Elementary Student Sense of Belonging: Achievement and Gender

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Abstract

The purpose of this research was to identify if there exists a relationship between student achievement and student sense of belonging, as well as gender influences on sense of belonging at the elementary level. This quantitative study utilized purposive sampling of students attending a suburban elementary school who completed a student survey implemented by the attending school district and the STAR Reading assessment during the winter testing window of the 2016-2017 school year. The sample included 691 third-grade students, 701 fourth- grade students, and 757 fifth-grade students. Chisquare tests of independence were conducted to determine the strength and direction of the relationship between the variables of student achievement and sense of belonging, and between the variables of gender and sense of belonging. The results were mixed for both sets of data analyses. For the relationship between student achievement and sense of belonging, a meaningful relationship was indicated for third-, fourth-, and fifth-grade students when sense of belonging survey questions were focused on the perceptions of respect among peers. For the relationship between gender and sense of belonging, a meaningful relationship was specifically identified with fourth-grade male students, indicating a more positive perception of peer respect than female students. For fifthgrade students there was a meaningful relationship identified for overall belonging and for teacher relationships specifically when asked about level of care and respect demonstrated by teachers. The mixed results from this study could indicate to school leaders and staff members that the strength of belonging to a learning community is changing for elementary students as they get older, based on the dynamic of the personal relationships between elementary students with their peers and adults. It is important for

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school staff to investigate and implement intentional strategies and structures that promote respect among all members of the school community to increase the potential for student sense of belonging to be consistent throughout their school career.

Dedication

This dissertation is dedicated to my family. School and getting a good education were always a priority in my family, from early elementary years through college. I see how the importance of education has influenced my passion for learning and doing the best I can to impact the learning environment throughout my childhood and professional career. I am thankful for the continuous support, love, and encouragement I received from my parents at every stage of the experience.

My brother, Donnie, influenced my focus on gender differences in this study. I thought of him often as I read the research and reflected on the results as we were motivated and felt belonging to school in such different ways. I try to channel him in my professional work as I engage with students that may not play school well, remembering how we all experience school in unique ways.

I am excited that my daughter, Abigail, has been a part of this dissertation writing journey. My hope is that she has witnessed the importance of persevering through challenges and moments of stress to accomplish goals. I want her to strive for her goals as she gets older and remembers this time when I worked hard to balance coursework and writing time with our life activities to reach my goal of completion.

This dissertation is evidence of my love for learning, the power of perseverance, and allowing my desire to accomplish my goals overcome perceived obstacles in my way. My family has been behind the scenes cheering me on, with Abigail the loudest of them all, excited to call me Dr. Mommy. There were moments where I wasn't sure it was going to come together, but with encouragement and a vision for success, it really happened!

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Chapter 1

Introduction

Educators are implementing rigorous standards identified for classrooms across states, continuing with the implementation of academic assessments, and balancing the development of student social-emotional needs in the learning setting. As educators increase collaboration regarding the intellectual development needs for each student, one area of importance that has quickly risen to the surface of the education world is relative to the increase in purposeful affective development of students.

One element of a student's affective development is student sense of belonging to the school community. A sense of belonging is a fundamental need for all human beings (Maslow, 1943, 1962) and has been reviewed over time as an influential factor in several facets of school success, including academic achievement (Goodenow, 1993; Goodenow & Grady, 1993; Solomon, Watson, Battistich, Schaps, & Delucchi, 1996). A strong sense of belonging to school can have a positive impact on commitment to academics, motivation to succeed, and engagement with school experiences (Goodenow, 1993; Osterman, 2000).

Student sense of belonging was defined by Sari (2012) as the "psychological membership in the school or classroom" (p. 1), which is the result of feeling accepted, included, respected, and valued within the learning community (Goodenow, 1993; Goodenow & Grady, 1993). In a school's culture, building a sense of belonging to the learning community is a blend of students building connections with staff and other peers (Edwards & Mullis, 2001), becoming involved or engaged in meaningful academic-related activities (Chung-Do, Goebert, Chang, & Hamagani, 2015; McNeely & Falci,

2004), as well as expectations of and perceived success with academic tasks (Nichols, 2006). There are several variations included in the literature that are used synonymously with sense of belonging, such as belongingness (Nichols, 2006; Osterman, 2000), relatedness (Deci, Vallerand, Pelletier, & Ryan, 1991; Furrer & Skinner, 2003; Ryan & Powelson, 1991), school belonging (Goodenow, 1993; Shochet, Smith, Furlong, & Homel, 2011), and school connectedness (McNeely, Nonnemaker, & Blum, 2002).

While the terminology and definitions may be slightly different, there is a common determination that "students' experience of acceptance is associated with a positive orientation toward school, classwork, and teachers" (Osterman, 2000, p. 331). The positive orientation created by a strong sense of belonging to the school community can be connected by multiple education-related outcomes which all, in turn, impact intellectual achievement. Battistich, Solomon, Kim, Watson, and Schaps (1995) established a significant relationship between sense of belonging and prosocial attitudes related to school. Increased prosocial attitudes along with positive relationships with peers and adults contribute to a stronger sense of belonging and therefore increase academic engagement and motivation to succeed (Goodenow, 1993; Osterman, 2000; Solomon et al., 2006; Tillery, Varjas, Roach, Kuperminc, & Meyers, 2013).

A recent study on student sense of belonging has identified statistically significant differences between females and males, with females showing a stronger sense of belonging to school than males (Sari, 2012). Gender differences have been documented to create variances in student sense of belonging due to variances in the development of relationships between adults and peers, between males and females over time (Furrer & Skinner, 2003; Goodenow, 1993; Uwah, McMahon, & Furlow, 2008). Although several

additional factors have been determined to impact student sense of belonging, gender is relevant to the current study due to connections that are developed by the youngest learners.

Background

Students included in this study were from a suburban school district in a major Midwestern metropolitan area. District XYZ is a public school district with twenty schools serving pre-kindergarten to 12th-grade students. Nine different communities and municipalities form District XYZ boundaries with an approximated population of 72,000 citizens (District XYZ, 2020). Students who participated in this study attended one of 10 elementary schools in District XYZ during the 2016-2017 school year. The elementary population of District XYZ totaled 5,147 students in kindergarten to 5th grade during the 2016-2017 school year. Student demographic information for District XYZ is presented in Table 1.

Table 1

Student Demographic	District	Elementary Students

Student Demographic Information for District XYZ and District XYZ Elementary Students

Student Demographic	District	Elementary Students
Student Enrollment	11,287	5,147
Diverse Populations	30.5%	31.1%
Free and Reduced Lunch	27.9%	30.4%
Mobility	10.2%	12.5%

Note. Adapted from Demographic profile 2016-2017, by District XYZ, 2017. Copy in possession of the author.

Statement of the Problem

Schools make it a priority to maximize academic achievement and growth for students throughout the education system but need also to make it a priority to keep all students connected with the learning process in a meaningful manner. The school and classroom climate has a large influence on students' emotional investment with the school community and impacts on academic achievement (Goodenow, 1993; Goodenow & Grady, 1993; Osterman, 2000; Sari, 2012). Students need a learning environment in which they feel valued and accepted to stay invested in the learning process (Arslan, 2019; Karcher & Lee, 2002; Osterman, 2000). The structures designed by school personnel to promote involvement do not always support the specific learning and emotional differences noticed among female and male learners within the school population (Allen, Kern, Velia-Brodrick, Hattie & Waters, 2018; Niehaus et al. 2012).

A student's sense of belonging to school and the learning process has a positive impact on the academic progress for students (Furrer & Skinner, 2003; Goodenow, 1993; Sari, 2012). School administrators and teaching faculty need to understand better the factors that influence student sense of belonging to design programs and processes that effectively create a learning environment that meets the psychological needs of elementary students. School personnel would benefit from developing a deeper understanding of how student sense of belonging and connection to school at the elementary level is developed to support program design within the learning setting to maximize intellectual experiences for all learners, no matter their age or background.

Purpose of the Study

Two purpose areas existed with the current study. The primary purpose of this study was to analyze the relationship between students' perceptions of school belonging and academic achievement for third-, fourth-, and fifth-grade students. The second purpose of the study was to identify differences in third-, fourth-, and fifth-grade students' perceptions of school belonging between female and male students.

Significance of the Study

Most of the research regarding student sense of belonging has demonstrated the extent of and impact of sense of belonging on middle school, high school, and college-aged students. Results from this quantitative study contribute to the body of knowledge by analyzing elementary student perception of belonging on academic achievement and influenced by gender. Analysis of survey data, in conjunction with academic achievement data review, could guide administrators, counselors, and teaching staff to a more in-depth understanding of factors that influence student sense of belonging and achievement for elementary students. By analyzing differences in the sense of belonging between females and males, the results of this study can aid practitioners with knowledge concerning the need to differentiate approaches for developing a sense of belonging for both females and males at the elementary level.

Delimitations

The following delimitations were designed for this study:

 The sample consisted of Grades 3 through 5 elementary students within one district in the state of Missouri; generalization to other schools in the state of Missouri may not be feasible.

- 2. Advance Questionnaire data from the 2016-2017 survey window were used; generalization to other school year results may not be feasible.
- 3. This study was focused on using STAR Reading from grades 3, 4, and 5; generalization to other grade levels may not be feasible.

Assumptions

The research was conducted under the following assumptions:

- 1. The STAR Reading data retrieved from Renaissance Learning were reliable, valid, complete, and accurate.
- 2. Teachers who administered the STAR Reading assessment to students followed the administration protocol.
- The Advance Questionnaire (AQ) data collected from District XYZ Elementary School were accurate.
- 4. Teachers who administered the AQ followed administration protocol.
- 5. The respondents completed the survey with accuracy and honesty, understanding each of the questions presented.

Research Questions

This study used a correlational research design, and therefore, the following research questions were identified to support the quantitative component of the study:

RQ1. To what extent is there a relationship between student achievement, as measured by STAR Reading levels, and elementary students' perceived sense of belonging?

RQ2. To what extent is there a difference in students' perceived sense of belonging between female and male elementary students?

Definition of Terms

The following terms are defined to provide background knowledge for this study.

Advance Questionnaire (AQ). The Missouri Advance Questionnaire is a series of surveys administered to staff, students, and parents to evaluate school and district processes. AQ data is utilized by the state of Missouri as part of a district's Missouri School Improvement Plan (MSIP) Accreditation reports (Department of Elementary and Secondary Education [DESE], 2014).

Scaled Score (SS). For the STAR Reading assessment, scaled scores range from 0 to 1400. The scaled score is determined based on the difficulty of assessment questions posed and the number of correct responses given by a student. The scaled score serves as the norm-referenced score for the STAR Reading assessment (Renaissance Learning, 2014).

Sense of Belonging. Student sense of belonging is defined as the "psychological membership in the school or classroom," (Sari, 2012, p. 1), which is the result of feeling accepted, included, respected, and valued within the learning community (Goodenow, 1993; Goodenow & Grady, 1993). The author of this study decided to use the term sense of belonging, but recognized that other terminology is utilized in research to convey similar definitions. Such terminology includes belongingness, relatedness, school belonging, and school connectedness.

