would like for me to change the word "instructor" to "teacher" since I will be using this scale with 9th grade students, they were concerned about the language being fully understood. I wanted to check with you all and see if it would be acceptable for me
to make this change?

Thank you so much for your help.
Ashley

Subject: Re: Student Instructor Relationship Scale
From: pajarvis@ilstu.edu
Date: Fri, 13 Apr 2012 15:23:29 -0500
To: acausey@alvinisd.net

That is fine and we would be interested in what you find! Thanks!
Sent from my iPhone

On Feb 4, 2012, at 9:24 PM, Ashley Causey wrote:

I am a doctoral student at Lamar University in Beaumont, Texas and am about to start work on my dissertation. I am in the very beginning stages of writing my proposal but what I would like to study if there is a significant difference between the academic performance of students who perceive to have a positive relationship with their math teacher and those who do not perceive to have a positive relationship with their math teacher. I'd also like to see if there is a correlation between the students perceived relationship and their academic performance.

I have read your article in the International Journal for the Scholarship of Teaching and Learning (http://www.georgiasouthern.edu/ijsotl, Vol. 3, No. 2 (July 2009), ISSN 1931-4744 @ Georgia Southern University) and was wondering if it would be possible for me to use your Student Instructor Relationship Scale to measure the student's relationship with their teachers? If so, what do I need to do in order to be able to use this scale?

If you have any questions or need any additional information, please let me know.

Thanks!
Ashley Causey

From: glcrease@ilstu.edu
Subject: Re: Student Instructor Relationship Scale
Date: Sun, 5 Feb 2012 10:42:35 -0600
To: acausey@alvinisd.net

Ashely, I believe the scale and instructions are included in the article. Best of luck with your research……
On Apr 13, 2012, at 3:17 PM, Ashley Causey wrote:

I just met with my dissertation committee and worked on my proposal. My committee members would like for me to change the word "instructor" to "teacher" since I will be using this scale with 9th grade students, they were concerned about the language being fully understood. I wanted to check with you all and see if it would be acceptable for me to make this change?

Thank you so much for your help.

Ashley

From: glcrease@ilstu.edu
Subject: Re: Student Instructor Relationship Scale
Date: Fri, 13 Apr 2012 16:28:24 -0500
To: acausey@alvinisd.net

Yes, that's fine with me......
Memorandum
Office of Research & Sponsored Programs
Lamar University

Date: September 10, 2012
To: Ashley Causey and Dr. Sandra Harris
From: Twila Baker, Director of Research Compliance
Re: Request for approval by IRB

Your project, “The Impact of Perceived Relationships on At-Risk Student’s Academic Achievement in Algebra” was reviewed and approved. It qualifies for approval because the research employs standard methods and procedures for testing and educational purposes, uses existing data, involves minimal risks to subjects, ensures anonymity and makes participation strictly voluntary in compliance with 45 Code of Federal Regulations (CFR) 46, also called the Common Rule. This approval is for a period ending one year from the date of this memorandum. Please make timely submission of renewal or prompt notification of project termination. Your IRB # is 7341310.

Remember to obtain approval from the Institutional Review Board before instituting any changes in the project. The Board wishes you every success in your research endeavor.
Appendix E

Protocol for Administering the Student Teacher Relationship Scale

Please follow all directions below as part of the procedure for distributing the Student Teacher Relationship Scale. Please read the script below to students once they have gathered in the large group instruction room.

“The survey I am about to distribute asks you to tell us about your relationship with your Algebra I teacher from the 2011-2012 school year. Information gathered from the Student Teacher Relationship Scale will be used to complete a study about the impact of perceived relationships on the academic success of students in Algebra I. It is very important that you answer each question truthfully.

I will be giving each of you a specific number to place at the top of your survey. Please do not write your name anywhere on the survey. By using a number, it will help keep your information confidential and only the researcher will be able to identify your information. [Give students individual numbers now and walk around to ensure all students have put their number on their survey.]

You will have all the time you need to complete your survey. When you have finished your survey, make sure you have answered every question to the best of your ability. Then raise your hand and I will come to your table and dismiss you.”

[Pass out the surveys and have students begin.]

[When a student finishes the survey, please check to make sure the student has answered each question and that the student has not put any identifying information on the survey (name, school identification number, etc.) – the ONLY identifying information that should be present is the students number given for this study. If a student has not answered every question, please say “You have not answered every question on the survey, please go back and answer the questions that you left blank.”]

[After a student has completely finished the survey and you have checked for completion and for the student’s number, students may be given a pass back to their class. Once all surveys have been completed, return all surveys to Ms. Causey.]
Biographical Note

Ashley Causey graduated from Alvin High School in Alvin, Texas in 2002. She then went on to East Texas Baptist University and received a Bachelor of Science in Education degree in Mathematics in May 2006. Causey attended the University of Houston-Clear Lake and earned her Master of Science degree in Educational Management in May 2010. She was accepted into the 2010 Doctoral Cohort at Lamar University where she earned her Doctor of Education in Educational Leadership degree in May 2013.

Causey began teaching at her alma mater, Alvin High School, in 2006 where she taught mathematics for three years before moving into the math instructional coach position at the same campus. After serving as the math instructional coach for two years, she moved into her current assignment as an assistant principal at Alvin High School.


Typist: Ashley Causey