Organization of the Study

Chapter 1 provides the overview of the study, including the statement of the problem, purpose of the study, significance, research questions and method used for the study. Chapter 2 synthesizes research regarding student sense of belonging, the

relationship with academic achievement, and differences in sense of belonging between females and males. Chapter 3 identifies the research methodology utilized in this study. Chapter 4 provides the results of the study regarding the research questions identified for the study. Chapter 5 summarizes the totality of the current study, presents the summary of the findings, conclusions made based on the findings, implications for further actions, and recommendations for future study.

Chapter 2

Review of the Literature

The need to belong is a natural human response, rooted in psychological research dating back to the mid-twentieth century (Maslow, 1943, 1954, 1967). For students amid the learning process, "the psychological sense that one belongs in a classroom and school community is considered a necessary antecedent to the successful learning experience" (Beck & Malley, 1998, p. 133). For this research, the term sense of belonging will be used throughout the paper to refer to the general feeling of connectedness to others in the school environment, and individual belief of importance within the community of learners (Strayhorn, 2012). Maslow's research is the foundation for understanding human behavior for educational and non-educational purposes of meeting the needs of a larger group of people, whether they are young students in school, young adults seeking higher education, or individuals in faith-based organizations trying to seek a larger purpose for life.

The purpose of this chapter is to synthesize the literature surrounding student sense of belonging and related research with achievement in schools. This chapter will be organized into three sections. The first section of this chapter includes a review of the research regarding belonging and the related terminology, with an in-depth focus on theoretical perspectives. The second section contains an explanation of factors that influence sense of belonging and student connectedness to school. The last section includes research directly related to sense of belonging and gender, which is the focus of this study.

Defining Sense of Belonging

A student's sense of belonging can be clearly defined as a "student's feeling of being personally accepted, respected, included, and supported by others in the school" (Sari, 2012, p. 1). The feeling of acceptance and inclusion in the school environment can lead to higher motivation, engagement, achievement, and commitment to maximize learning (Booker, 2004; Goodenow, 1993; Goodenow & Grady, 1993; Osterman, 2000). Sense of belonging conveys both "affective and cognitive components in considering connections with school," (McMahon, Parnes, Keys, & Viola, 2008, p. 389), which will be used in the documentation moving forward. Researchers in this field of study use a variety of terms to describe sense of belonging. While the variations may seem slight, the nuances and meaning behind each term, strategically developed, creates a breadth of information for educators to consider when developing programming for students to maximize learning.

The term, school belonging, is used widely in the literature (Anderman, 2002; Baumeister & Leary, 1995; Goodenow, 1993b; Ryan, 1995) to refer to a "psychological membership in the school or classroom, that is, the extent to which students feel personally accepted, respected, included, and supported by others in the school environment" (Goodenow, 1993b, p. 80). An important distinction in this definition is the focus on the psychological implication in feeling a connection to the school organization and people involved in the community.

Different terminology is used in the research to describe the nature of students' feeling of a true connection to a school community. Synonymous terms found in the literature to describe the essence of the construct of belonging and the impact on

education include belongingness (Nichols, 2006, 2008; Osterman, 2000), relatedness (Deci, Vallerand, Pelletier, 1991; Furrer & Skinner, 2006; Ryan & Powelson, 1991), and school connectedness (Barber & Schluterman, 2008; McNeeley, Nonnemaker & Blum, 2002; McNeeley & Falci, 2004). Identifying the varying perspectives from the research allows educators to understand the complex construct of how the connection to the institution of school can contribute to desired academic outcomes (Anderman & Freeman, 2004), as well as what aspects of the school structure and environment impact the development of school belonging.

Theoretical Perspectives Regarding Sense of Belonging

Several theoretical perspectives exist in literature to support understanding of school sense of belonging and the important connection to academic growth and development. The following will review both historical and modern theoretical models related to school sense of belonging and related constructs of development that impact psychological development, overall health and well-being, and academic achievement.

The psychological perspective of sense of belonging has a foundation in work documented by Abraham H. Maslow (1943; 1954; 1962). Maslow (1943) developed a hierarchy of needs that must be satisfied for humans to be motivated to grow and develop effectively in life. Humans are intrinsically motivated to reach self-fulfillment in life when the basic needs for safety, belongingness, love, and self-esteem are gratified and met in a dynamic process throughout life (Maslow, 1962). Developing a sense of belonging is essential to building a strong sense of self at various stages of life, including life in a school setting. A sense of belonging and connectedness to essential people in one's life is foundational to Bowlby's Attachment Theory (1969). It is concluded that developing quality relationships at young ages is critical to a child's development and can have a positive impact on future relationships and success in life. Furrer and Skinner (2003) identified that children with secure attachments during their developmental milestones function well "in a variety of life domains, including peer relations, school performance, and the establishment of healthy relationships with nonfamilial adults" (p. 148). The foundation of attachment theory is essential to consider when reviewing the influences of a sense of belonging in the institution of school.

"The study of school belonging, particularly in relation to motivation, is one part of a larger body of research on the role of social relations and interactions in students' motivation" (Anderman & Freeman, 2004, p. 27). Deci and Ryan (1985, 1991) expand on the concept of motivation and the impact on education with the development of a Self-Determination Theory. This theoretical perspective identifies that academic outcomes of "interest in learning, a valuing of education, and a confidence in their own capacities and attributes...are manifestations of being intrinsically motivated and internalizing values and regulatory processes" (Deci et al, 1991, p. 325). When basic human needs of competence, relatedness, and autonomy are met in a social context, then an individual's motivation, performance, and development of higher-level skills in life will be maximized (Deci & Ryan, 1991).

Research conducted by Carol Goodenow (1993; Goodenow & Grady, 1993) has had a strong influence on the study of sense of belonging, identifying a focus on the relatedness between an individual's perception of school membership and motivation to succeed in a school setting. Goodenow (1993) initially identified a positive relationship between expectations of success, teacher support, class belonging, and student motivation, related to academic achievement. This research was extended with the creation of an 18-item Psychological Sense of School Membership scale (PSSM) concluding that school belonging can be associated with academic motivation, due to a sense of value, across multiple student groups (Goodenow & Grady, 1993).

Measurement of Sense of Belonging

There are multiple approaches for measuring a sense of belonging in the research. Carol Goodenow (1993) was one of the first researchers in this field to examine student membership in a school setting with survey data. The PSSM was developed and implemented with middle school students to quantify sense of belonging and expectancy of academic success. The PSSM was designed to measure "the extent to which students feel personally accepted, respected, included and supported by others in the school" (Goodenow, 1993, p. 80). The multidimensional nature of the PSSM is used to evaluate perceptions of three factors connected with school belonging. The three factors include caring relations, which measures the perceived value of adult relationships; acceptance, which measures whether a student feels a level of acceptance or belonging within the school structure; and rejection, to measure perception of disrespect from all people within the school community. This tool has been utilized in several studies (Nichols, 2008; Osterman, 2000; Shochet, et al., 2011) to support the understanding of influences on and factors driven by a school sense of belonging.

Additional studies have been completed to clarify how the PSSM supports various definitions of belonging as well as evaluating the questions used in the tool (Cheung,

2004; Hagborg, 1994; O'Farrell & Morrison, 2003; You, Ritchey, Furlong, Schochet & Boman, 2011). Suggestions exist for narrowing down questions to target the dimensions of belonging and to resolve inconsistencies found among studies using the tool (O'Farrell & Morrison, 2003; You et al., 2011). Whiting, Everson & Feinauer, (2018) created a Simple School Belonging Scale (SSBS) with an intent to develop a scale to measure belonging in the school setting that focuses on key factors related to the development of belonging. The SSBS utilized five questions from the PSSM and added five new items developed to better understand the foundation of sense of belonging. The SSBS survey questions centered on three elements of belonging: overall feeling of acceptance and being liked by others, relational aspects of fitting in with peers, and connection with teachers. Results indicate the "SSBS is psychometrically sound with preliminary evidence of construct validity" (Whiting et al., 2018, p. 176).

Another measurement tool recently introduced to the school belonging field of study is the School Belongingness Scale (SBS) developed by Arslan and Duru (2017). The SBS was designed as a 10-item screening tool to help identify key areas of social exclusion and social inclusion with elementary school students in Turkey. The questions included in SBS were designed to identify perceived levels of connecting with peers and teachers, recognition of acceptance, and involvement in the school community. Early implementation of the tool in studies indicated a good data fit with scales that support other tools measuring belongingness perceptions (Arlsan, 2019).

Just as there are varying approaches to the view of school belongingness, there are varying tools that are used to measure sense of belonging as a field of study. While on the surface the concept of school belonging may come across as simple, its multiple dimensions of behavior, psychology, and academia can be challenging to assess and to make decisions as an education profession. The tools used to measure sense of belonging identify different experiences in a student's school career that create the feeling of belonging and connection to the school environment.

The Benefits of School Belonging

Sense of belonging is a natural psychological function of human beings, and the continued development of a strong sense of belonging in school is "protective for students and supports the psychosocial and academic well-being of students" (Whiting et al., 2018, p. 176). Having a sense of belonging to the school influences pro-social and emotional needs as well as is associated with quality decision making in the context of the school (Allen & Kern, 2017; Anderman & Freeman, 2004; Centers for Disease Control [CDC], 2009; Resnick et al., 1997). According to the CDC (2009), schools can have a great impact on the health of students when promoting a sense of belonging. A strong sense of belonging to the school setting can influence both the health and wellbeing of students in both the emotional and physical realms.

"School belonging is a significant predictor of various important school-based and quality-of-life outcomes in youths" (Arslan, 2019, p. 22). When students feel a connection to the school environment and the people with whom they interact with daily, there is higher motivation to attend school regularly (CDC, 2009; Croninger & Lee, 2001; Louis, Smylie, & Murphy, 2016; Nichols, 2008) and lower occurrence of dropping out of school (Fine, 1991; Kagan, 1990). A positive sense of belonging has been associated with increasing the mental health of children and supporting positive transitions during an academic life (Baumeister, 2012). Riley (2017) identified a relationship between increased sense of belonging and student reported increased sense of agency and confidence with school expectations. More specifically, there is evidence showing decreased feelings of anxiety, depression, social rejection, suicidal ideations, and behavioral problems (Anderman, 2002; Anderman & Freeman, 2004; Baumeister & Leary, 1995; Baumeister, 2012; CDC, 2009; Louis et al., 2016; McNeely & Falci, 2004; Moody & Bearman, 2004).

A positive sense of belonging is not only associated with positive influences on emotional wellness, but also connected to a decrease in potentially dangerous physical choices. The CDC (2009) identified that a positive sense of belonging is connected to adolescents being less likely to smoke cigarettes, drink alcohol, or seek connection with peers through sexual relationships. Resnick et al. (1997) also identify how a positive sense of school belonging is related to a decrease in substance abuse and lower involvement in violence. A sense of belonging can be multi-dimensional and doesn't always prevent the initiation of risk-taking behavior but can have a long-term impact on whether the behaviors progress and continue or diminish over time (McNeely & Falci, 2004; McNeely et al., 2002).

Factors That Influence Sense of Belonging

The general feeling of connection to school is developed over time and builds upon experiences with adults and peers, creating a sense of acceptance. "For many students, this connection was experienced through the opportunities given to them by the school" (Gowing & Jackson, 2016, p. 64). All factors that influence belonging create a general commitment to school in a way that influences academic achievement. Allen and Kern (2017) identified in their meta-analysis that, while there are some factors that have a higher influence on the development of sense of belonging, multiple combinations of both internal qualities of the young person and the external environment create the experience in the school community. School belonging can be correlated to the development of strong relationships with others, possessing a pleasant attitude and commitment about being a part of the school community, and an overall feeling of liking the school environment and culture (Barber & Schluterman, 2008; Blum & Libbey, 2004; Brown & Evans, 2002; CDC, 2009; Libbey, 2004).

In a meta-analysis study conducted by Allen et al. (2018), it was identified that the leading contributor to positive school belonging is teacher support. Strong teacherstudent relationships have a powerful influence on sense of belonging as students feel that the adults in their community care about them as people, and desire for success with learning (Allen et al., 2018; Blum & Libbey, 2004; Hattie, 2009; McNeely & Falci, 2004; Osterman, 2000; Riley, 2019). "Supportive teachers expect students to do their best, and scaffold learning to help the student achieve" (Allen et al., 2018, p. 5). When strong relationships occur in the school setting with the adults, there exists an emotional foundation creating connection, safety, and acceptance to enjoy school (Allen et al., 2018; Anderman, 2003; Blum & Libbey, 2004).

The other element of relationship building within a school community includes peer support. A mixed-methods study of high school students by Gowing and Jackson (2016) concluded that peer relationships have a stronger relationship to school connection due to the endurance and influence over time by peers in the school setting. The concept of peer support refers to the dynamic of trust, relatability, and reliability of friends and peers with comparable qualities and interests (Allen & Kern, 2017; Hamm & Faircloth, 2005; Wang & Eccles, 2012). Supportive peers provide social acceptance, can provide academic encouragement, and an overall feeling of being understood, which increases the feeling of belonging in the community (Hamm & Faircloth, 2005; Ma, 2003; Riley, 2019). While peer support has a strong influence on sense of belonging, according to a meta-analysis study conducted by Allen et al. (2018), peer support was not as high an influence as teacher support in the learning community. In the end, all positive relationships increase a sense of belonging to fuel a foundational need to be deeply known, accepted, and befriended for all personal qualities offered to the community (Riley, 2019).

Based on the meta-analysis by Allen et al. (2018), one of the top contributors to the development of sense of belonging is possessing positive personal characteristics and dispositions for school. The study identified moderate to high correlations existing between positive personal characteristics and the development of social relationships. There exists an increased focus on the development of positive personal and academic skills in the school setting to potentially build student psychological stamina and perseverance with difficult academic experiences (Friedman & Kern, 2014; White & Waters, 2015)

The construct of sense of school belonging is about perception of the environment and a personal qualitative evaluation of the community connection within the school context. "School climate that makes students feel that they are cared for, safe, and treated fairly is conducive to their developing a positive sense of belonging to school" (Ma, 2003, p. 348). All psychological, social, and physical factors together build on the perception of liking the community and increase a student's willingness to contribute to the success of the system, which in turn contributes to the academic elements of the school dynamic. Resnick et al. (1997) described three key elements necessary to maximize and elevate the feeling of belonging, which requires attachment, commitment, and involvement. It is hypothesized that when a student has all three key elements present, sense of belonging has a greater influence on academic success in their school environment.

Sense of Belonging and School Implications

"A sense of school belonging is an important factor that contributes to students" academic success" (Allen et al., 2018, p. 20). Multiple studies identify a strong correlation between a strong sense of belonging and an increase in academic achievement and attainment of knowledge (Arslan, 2019; Booker, 2004; Furrer & Skinner, 2003; Pittman & Richmond, 2007; Osterman, 2000; Sari, 2012). Sense of belonging in the school setting reflects how much students feel connected both affectively and behaviorally (Karcher & Lee, 2002; Libbey, 2004). Students continue to develop a sense of identity in the school setting based on how they feel they connect with others, as well as how they continue to engage with others based on common interests, activities, and groups with which they begin to associate (Karcher & Lee, 2002). This feeling of closeness with others in the school setting sets the stage for success as students display an increased commitment to the overall community. This commitment, in turn, leads to other academic behaviors that influence success with academic achievement. Academic behaviors impacting academic achievement include academic engagement, agency, motivation, and adjustment (Battistich et al., 1995; Booker, 2004; Goodenow, 1993; McNeely & Falci, 2004; Pittman & Richmond, 2007).

When investigating factors that have the strongest influence on academic performance, Sirin and Rogers-Sirin (2004) found that school engagement has the strongest relationship. When children feel a strong connection to the school population and environment, their commitment to schooling and academia is enhanced (Ma, 200).

Another academic area impacted by sense of belonging is the concept of student agency. It was identified in a review of studies by Riley (2019) that as students' sense of belonging to a school community grew or became more solidified, there was an increase in confidence and a sense of agency. Agency is connected to identity, confidence and competence felt within a group and how one can positively contribute to the school community. When a student feels a strong level of agency within an environment, there is higher motivation to participate and take action to maximize the experience within an organization (Richardson, 2015). Agency, as described by Markum and Aveyard (2003), empowers students in decision-making processes that contribute to the learning process, structures, content, and various elements of their school environment. Students then feel they have a voice that matters, with a realistic ability to make a positive impact on the learning environment for themselves and others in the school environment (Riley, 2017, 2019).

Sari (2012) identified that when students have a strong sense of value in and see themselves as a valuable part of a learning community, there exists a higher motivation to be academically successful. Academic motivation is described as the "extent to which students are motivated to learn and do well in school" (Libbey, 2004, p 278). Motivation in the school setting is based on the ability to think about goals and the realized ability to accomplish the goals, as well as actualized behaviors displayed to meet the defined goal (Anderman 2002; Goodenow & Grady, 1993; Ryan & Deci, 2000). Academic motivation is believed to be both a contributing factor and a byproduct of a student's sense of belonging to school, serving as reciprocal constructs (Allen & Kern, 2017). A study by Goodenow and Grady (1993) revealed that academic motivation has a stronger influence on the development of sense of belonging than peer connection or friendships. It was suggested in the study that motivation can serve as a mediating agent between the feeling of membership to the school environment and academic effort, leading to achievement.

In the end, academic behaviors lead to the improvement of learning recorded in a variety of quantitative methods, labeled as academic adjustment. The concept of academic adjustment can be found in work by Pittman and Richmond (2007), where it is identified that students with a higher sense of belonging have a higher investment in improving grades and desire for increased knowledge within their preferred group. "Students' individual levels of school belonging predicted higher GPA and greater general optimism" (Anderman & Freeman, 2004, p. 35). When students perceive a positive learning environment and share the focus and responsibility, they have a higher bonding to school and have higher grades (Catalano, Haggerty, Oesterle, Fleming & Hawkins, 2004; Davis, 2006).

Sense of Belonging and Gender

The focus of this study was narrowed to how sense of belonging is perceived and developed differently by boys and girls in the school setting. There are varying results from studies about gender and a sense of belonging in the school setting. Many studies have identified that female students have a stronger sense of belonging (Allen et al., 2018; Goodenow, 1992; Osterman, 2000; Sari, 2012), with one showing the opposite effect (Shochet, Smyth, & Homel, 2007), and others showing no difference between female and male students in the school setting (Read, Archer, & Leathwood, 2003; Sanchez, Colon & Esparaza, 2005).

In a study by Sari (2012) involving middle school-aged children, significant differences were found between gender and sense of belonging. Females were identified as having a higher sense of belonging across several sub-scales, with males feeling a stronger feeling of rejection at the time of the study. This is consistent with another longitudinal study by Niehaus et al. (2012) identifying middle school girls consistently possessing a higher sense of belonging over boys for multiple years, then the difference decreasing from year to year as students age further into their high school years. Additional studies also report females demonstrating higher connection and generally reporting a positive relationship with the school setting (Goodenow, 1993; Goodenow & Grady, 1993; Nichols, 2008; Sari, 2012). Results of a study conducted by Sayer, Beaven, Stringer, and Hermena (2013) with students in primary schools suggested that boys have a lower value of belongingness, possibly due to underachievement boys experience in school compared to their female peers, and less affinity to the school system. In a metaanalysis by Allen et al. (2018), identifying contributing factors to an increased sense of school belonging, it was stated that "gender was only weakly associated with school belonging, such that girls tended to feel a greater sense of belonging than boys" (p. 24). Age and year in school, attitude toward school, involvement in school, and view of relationships contribute to differences in the sense of school belonging based on gender.

There is a suggestion in some studies that gender differences may vary by age and year in school. In a longitudinal study by Ma (2003), there existed a gender difference with girls reporting a higher level of sense of belonging for three consistent years, but by the third year, the difference between girls and boys began to decrease. Gender differences are summarized in a study by Gillen-O'Neel and Fuligni (2013) that girls had a higher sense of belonging during earlier years in school with a decline later in their school experience, whereas boys' sense of belonging remained more consistent throughout their school experiences. Niehaus et al. (2012) identified that girls show a higher ability to transition between school settings and tend to have a higher sense of identity within the school environment. Female students have a stronger focus on peer relationships, report a greater level of positivity to the school experience, and become more involved in activities earlier in their school career than boys (Allen et al., 2018; Gentry, Gable, & Rizza, 2002; Goodenow, 1993; Riley, 2019; Sari, 2012).

Summary

The need to belong is fundamental to human development and has a foundational impact on the relationship of students to a school community and academic success (Ma, 2012; Osterman, 2000; Sari, 2012). A strong sense of belonging to a school environment has been identified as a fundamental protective factor for relationship building to peers and adults, child and adolescent health and physical development, and academic achievement (Nichols, 2008; Solomon et al., 1996). The feeling of support within a learning community generates the perception of belonging to the school, which in turn increases academic motivation, and engagement in learning opportunities present in the school setting (Goodenow & Grady, 1993; McNeely & Falci, 2004). A strong sense of

belonging to school can have a positive impact on commitment to academics, motivation to succeed, and engagement with school experiences (Goodenow, 1993; Osterman, 2000). Regarding gender differences, research identifies that girls have an overall higher sense of belonging than boys in the school setting (Goodenow, 1993; Niehaus et al., 2012; Nichols, 2008; Sari, 2012).
Chapter 3

Methods

The primary purpose of this study was to determine the relationships between student sense of belonging and the academic achievement of third-, fourth-, and fifthgrade students. The second purpose of this study was identifying differences in sense of belonging that may exist between female and male students in third, fourth, and fifth grade. This chapter includes an explanation of the methodology used to identify the relationships that potentially exist between the key variables. Included in this chapter are the following sections: research design, selection of participants, measurement data collection, data analysis and hypothesis testing, limitations of the study, and a summary of the chapter.

Research Design

The researcher chose a non-experimental quantitative design for this study. A quantitative design was chosen as the best method to determine a relationship between the variables identified. Student survey data regarding school sense of belonging was analyzed in comparison with achievement data of third-, fourth, and fifth-grade students to determine if a relationship exists between perception and achievement levels. The results of student survey data regarding school sense of belonging were also examined based on gender of the third-, fourth-, and fifth-grade students to determine if differences in perspective existed between female and male students.

Selection of Participants

The population for the study was third-, fourth-, and fifth-grade public school students attending school in a suburban setting. The sample for the quantitative study involved third-, fourth-, and fifth-grade students attending 10 elementary schools in a Midwest suburban school. The sample represented all the student population attending the identified elementary schools in the specified grade levels during the 2016-2017 school year. The criteria for inclusion in the study was completing the student survey and participating in the winter window for the STAR Reading assessment for District XYZ. Any student who did not have a completed survey or assessment in the winter installation of the district assessment was not included in the analysis for this study.

Measurement

Student perception data regarding sense of belonging came from the student survey implemented by District XYZ (2016). This survey instrument contained 39 questions regarding factors associated with a student's educational experience. Questions on the survey represented a combination of items from the student Advanced Questionnaire (AQ) developed by Missouri School Improvement Program (MSIP) and student survey items developed by Panorama Education. The survey is presented to students in grades three through twelve attending District XYZ using an online format; students complete the survey and then results are tabulated instantaneously.

Student Survey. Questions from the student survey directly related to student relationships with the school and sense of school belonging were strategically pulled for analysis of each of the variables necessary for this study. The specific questions utilized

for the analysis in the current study are identified in Table 2. The complete survey

content is included in Appendix A.

Table 2

Student Survey Questions F	Pertaining to S	Sense of Bel	longing
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Item	Survey Question	Likert Responses
#14	Teachers in my school really care about me.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
#15	Teachers treat me with respect.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
#20	There is a feeling of belonging at my school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
#21	Students in this school respect differences in other students.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
#34	Overall, how much do you feel you belong at your school?	Do Not Belong, Belong a Little Bit, Belong Somewhat, Belong Quite a Bit, Completely Belong
#35	How much respect do students at your school show you?	No Respect at All, A Little Bit of Respect, Some Respect, Quite a Bit of Respect, A Great Deal of Respect

Note. Adapted from *fall student survey*, District XYZ, 2016. Copy in possession of the author.

The AQ was designed for use by the Missouri Department of Elementary and Secondary Education (DESE) in the 1980s to support the first Missouri School Improvement Plan (MSIP) reviews (Jamtgaard, 2012). According to DESE (2015), the Advance Questionnaire (AQ) was developed to support Missouri School Improvement processes with results included in district accreditation reports. The purpose of the AQ was to provide districts with feedback regarding several educational processes that impact the learning environment. AQ results were utilized by districts to identify improvement needs in order to maximize the learning opportunities for students. The AQ items used across the state at the time of the study are in the fourth revision with questions reflecting research regarding quality school improvement processes (Jamtgaard, 2012). The full instrument contains questions developed to gather feedback regarding nine scales or constructs regarding education processes that have a strong relationship to academic growth (Preis, 2009). Feedback is provided by key stakeholders (students, parents, and school personnel) essential to the learning system (DESE, 2015). A summary of the AQ scales and the stakeholder group completing the survey items associated with the items that measure each construct is available in Appendix B.

Items developed from Panorama Education (Gehlbach, 2015) were also included in the instrument provided by District XYZ. Panorama Education is a company located in Boston, MA that is dedicated to supporting quality education practices through the development and analysis of student survey feedback (Panorama Education, 2015a). Panorama Education created a student survey designed to measure student perceptions regarding 10 key features of teaching effectiveness (Gehlbach, 2015). Included in Appendix C are the survey's 10 scales developed by Panorama Education. District XYZ decided to include items from the Sense of Belong scale with items from the AQ for the Student Survey. The content for the survey tool was designed to gauge various needs of teachers, schools, and districts based on the 10 scales as identified previously. The survey can be utilized as a whole or by independent scales, depending on the needs of the organizations or individuals utilizing the instrument (Panorama Education, 2015b). *Measurement*. For this research, student perceptions regarding school climate, especially sense of belonging, were generated from the student survey implemented by District XYZ (2016). Participants responded to individual items by identifying their level of agreement on a Likert-type scale. Each of the Likert-type responses was given a numerical value of one to five to correspond with level of agreement based on specific survey item descriptions. Table 3 summarizes the numerical value provided based on Likert-type item descriptions for each of the survey questions used in this study.

Table 3

Survey	Numerical value identified for each Likert-type response						
Number	1	2	3	4	5		
# 14, 15, 20, and 21	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
#34	Do Not Belong	Belong a Little Bit	Belong Somewhat	Belong Quite a Bit	Completely Belong		
#35	No Respect At All	A Little Bit of Respect	Some Respect	Quite a Bit of Respect	A Great Deal of Respect		

Numerical Values for Likert-type responses on Fall Student Survey

Note. Adapted from f*all student survey*, by District XYZ, 2016. Copy in possession of the author.

AQ student survey items. The validity of the AQ was determined by an internal review of content validity and convergent validity (Jamtgaard, 2012). One report identified that content validity was determined by consulting a panel of essential stakeholders involved in education decision making from the state of Missouri to support discussions regarding creation, implementation, and review of the instrument and results (Jamtgaard, 2012). The other type of validity was determined by obtaining feedback

through surveys from multiple sources such as teachers, students, and parents (Jamtgaard, 2012).

Reliability was determined for the AQ by generating Cronbach's alpha values for each of the scales. Cronbach's alpha is also known as coefficient alpha and estimates internal consistency. The statistical approach is used "to base reliability on the score for each item compared with the score for all of the other items on the test" (Tanner, 2012, p. 398) and estimates internal consistency.

Panorama Education survey items. The student survey contained 15 questions, which originated from student survey items created by Panorama Education. The company is continuously involved in validity and reliability tests (including data from the fall student survey utilized by District XYZ). An internal review for validity and reliability was conducted to provide evidence from pilot administrations of the survey tool (Panorama Education, 2015b).

Panorama Education (2015b) identified that the validity of the tool began with a rigorous design process and was supported through the initial pilot of two large-scale administrations of the survey instrument. The later validation process focused on the content validity as well as the structural and convergent validity of the instrument. A validation process occurred with each of the 10 scales separately as surveys were completed. The validation process for the student survey created by Panorama Education (2015b) was continuous and "over the course of multiple studies, more and more data were accumulated that give potential users of a survey increasing amounts of faith that the survey scales measure what they purport to measure and may be used with confidence" (p. 4). Panorama Education (2015b) identified reliability as a prerequisite to

validity. The survey was assessed using coefficient alpha and the reliability estimates for the scales that were .70 or greater.

Validity and reliability. Lunenburg and Irby (2008) identifed validity as "the degree to which an instrument measures what it purports to measure" (p. 181) and reliability as "the degree to which an instrument consistently measures whatever it is measuring" (p. 182). The fall student survey utilized by District XYZ was a combination of two different instruments. The developers of the instruments utilized for this research have conducted internal validity and reliability tests. Results from the validity and reliability tests will be described.

STAR Reading assessment. For the current study, academic achievement was measured by STAR Reading scaled scores and corresponding achievement level. STAR Reading is a product developed by Renaissance Learning, designed to serve as a periodic progress-monitoring assessment (Renaissance Learning, 2015). Results from STAR Reading provide quick approximations for reading comprehension, identify reading achievement in relationship to national norms, and support longitudinal data tracking for analysis of student growth (Renaissance Learning, 2015). The assessment design is based on Item Response Theory (IRT), meaning the assessment is adaptive to student responses provided throughout the duration of the assessment session (Renaissance Learning, 2015).

Measurement. Student reading ability from the STAR Reading assessment is reported by Renaissance Learning utilizing a variety of scores. STAR Reading scaled score achievement levels were utilized to identify academic achievement for this study. Renaissance Learning (2015) creates the scaled score based on the Rasch ability scale, in order to make the results norm-referenced and comparable across grade levels. Scaled score ranges have been classified by District XYZ (2015b) as *Below Basic*, *Basic*, *Proficient*, and *Advanced* for each assessment window. The proficiency scale utilized for the winter 2016 administration is summarized in Table 4. The achievement levels of *Below Basic* and *Basic* were categorized as *Below Basic and Basic*. The achievement level of *Proficient* and *Advanced* were categorized as *Proficient and Advanced*.

Table 4

	Grade Level Scaled Score Ranges					
Achievement Level	Grade 3	Grade 4	Grade 5			
Below Basic	0-197	0-344	0-445			
Basic	198-344	345-445	446-524			
Proficient	345-445	446-524	525-631			
Advanced	446-1400	525-1400	632-1400			

STAR Reading Scaled Score Achievement Level by Grade Level

Note. Adapted from *scaled score achievement levels*, by District XYZ, 2015b. Copy in possession of the author.

Validity and reliability. The validity of the STAR Reading assessment is evidenced as content validity and construct validity. Items on the assessment are designed to measure progress with reading over time. "Core progress learning progression for reading consists of 36 skills organized within 5 domains of reading and applies the progressions of reading skills and understanding as they develop in sophistication from kindergarten through grade 12" (Renaissance Learning, 2015, p. 19-20). A summary of the skills and domains assessed through STAR Reading is available in Appendix D. Assessment items are written, reviewed, and calibrated to ensure that the items meet content and level specifications.

For construct validity, the STAR Reading assessment was compared to external assessments, including the California Achievement Test (CAT), the Comprehensive Test of Basic Skills (CTBS), the Iowa Test of Basic Skills (ITBS), the Metropolitan Achievement Test (MAT), the Stanford Achievement Test (SAT9), and other statewide assessments (Renaissance Learning, 2015). When comparing STAR Reading to Degrees of Reading Power comprehension assessment, a correlation of 0.89 was determined between the two assessments (Renaissance Learning, 2015).

The STAR Reading assessment is adaptive in nature, and Renaissance Learning (2015) identified that traditional methods of determining reliability coefficients cannot be utilized for reliability testing. Reliability is determined by completing three reliability tests: generic reliability, split-half reliability, and alternate forms reliability. Reliability estimates for the three tests are presented in Table 6.

For generic reliability, an estimated value for the conditional standard errors of measurement (CSEM) and variance in test scores is determined by using the scaled score from STAR Reading and IRT. "Squaring and summing the CSEM values yields an estimate of total squared error; dividing by the observation yields an estimate of mean squared error" (Renaissance Learning, 2015, p. 51). A ratio identified by the scaled score variance is determined, and then 1 is subtracted from the ratio. Results from the generic reliability test indicate an overall score of 0.96. The scores are reported to be consistent across the grade levels of 1-12, with lower scores reported at the lower grade levels of three and four (0.89) and higher scores at the higher grade levels of 10, 11, and 12 (0.93).

A split-half reliability coefficient is determined by splitting the scores into two groups, and a correlation determined between the two groups of scores is used to determine an estimate for the half-length test, and then a Spearman-Brown formula is utilized to determine an estimate for the full-length test. Renaissance Learning (2015) identifies that the "split-half reliability coefficients are independent of the generic reliability approach and more firmly grounded in the item response data" (p. 52). Results from the split-half reliability test indicate an overall score of 0.92, which is reported as consistent across grades 1-12.

The alternate form reliability utilized by Renaissance Learning (2015) is a variation of a test-retest method. This method administers the test twice to the same participants and a correlation is determined with the two sets of test scores. Results from the test-retest method indicate an overall score of 0.91. The scores were not as consistent across grades 1-12, with scores varying from a low of 0.80 in grades 8, 10, and 11 to a high of 0.90 in grade 12. Table 5 identifies reliability estimates for grades 3-5 as determined by Renaissance Learning.

		Reliability Estimates				
	_	Generic	Split-Half		Test-Retest	
Grade	Ν	r	r	Ν	r	Days
3	10,476	.89	.89	297	.82	7
4	9,984	.89	.89	297	.83	7
5	8,352	.90	.89	300	.83	7

Reliability Estimates from STAR Reading Norming Study

Note. Adapted from STAR Reading technical manual, by Renaissance Learning, 2015.

Days = Days between testing.

Data Collection Procedures

Permission to conduct this quantitative study was requested and obtained prior to collecting data. A proposal to conduct this study was submitted to the Baker University Institutional Review Board on January 13, 2021, and approved February 26, 2021 (see Appendices E and F). An Application to Conduct Research was submitted to District XYZ on January 13, 2021, and permission to utilize requested survey and achievement data, including gender identification, was granted on January 15, 2021 (see Appendices G and H).

The first set of data, student survey responses, was obtained through the assistance of the Director of Assessment at District XYZ and organized for the 2149 who completed the survey during the 2016-2017 school year based on the climate and sense of belonging constructs as predetermined by the measurement criteria. The responses on the Likert-type scale were transferred to corresponding numerical values (see Table 3).

Demographic information regarding the participants was obtained through the district data base.

The second set of data, STAR Reading Scaled Scores, was generated for the same students and organized in the same spreadsheet with the survey data. Gender was identified for each student who completed the student survey in grades three, four, and five. The values gathered were numerical in nature and were converted to an achievement level as determined by the scales in Tables 4. In order to complete the hypothesis tests that involved achievement, the category levels of Below Basic and Basic were combined to indicate not meeting the grade level expectation and the category levels of Proficient and Advanced were combined to indicate meeting the grade level expectation for the assessment.

Data Analysis and Hypothesis Testing

Two research questions were designed to address the quantitative component of this study. Eighteen hypotheses were generated to test each of the research questions and a significance level of $\alpha = .05$ was used for all hypothesis testing. The variables utilized for hypothesis testing were perceived sense of belonging, academic achievement, and gender. Two research questions will be presented with 18 hypotheses identified for each of the research questions for a total of 36 hypotheses for this study.

RQ1. To what extent is there a relationship between student achievement, as measured by STAR Reading levels, and elementary students' perceived sense of belonging?

H1. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

H2. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

H3. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

H4. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

H5. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

H6. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

H7. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

H8. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

H9. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

H10. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

H11. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

H12. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

H13. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

H14. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

H15. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

H16. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

H17. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

H18. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

Eighteen chi-square tests of independence were conducted to address RQ1 because the relationship between two categorical variables was analyzed. The two categorical variables for this analysis were achievement levels based on the winter STAR Reading scaled scores (see Table 4) and perceived sense of belonging category identified by numerical values connected to Likert-type responses (see Table 3). A two rows x five columns frequency table was constructed for the two categorical variables. The observed frequencies were compared to those expected by chance.

RQ2. To what extent is there a difference in students' perceived sense of belonging between female and male elementary students?

H19. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

H20. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

H21. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

H22. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

H23. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

H24. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

H25. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school." *H26.* There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school."

H27. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school."

H28. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

H29. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

H30. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

H31. There is a difference in sense of belonging between male and female thirdgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?"

H32. There is a difference in sense of belonging between male and female fourthgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?" *H33.* There is a difference in sense of belonging between male and female fifthgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?"

H34. There is a difference in sense of belonging between male and female thirdgrade students based on Panorama survey question "How much respect do students at your school show you?"

H35. There is a difference in sense of belonging between male and female fourthgrade students based on Panorama survey question "How much respect do students at your school show you?"

H36. There is a difference in sense of belonging between male and female fifthgrade students based on Panorama survey question "How much respect do students at your school show you?"

Eighteen chi-square tests of independence were conducted to address RQ2, because the relationship between two categorical variables was analyzed. The two categorical variables for this analysis were gender, identified as male and female, and perceived sense of belonging category identified by numerical values connected to Likert-type responses (see Table 3). A two rows x five columns frequency table was constructed for each analysis of the two categorical variables. The observed frequencies were compared to those expected by chance. An effect size is reported, when appropriate.

Limitations

Limitations of a study are elements not under the control of the researcher(s) and could influence the interpretation of the results of a study (Lunenburg & Irby 2008). Limitations identified that could have an impact on this study are as follows:

- 1. Student survey responses are based on perceptions; interpretation of survey questions could differ from one respondent to another.
- 2. The STAR Reading assessment was conducted under the direction of multiple instructors; the protocol for each assessment was provided but may have been inconsistent from one classroom to another.
- The researcher had no control regarding effort given by students in each of the key areas of this study: survey responses and STAR Reading assessment responses.

Summary

The study used a non-experimental quantitative design to determine the extent of the relationship between perceptions of sense of belonging, academic achievement, and gender. The population for this study was upper elementary students attending a suburban elementary school in the Midwest. Purposive sampling was utilized for a sample of 2,149 third-, fourth-, and fifth-grade students attending elementary school in one suburban school district in the Kansas City Metropolitan area during the 2016-2017 school year. A student survey was utilized to gather perceptions of student sense of belonging. The STAR Reading assessment was utilized to determine academic achievement based on the achievement status from the Scaled Score.

Chapter 4

Results

The primary purpose of this study was to determine the relationships between student sense of belonging and academic achievement for third-, fourth-, and fifth-grade students. The second purpose of this study was to examine differences in sense of belonging that exists between female and male students in third-, fourth-, and fifth-grade students. The contents of this chapter include descriptive statistics and the results of hypothesis testing.

Descriptive Statistics

The study was conducted using a sample of 2,149 elementary students in grades three, four, and five. All the students included in this study completed both a districtconducted student survey and the STAR Reading assessment during the winter window. The responses to the student survey were utilized as designed, with five categories for each question (see Table 3). The academic achievement levels, based on STAR Reading scores, were organized into four categories initially identified by District XYZ to make academic decisions (see Table 4). The four categories identifying academic achievement were combined into two groupings for the analysis process. The original academic achievement levels of *Below Basic* and *Basic* were recoded into a singular category and became *Below Basic and Basic*. The original academic achievement levels of *Proficient* and *Advanced* were recoded into a singular category and became *Proficient and Advanced*. The number of third-grade students in the below basic and basic category totaled 158 students; the number of third-grade students in the proficient and advanced category totaled 533. See Table 6 for the frequencies and percentages for the original and recoded third-grade academic achievement levels.

Table 6

Achievement Level	Ν	%
Original		
Below Basic	35	5.07
Basic	123	17.80
Proficient	141	20.41
Advanced	392	56.73
Recoded		
Below Basic and Basic	158	22.87
Proficient and Advanced	533	77.13

Frequency and Percentages for Original and Recoded Third-Grade Achievement Levels

The number of fourth-grade students in the below basic and basic category totaled 163 students; the number of fourth-grade students in the proficient and advanced category totaled 538. See Table 7 for the frequencies and percentages for the original and recoded fourth-grade academic achievement levels.

Achievement Level	Ν	%
Original		
Below Basic	72	10.27
Basic	91	12.98
Proficient	151	21.54
Advanced	387	55.21
Recoded		
Below Basic and Basic	163	23.25
Proficient and Advanced	538	76.75

Frequency and Percentages for Original and Recoded Fourth-Grade Achievement Levels

The number of fifth-grade students in the below basic and basic category totaled 175 students; the number of fifth-grade students in the proficient and advanced category totaled 582. See Table 8 for the frequencies and percentages for the original and recoded fourth-grade academic achievement levels.

Achievement Level	Ν	%
Original		
Below Basic	91	12.02
Basic	84	11.10
Proficient	138	18.23
Advanced	444	58.65
Recoded		
Below Basic and Basic	175	23.12
Proficient and Advanced	582	76.88

Frequency and Percentages for Original and Recoded Fifth-Grade Achievement Levels

Hypothesis Testing

Quantitative methods for data analysis were utilized for the study. Hypothesis testing was conducted to answer 2 research questions, and 36 corresponding hypotheses are listed. RQ1 addressed the relationship between academic achievement level, as determined from STAR Reading assessment and perceived sense of belonging, broken down by grade level. RQ2 address the difference between gender and perceived sense of belonging, broken down by grade level. Methods for statistical analysis and results of each test are provided for review.

RQ1. To what extent is there a relationship between student achievement, as measured by STAR Reading levels, and elementary students' perceived sense of belonging?

Eighteen chi-square tests of independence were conducted to address RQ1 because the relationship between two categorical variables was analyzed. The two categorical variables for this analysis were achievement levels based on the winter STAR Reading scaled scores (see Table 2), and perceived sense of belonging category identified by numerical values connected to Likert-type responses (see Table 3). A two rows x five columns frequency table was constructed for the two categorical variables. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate.

H1. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.946$, p = .567. See Table 9 for the observed and expected frequencies. H1 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

Observed and Expected Frequencies for I	Ч.	1	I	l
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Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	2	2.1
	Disagree	2	2.5
	Neutral	12	8.2
	Agree	30	33.8
	Strongly Agree	112	111.4
Proficient and Advanced	Strongly Disagree	7	6.9
	Disagree	9	8.5
	Neutral	24	27.8
	Agree	118	114.2
	Strongly Agree	375	375.6

Note. Two cells have expected count less than 5. The minimum expected count is 2.06.

H2. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 1.113$, p = .892. See Table 10 for the observed and expected frequencies. H2 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

Observed	and	Expecte	d Freau	encies	for	H2
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Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Strongly Disagree	4	3.5
	Disagree	8	6
	Neutral	16	15.3
	Agree	44	46.3
	Strongly Agree	91	91.8
Proficient and Advanced	Strongly Disagree	11	11.5
	Disagree	18	20
	Neutral	50	50.7
	Agree	155	152.7
	Strongly Agree	304	303.2

Note. 1 cell has expected count less than 5. The minimum expected count is 3.49.

H3. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 6.051$, p = .195. See Table 11 for the observed and expected frequencies. H3 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

Observed	and i	Expecte	d Freat	iencies	for	H3
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Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Strongly Disagree	3	3
	Disagree	8	6
	Neutral	15	15.7
	Agree	47	59.4
	Strongly Agree	102	90.9
Proficient and Advanced	Strongly Disagree	10	10
	Disagree	18	20
	Neutral	53	52.3
	Agree	210	197.6
	Strongly Agree	291	302.1

Note. One cell has expected count less than 5. The minimum expected count is 3.01.

H4. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 3.545$, p = .471. See Table 12 for the observed and expected frequencies. H4 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

Observed	and F	vnøctød	Freat	oncios	for	H4
Observeu	ana E.	хрестей	гтеди	encies	jor	114

Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	4	2.5
	Disagree	1	3.4
	Neutral	10	10.7
	Agree	49	49.8
	Strongly Agree	94	91.5
Proficient and Advanced	Strongly Disagree	7	8.5
	Disagree	14	11.6
	Neutral	37	36.3
	Agree	169	168.2
	Strongly Agree	306	308.5

Note. 2 cells have expected count less than 5. The minimum expected count is 2.52.

H5. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.405$, p = .662. See Table 13 for the observed and expected frequencies. H5 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

Ol	bserved	and	'Expected	Free	quencies j	for	H_{5}
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Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	5	4.0
	Disagree	5	6.8
	Neutral	18	19.1
	Agree	43	48.0
	Strongly Agree	92	85.2
Proficient and Advanced	Strongly Disagree	12	13.0
	Disagree	24	22.2
	Neutral	64	62.9
	Agree	163	158.0
	Strongly Agree	274	280.8

Note. One cell has expected count less than 5. The minimum expected count is 3.96.

H6. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.330$, p = .675. See Table 14 for the observed and expected frequencies. H6 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

Observed	and Ex	nected Fi	reauencies	for H	6
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Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	7	4.6
	Disagree	8	7.9
	Neutral	14	17.1
	Agree	60	59.9
	Strongly Agree	86	85.5
Proficient and Advanced	Strongly Disagree	13	154.4
	Disagree	26	26.1
	Neutral	60	56.9
	Agree	199	199.1
	Strongly Agree	284	284.5

Note. One cell has expected count less than 5. The minimum expected count is 4.62.

H7. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated a marginally significant difference between the observed and expected values, $\chi^2(4) = 7.754$, p = .101. See Table 15 for the observed and expected frequencies. H7 was to some extent supported. Although it is not statistically significant at $\alpha = .05$, there is some evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

Ol	bserved	and	Expected	Free	juencies j	for	H7
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Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Strongly Disagree	5	3.9
	Disagree	10	6.6
	Neutral	23	21.0
	Agree	34	46.4
	Strongly Agree	86	80.0
Proficient and Advanced	Strongly Disagree	12	13.1
	Disagree	19	22.4
	Neutral	69	71.0
	Agree	169	156.6
	Strongly Agree	264	270.0

Note. One cell has expected count less than 5. The minimum expected count is 3.89.

H8. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 4.481$, p = .345. See Table 16 for the observed and expected frequencies. H8 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging in this school."

Observed	and Ex	cnected	Freque	ncies i	for H8
Observeu	unu L	pecieu	reque	icies j	101 110

Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	11	6.7
	Disagree	8	9.3
	Neutral	28	25.3
	Agree	54	57.7
	Strongly Agree	62	63.9
Proficient and Advanced	Strongly Disagree	18	22.3
	Disagree	32	30.7
	Neutral	81	82.7
	Agree	194	190.3
	Strongly Agree	213	211.1

Note. Zero cells have expected count less than 5. The minimum expected count is 6.74.

H9. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.105$, p = .716. See Table 17 for the observed and expected frequencies. H9 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging in this school."

Observed and Exp	pected Frequen	icies for H9
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Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	6	3.9
	Disagree	10	10.9
	Neutral	24	26.8
	Agree	68	69.4
	Strongly Agree	67	64.0
Proficient and Advanced	Strongly Disagree	11	13.1
	Disagree	37	36.1
	Neutral	92	89.2
	Agree	232	230.6
	Strongly Agree	210	213.0

Note. One cell has expected count less than 5. The minimum expected count is 3.93.

H10. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated a marginally significant difference between the observed and expected values, $\chi^2(4) = 9.033$, p = .060. See Table 18 for the observed and expected frequencies. H10 was to some extent supported. Although it is not statistically significant at $\alpha = .05$, there is some evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on

Advanced Questionnaire item "Students in this school respect differences in other students."

Table 18

Observed and Expected Frequencies for H10

Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Strongly Disagree	1	3.7
Proficient and Advanced	Disagree	13	11.9
	Neutral	19	22.6
	Agree	36	44.8
	Strongly Agree	89	75.0
	Strongly Disagree	15	12.3
	Disagree	39	40.1
	Neutral	80	76.4
	Agree	160	151.2
	Strongly Agree	239	253.0

Note. One cell has expected count less than 5. The minimum expected count is 3.66.

H11. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 11.745$, p = .019, Cramer's V = .129. See Table 19 for the observed and expected frequencies. The observed frequency for fourth-grade students who scored Below Basic or Basic and responded Neutral on the AQ item (n = 33) was higher than the expected frequency (n = 1000) and the expected

26.7). The observed frequency for fourth-grade students who scored Below Basic or Basic and responded Strongly Agree on the AQ item (n = 76) was higher than the expected frequency (n = 65.8). The observed frequency for fourth-grade students who scored Proficient or Advanced and responded Agree on the AQ item (n = 187) was higher than the expected frequency (n = 169.6). H11 was supported. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students." The effect size indicated a moderate effect.

Table 19

Achievement	Belonging	$f_{ m observed}$	$f_{ ext{expected}}$
Below Basic and Basic	Strongly Disagree	6	5.3
	Disagree	14	13.7
	Neutral	33	26.7
	Agree	34	51.4
	Strongly Agree	76	65.8
Proficient and Advanced	Strongly Disagree	17	17.7
	Disagree	45	45.3
	Neutral	82	88.3
	Agree	187	169.6
	Strongly Agree	207	217.2

Observed and Expected Frequencies for H11

Note. Zero cells have expected count less than 5. The minimum expected count is 5.35

H12. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 9.706$, p = .046, Cramer's V = .113. See Table 20 for the observed and expected frequencies. The observed frequency for fifth-grade students who scored Below Basic or Basic and responded Strongly Disagree on the AQ item (n = 16) was higher than the expected frequency (n = 8.6). The observed frequency for fifth-grade students who scored Proficient or Advanced and responded Disagree on the AQ item (n = 46) was higher than the expected frequency (n = 43.0). The observed frequency for fifth-grade students who scored Proficient or Advanced and responded Neutral on the AQ item (n = 92) was higher than the expected frequency (n = 89.1). H12 was supported. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students." The effect size indicated a moderate effect.
Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Strongly Disagree	16	8.6
	Disagree	10	13.0
	Neutral	24	26.9
	Agree	65	66.2
	Strongly Agree	60	60.4
Proficient and Advanced	Strongly Disagree	21	28.4
	Disagree	46	43.0
	Neutral	92	89.1
	Agree	221	219.8
	Strongly Agree	201	200.6

Note. Zero cells have expected count less than 5. The minimum expected count is 8.56.

H13. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 7.298$, p = .121. See Table 21 for the observed and expected frequencies. H13 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

Observed	and Expected	Frequencie.	s for	H13
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Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Do Not Belong	7	5.5
	Belong a Little Bit	14	11.7
	Belong Somewhat	16	15.5
	Belong Quite a Bit	32	45.0
	Completely Belong	89	80.3
Proficient and Advanced	Do Not Belong	17	18.5
	Belong a Little Bit	37	39.3
	Belong Somewhat	52	52.5
	Belong Quite a Bit	165	152.0
	Completely Belong	262	270.7

Note. One cell has expected count less than 5. The minimum expected count is 5.49.

H14. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 6.903$, p = .141. See Table 22 for the observed and expected frequencies. H14 was not supported. There is no evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

Observed	and Expected	l Frequencie	es for H14
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Achievement	Belonging	$f_{ m observed}$	f_{expected}
Below Basic and Basic	Do Not Belong	12	8.8
	Belong a Little Bit	16	14.2
	Belong Somewhat	26	24.2
	Belong Quite a Bit	33	45.3
	Completely Belong	76	70.5
Proficient and Advanced	Do Not Belong	26	29.2
	Belong a Little Bit	45	46.8
	Belong Somewhat	78	79.8
	Belong Quite a Bit	162	149.7
	Completely Belong	227	232.5

Note. Zero cells have expected count less than 5. The minimum expected count is 8.84.

H15. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated a marginally significant difference between the observed and expected values, $\chi^2(4) = 7.646$, p = .105. See Table 23 for the observed and expected frequencies. H15 was to some extent supported. Although it is not statistically significant at $\alpha = .05$, there is some evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	Do Not Belong	6	7.4
	Belong a Little Bit	6	11.6
	Belong Somewhat	26	25.9
	Belong Quite a Bit	58	63.8
	Completely Belong	79	66.3
Proficient and Advanced	Do Not Belong	26	24.6
	Belong a Little Bit	44	38.4
	Belong Somewhat	86	86.1
	Belong Quite a Bit	218	212.2
	Completely Belong	208	220.7

Note. Zero cells have expected count less than 5. The minimum expected count is 7.40.

H16. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 15.198$, p = .004, Cramer's V = .148. See Table 24 for the observed and expected frequencies. The observed frequency for third-grade students who scored Below Basic or Basic and responded A Little Bit of Respect on the AQ item (n = 18) was higher than the expected frequency (n = 13.9). The observed frequency for third-grade students who scored Below Basic or Basic and responded A Great Deal of Respect on the AQ item (n = 59) was higher than the observed frequency (n = 45.3). The observed frequency for third-grade students who scored Proficient or Advanced and responded Quite a Bit of Respect on the AQ item (n = 231) was higher than the observed frequency (n = 211.3). H16 was supported. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and third-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?" The effect size indicated a strong effect.

Table 24

Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	No Respect at All	5	4.1
	A Little Bit of Respect	18	13.9
	Some Respect	33	32.0
	Quite a Bit of Respect	43	62.7
	A Great Deal of Respect	59	45.3
Proficient and Advanced	No Respect at All	13	13.9
	A Little Bit of Respect	43	47.1
	Some Respect	107	108.0
	Quite a Bit of Respect	231	211.3
	A Great Deal of Respect	139	152.7

Observed and Expected Frequencies for H16

Note. One cell has expected count less than 5. The minimum expected count is 4.12.

H17. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 14.739$, p = .005, Cramer's V = .145. See Table 25 for the observed and expected frequencies. The observed frequency for fourth-grade students who scored Below Basic or Basic and responded No Respect at All on the AQ item (n = 10) was higher than the expected frequency (n = 6.0). The observed frequency for fourth-grade students who scored Below Basic or Basic and responded A Little Bit of Respect on the AQ item (n = 25) was lower than the expected frequency (n = 21.4). The observed frequency for fourth-grade students who scored Below Basic or Basic and responded A Great Deal of Respect on the AQ item (n = 50) was higher than the observed frequency (n = 38.1). The observed frequency for fourth-grade students who scored Proficient or Advanced and responded Some Respect on the AQ item (n = 128) was higher than the observed frequency (n = 128)133.5). The observed frequency for fourth-grade students who scored Proficient or Advanced and responded Quite a Bit of Respect on the AQ item (n = 203) was higher than the observed frequency (n = 188.0). H17 was supported. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fourth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?" The effect size indicated a moderate effect.

<i>Observed and Expected Frequencies fo</i>	or H17	/
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Achievement	Belonging	$f_{ m observed}$	fexpected
Below Basic and Basic	No Respect at All	10	6.0
	A Little Bit of Respect	25	21.4
	Some Respect	36	40.5
	Quite a Bit of Respect	42	57.0
	A Great Deal of Respect	50	38.1
Proficient and Advanced	No Respect at All	16	20.0
	A Little Bit of Respect	67	70.6
	Some Respect	138	133.5
	Quite a Bit of Respect	203	188.0
	A Great Deal of Respect	114	125.9

Note. Zero cells have expected count less than 5. The minimum expected count is 6.05.

H18. There is a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated a marginally significant difference between the observed and expected values, $\chi^2(4) = 8.151$, p = .086. See Table 26 for the observed and expected frequencies. H18 was to some extent supported. Although it is not statistically significant at $\alpha = .05$, there is some evidence for a relationship between academic achievement levels, as determined from STAR Reading scores, and fifth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

Observed and Expected Freque	encies	for	H18
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Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Below Basic and Basic	No Respect at All	11	6.9
	A Little Bit of Respect	23	18
	Some Respect	33	35.4
	Quite a Bit of Respect	60	71.4
	A Great Deal of Respect	48	43.2
Proficient and Advanced	No Respect at All	19	23.1
	A Little Bit of Respect	55	60.0
	Some Respect	120	117.6
	Quite a Bit of Respect	249	237.6
	A Great Deal of Respect	139	143.8

Note. Zero cells have expected count less than 5. The minimum expected count is 6.94.

RQ2. To what extent is there a difference in students' perceived sense of belonging between female and male elementary students?

Eighteen chi-square tests of independence were conducted to address RQ2 because the relationship between two categorical variables was analyzed. The two categorical variables for this analysis were gender, identified as male and female, and perceived sense of belonging category identified by numerical values connected to Likert-type responses (see Table 3). A two rows x five columns frequency table was constructed for the two categorical variables. The observed frequencies were compared to those expected by chance. The level of significance was set at .05. An effect size is reported, when appropriate. *H19.* There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 3.464$, p = .483. See Table 27 for the observed and expected frequencies. H19 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

Table 27

Gender	Belonging	$f_{ m observed}$	f_{expected}
Female	Strongly Disagree	5	4.8
	Disagree	6	5.8
	Neutral	14	19.1
	Agree	76	78.4
	Strongly Agree	265	257.9
Male	Strongly Disagree	4	4.2
	Disagree	5	5.2
	Neutral	22	16.9
	Agree	72	69.6
	Strongly Agree	222	229.1

Ol	oserved	and	Expected	' Freq	uencies f	or.	H1	9
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Note. Two cells have expected count less than 5. The minimum expected count is 4.23.

H20. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 1.734$, p = .784. See Table 28 for the observed and expected frequencies. H20 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me."

Table 28

Gender	Belonging	$f_{ m observed}$	fexpected
Female	Strongly Disagree	9	7.8
	Disagree	12	13.5
	Neutral	31	34.2
	Agree	101	103.0
	Strongly Agree	210	204.5
Male	Strongly Disagree	6	7.2
	Disagree	14	12.5
	Neutral	35	31.8
	Agree	98	96.0
	Strongly Agree	185	190.5

Observed and Expected Frequencies for H20

Note. Zero cells have expected count less than 5. The minimum expected count is 7.23.

H21. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Teachers in my school really care about me."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 13.479$, p = .009, Cramer's V = .133. See Table 29 for the observed and expected frequencies. The observed frequency for female fifth-grade students who responded Strongly Agree on the AQ item (n = 218) was higher than the expected frequency (n = 200.4). The observed frequency for male fifth-grade students who responded Strongly Disagree on the AQ item (n = 11) was higher than the observed frequency (n = 6.4). The observed frequency for male fifth-grade students who responded Disagree on the AQ item (n = 11) was higher than the observed frequency (n = 6.4). The observed frequency for male fifth-grade students who responded Disagree on the AQ item (n = 17) was higher than the observed frequency for male fifth-grade students who responded Disagree on the AQ item (n = 17) was higher than the observed frequency for male fifth-grade students who responded Disagree on the AQ item (n = 16.4). The observed frequency for male fifth-grade students who responded Disagree on the AQ item (n = 17) was higher than the observed frequency (n = 12.7). The observed frequency for male fifth-grade students who responded Agree on the AQ item (n = 133) was higher than the observed frequency (n = 126.0). H21 was supported. There is a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me." The effect size indicated a moderate effect.

Gender	Belonging	$f_{ m observed}$	fexpected
Female	Strongly Disagree	2	6.6
	Disagree	9	13.3
	Neutral	33	34.7
	Agree	124	131.0
	Strongly Agree	218	200.4
Male	Strongly Disagree	11	6.4
	Disagree	17	12.7
	Neutral	35	33.3
	Agree	133	126.0
	Strongly Agree	175	192.6

Observed and Expected Frequencies for H21

Note. Zero cells have expected count less than 5. The minimum expected count is 6.37.

H22. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.888$, p = .577. See Table 30 for the observed and expected frequencies. H22 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Strongly Disagree	6	5.8
	Disagree	9	7.9
	Neutral	22	24.9
	Agree	108	115.5
	Strongly Agree	221	211.9
Male	Strongly Disagree	5	5.2
	Disagree	6	7.1
	Neutral	25	22.1
	Agree	110	102.5
	Strongly Agree	179	188.1

Observed and Expected Frequencies for H22

Note. Zero cells have expected count less than 5. The minimum expected count is 5.17.

H23. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 2.906$, p = .574. See Table 31 for the observed and expected frequencies. H23 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fourth--grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers treat me with respect."

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Strongly Disagree	7	8.8
	Disagree	15	15.0
	Neutral	43	42.5
	Agree	99	106.8
	Strongly Agree	199	189.8
Male	Strongly Disagree	10	8.2
	Disagree	14	14.0
	Neutral	39	39.5
	Agree	107	99.2
	Strongly Agree	167	176.2

Observed and Expected Frequencies for H23

Note. Zero cells have expected count less than 5. The minimum expected count is 8.18.

H24. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Teachers treat me with respect."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 13.808$, p = .008, Cramer's V = .077. See Table 32 for the observed and expected frequencies. The observed frequency for female fifth-grade students who responded Strongly agree on the AQ item (n = 206) was higher than the expected frequency (n = 188.7). The observed frequency male fifth-grade students who responded Strongly Disagree on the AQ item (n = 15) was higher than the observed frequency (n = 9.8). The observed frequency male fifth-grade students who responded Disagree on the AQ item (n = 23) was higher than the observed frequency (n = 16.7). The observed frequency male fifth-grade students who responded Agree on the AQ item (n = 132) was higher than the observed frequency (n = 126.9). H21 was supported. There is a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Teachers in my school really care about me." The effect size indicated a weak effect.

Table 32

Gender	Belonging	$f_{ m observed}$	f_{expected}
Female	Strongly Disagree	5	10.2
	Disagree	11	17.3
	Neutral	37	37.7
	Agree	127	132.1
	Strongly Agree	206	188.7
Male	Strongly Disagree	15	9.8
	Disagree	23	16.7
	Neutral	37	36.3
	Agree	132	126.9
	Strongly Agree	164	181.3

Observed and Expected Frequencies for H24

Note. Zero cells have expected count less than 5. The minimum expected count is 9.80.

H25. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = .475$, p = .976. See Table 33 for the observed and expected frequencies. H25 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

Table 33

Gender	Belonging	$f_{ m observed}$	f_{expected}
Female	Strongly Disagree	9	9.0
	Disagree	14	15.4
	Neutral	48	48.7
	Agree	206	107.5
	Strongly Agree	189	185.4
Male	Strongly Disagree	8	8.0
	Disagree	15	13.6
	Neutral	44	43.3
	Agree	97	95.5
	Strongly Agree	161	164.6

Observed and Expected Frequencies for H25

Note. Zero cells have expected count less than 5. The minimum expected count is 8.00.

H26. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 3.251$, p = .517. See Table 34 for the observed and expected frequencies. H26 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school."

Table 34

Observed and Expected Frequencies for H26

Gender	Belonging	$f_{ m observed}$	f_{expected}
Female	Strongly Disagree	14	15.0
	Disagree	24	20.7
	Neutral	62	56.4
	Agree	121	128.4
	Strongly Agree	142	142.4
Male	Strongly Disagree	15	14.0
	Disagree	16	19.3
	Neutral	47	52.6
	Agree	127	119.6
	Strongly Agree	133	132.6

Note. Zero cells have expected count less than 5. The minimum expected count is 13.98.

H27. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "There is a feeling of belonging at my school."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 14.763$, p = .005, Cramer's V = .140. See Table 35 for the observed and expected frequencies. The observed frequency for female fifth-grade students who responded Strongly Agree on the AQ item (n = 166) was higher than the expected frequency (n = 141.2). The observed frequency male fifth-grade students who responded Strongly Disagree on the

AQ item (n = 11) was higher than the observed frequency (n = 8.3). The observed frequency male fifth-grade students who responded Disagree on the AQ item (n = 25)was higher than the observed frequency (n = 23.0). The observed frequency male fifthgrade students who responded Neutral on the AQ item (n = 62) was higher than the observed frequency (n = 56.9). The observed frequency male fifth-grade students who responded Agree on the AQ item (n = 162) was higher than the observed frequency (n =147.0). H21 was supported. There is a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school." The effect size indicated a moderate effect.

Table 35

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Strongly Disagree	6	8.7
	Disagree	20	24.0
	Neutral	54	59.1
	Agree	138	153.0
	Strongly Agree	166	141.2
Male	Strongly Disagree	11	8.3
	Disagree	25	23.0
	Neutral	62	56.9
	Agree	162	147.0
	Strongly Agree	111	135.8

OOSCI VCU UIU DAPCCICU I ICGUCIICICS $[OI II 2]$	Observed	and Expected	Frequen	cies for	· H27
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Note. Zero cells have expected count less than 5. The minimum expected count is 8.33.

H28. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 1.402$, p = .844. See Table 36 for the observed and expected frequencies. H28 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

Table 36

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Strongly Disagree	8	8.5
	Disagree	26	27.5
	Neutral	57	52.4
	Agree	100	103.8
	Strongly Agree	175	173.7
Male	Strongly Disagree	8	7.5
	Disagree	26	24.5
	Neutral	42	46.6
	Agree	96	92.2
	Strongly Agree	153	154.3

Ol	bserved	and	Expected	Freq	uencies	for	H28
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Note. Zero cells have expected count less than 5. The minimum expected count is 7.53.

H29. There is a difference in sense of belonging between male and female fourthgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 11.303$, p = .023, Cramer's V = .127. See Table 37 for the observed and expected frequencies. The observed frequency for female fourth-grade students who responded Disagree on the AQ item (n = 33) was higher than the expected frequency (n = 30.6). The observed frequency for female fourth-grade students who responded Neutral on the AQ item (n = 71) was higher than the expected frequency (n = 59.6). The observed frequency for female fourth-grade students who responded Neutral on the AQ item (n = 71) was higher than the expected frequency (n = 59.6). The observed frequency for female fourth-grade students who responded Agree on the AQ item (n = 121) was higher than the expected frequency (n = 114.4). The observed frequency male fourth-grade students who responded Strongly Agree on the AQ item (n = 156) was higher than the observed frequency (n = 136.5). H29 was supported. There is a relationship between gender, identified as female and male, and fourth-grade students' perceived sense of belonging based on Advanced Questionnaire item "There is a feeling of belonging at my school." The effect size indicated a moderate effect.

Gender	Belonging	$f_{ m observed}$	fexpected
Female	Strongly Disagree	11	11.9
	Disagree	33	30.6
	Neutral	71	59.6
	Agree	121	114.4
	Strongly Agree	127	146.5
Male	Strongly Disagree	12	11.1
	Disagree	26	28.4
	Neutral	44	55.4
	Agree	100	106.6
	Strongly Agree	156	136.5

Observed and Expected Frequencies for H29

Note. Zero cells have expected count less than 5. The minimum expected count is 11.09.

H30. There is a difference in sense of belonging between male and female fifthgrade students based on Advanced Questionnaire item "Students in this school respect differences in other students."

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 4.259$, p = .372. See Table 38 for the observed and expected frequencies. H30 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Advanced Questionnaire item "Students in this school respect differences in other students."

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Strongly Disagree	20	18.8
	Disagree	27	28.5
	Neutral	66	59.1
	Agree	134	145.6
	Strongly Agree	138	132.9
Male	Strongly Disagree	17	18.2
	Disagree	29	27.5
	Neutral	50	56.9
	Agree	152	140.4
	Strongly Agree	123	128.1

Observed and Expected Frequencies for H30

Note. Zero cells have expected count less than 5. The minimum expected count is 18.16.

H31. There is a difference in sense of belonging between male and female thirdgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 5.403$, p = .248. See Table 39 for the observed and expected frequencies. H31 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

Achievement	Belonging	$f_{ m observed}$	f_{expected}
Female	Do Not Belong	12	12.7
	Belong a Little Bit	23	27.0
	Belong Somewhat	30	36.0
	Belong Quite a Bit	114	104.3
	Completely Belong	187	185.9
Male	Do Not Belong	12	11.3
	Belong a Little Bit	28	24.0
	Belong Somewhat	38	32.0
	Belong Quite a Bit	83	92.7
	Completely Belong	164	165.1

Observed and Expected Frequencies for H31

Note. Zero cells have expected count less than 5. The minimum expected count is 11.29

H32. There is a difference in sense of belonging between male and female fourthgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 6.908$, p = .141. See Table 40 for the observed and expected frequencies. H32 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fourth-grade students' perceived sense of belonging based on Panorama survey question "Overall, how much do you feel you belong at your school?"

Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Do Not Belong	17	19.7
	Belong a Little Bit	39	31.6
	Belong Somewhat	50	53.9
	Belong Quite a Bit	93	101.0
	Completely Belong	164	156.9
Male	Do Not Belong	21	18.3
	Belong a Little Bit	22	29.4
	Belong Somewhat	54	50.1
	Belong Quite a Bit	102	94.0
	Completely Belong	139	146.1

Observed and Expected Frequencies for H32

Note. Zero cells have expected count less than 5. The minimum expected count is 18.32

H33. There is a difference in sense of belonging between male and female fifthgrade students based on Panorama survey question "Overall, how much do you feel you belong at your school?"

The results of the chi-square test of independence indicated a statistically significant difference between the observed and expected values, $\chi^2(4) = 12.139$, p = .016, Cramer's V = .127. See Table 41 for the observed and expected frequencies. The observed frequency for female fourth-grade students who responded Completely Belong on the AQ item (n = 168) was higher than the expected frequency (n = 146.3). The observed frequency male fifth-grade students who responded Belong a Little Bit on the AQ item (n = 27) was higher than the observed frequency (n = 24.5). The observed frequency male fifth-grade students who responded Belong Quite a Bit on the AQ item (n = 154) was higher than the observed frequency (n = 135.5). H29 was supported. There is a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Panorama survey question "There is a feeling of belonging at my school." The effect size indicated a moderate effect.

Table 41

Achievement	Belonging	$f_{ m observed}$	$f_{expected}$
Female	Do Not Belong	16	16.3
	Belong a Little Bit	23	25.5
	Belong Somewhat	57	57.1
	Belong Quite a Bit	122	140.7
	Completely Belong	168	146.3
Male	Do Not Belong	16	15.7
	Belong a Little Bit	27	24.5
	Belong Somewhat	55	54.9
	Belong Quite a Bit	154	135.3
	Completely Belong	119	140.7

Observed and Expected Frequencies for H33

Note. Zero cells have expected count less than 5. The minimum expected count is 15.68.

H34. There is a difference in sense of belonging between male and female thirdgrade students based on Advanced Questionnaire item "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 3.187$, p = .527. See Table 42 for the observed and expected frequencies. H34 was not supported. There is no evidence for a relationship between gender, identified as female and male, and third-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

Table 42

Gender	Belonging	$f_{ m observed}$	$f_{ ext{expected}}$
Female	No Respect at All	12	9.5
	A Little Bit of Respect	34	32.3
	Some Respect	73	74.2
	Quite a Bit of Respect	150	1145.1
	A Great Deal of Respect	97	104.9
Male	No Respect at All	6	8.5
	A Little Bit of Respect	27	28.7
	Some Respect	67	65.8
	Quite a Bit of Respect	124	128.9
	A Great Deal of Respect	101	93.1

Observed and Expected Frequencies for H34

Note. Zero cells have expected count less than 5. The minimum expected count is 8.47.

H35. There is a difference in sense of belonging between male and female fourthgrade students based on Panorama survey question "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated a marginally significant difference between the observed and expected values, $\chi^2(4) = 8.543$, p = .074. See Table 43 for the observed and expected frequencies. H35 was to some extent supported. Although it is not statistically significant at $\alpha = .05$, there is some evidence for a relationship between gender, identified as female and male, and fourth-grade

students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

Table 43

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	No Respect at All	9	13.5
	A Little Bit of Respect	52	47.6
	Some Respect	102	90.1
	Quite a Bit of Respect	119	126.9
	A Great Deal of Respect	81	84.9
Male	No Respect at All	17	12.5
	A Little Bit of Respect	40	44.4
	Some Respect	72	83.9
	Quite a Bit of Respect	126	118.1
	A Great Deal of Respect	83	79.1

Observed and Expected Frequencies for H35

Note. Zero cells have expected count less than 5. The minimum expected count is 12.54.

H36. There is a difference in sense of belonging between male and female fifthgrade students based on Panorama survey question "How much respect do students at your school show you?"

The results of the chi-square test of independence indicated no difference between the observed and expected values, $\chi^2(4) = 5.889$, p = .208. See Table 44 for the observed and expected frequencies. H36 was not supported. There is no evidence for a relationship between gender, identified as female and male, and fifth-grade students' perceived sense of belonging based on Panorama survey question "How much respect do students at your school show you?"

Gender	Belonging	$f_{ m observed}$	$f_{expected}$
Female	No Respect at All	16	15.3
	A Little Bit of Respect	41	39.8
	Some Respect	82	78.0
	Quite a Bit of Respect	166	157.6
	A Great Deal of Respect	81	95.4
Male	No Respect at All	14	14.7
	A Little Bit of Respect	37	38.2
	Some Respect	71	75.0
	Quite a Bit of Respect	143	151.4
	A Great Deal of Respect	106	91.6

Observed and Expected Frequencies for H36

Note. Zero cells have expected count less than 5. The minimum expected count is 14.70.

Summary

Chapter 4 included the results of hypothesis testing and analysis of the data related to academic achievement, gender, and students' perceptions of sense of belonging. The results of the chi-square test of independence for the relationship between academic achievement and sense of belonging, as a well as the difference in gender and sense of belonging were presented. Chapter 5 includes the interpretation and study summary, major findings, findings related to the literature, and the conclusions.

Chapter 5

Interpretation and Recommendations

The purpose of this research was to identify if there exists a relationship between student sense of belonging, student achievement, and gender at the elementary level. This chapter provides an overview of essential content from chapters one through four. Additionally, this chapter will include a study summary, findings related to the literature, implications for action, and recommendations for future research.

Study Summary

This was a quantitative study with a primary focus to examine the relationships between elementary students' perception of school belonging from a student survey and students' achievement on the STAR Reading assessment. The secondary focus from this quantitative study examined the differences that exist between sense of belong and gender. In this section, a brief overview of chapters one through four is provided. This section provides an overview of the problem, purpose statement and research questions, review of the methodology, and the major findings of the study.

Overview of the problem. District XYZ surveys students to understand their view of the social culture and belonging in the school system, yet does not directly make connections between perceptions of school belonging with academic achievement, gender, or other demographic factors of students (District XYZ, 2016). Having a deeper understanding of how school culture, relational dynamics within all members of the school community, or social connections impact achievement is an essential layer of supporting the development of the whole student while the student progresses through the

school system. Knowledge conveyed in the field of research focused on elementary age students' perceived sense of belonging seems to be lacking. The majority of the research on student sense of belonging in the school setting centers on students attending the middle school, high school, and college levels.

Purpose statement and research questions. The first purpose of this study was to analyze the relationship between academic achievement and elementary students' perceptions of school belonging. The second purpose of this study was to identify if a difference exists in students' sense of belonging between female and male students at the elementary level. Two research questions were identified with a total of 36 hypotheses tested to address the areas of focus for this study.

Review of the methodology. The current study involved the use of a purposive sampling of elementary students attending a suburban elementary school who completed a student survey implemented by the attending school district, and the STAR Reading assessment during the winter window of the 2016-2017 school year. Eighteen chi-square tests of independence were conducted to determine the strength and relationship between the variables of student achievement for third-, fourth-, and fifth-grade students and their perceived sense of belonging. Eighteen chi-square tests of independence were conducted to determine the variables of gender and sense of belonging for the third-, fourth-, and fifth-grade students.

Major findings. Results from this study were mixed for both research questions. Differences in responses to the survey questions indicate varying perceptions of school belonging related to achievement, as well as varying perspectives of school belonging based on gender. A summary of findings for each research question is provided below. Results for research question one were mixed when identifying a relationship between all factors of belonging based on the survey questions presented to students and the achievement level of third-, fourth-, and fifth-grade students. Findings for the relationship between academic achievement and sense of belonging were significant where the survey questions about belonging were focused on perceived levels of respect exhibited from peers within the school setting. The findings did not show a pattern, as mixed results were seen in the survey question responses based on academic achievement and sense of belonging, but what is noteworthy is that all three grade levels indicated either a statistically significant or marginally significant result for both questions related to belonging based on peer respect. For the rest of the findings, academic achievement did not have a relationship with student sense of belonging.

Results for research question two were mixed when identifying a difference between female and male students and their perceptions of belonging for third-, fourth-, and fifth-grade students. For the relationship between gender and sense of belonging, a meaningful difference at the fourth-grade level exists between female and male students when referring to respect identified between peers, but that difference does not exist at the fifth-grade level. Female fifth-grade students identified a more positive sense of belonging and relationship with teachers based on level of care and respect than male students. For the rest of the findings, gender differences did not have a relationship with students' sense of belonging.

Findings Related to the Literature

The feeling of belonging to a community of learners within a school is considered necessary for student academic success in the learning environment (Beck & Malley,

1998). The first research question in the current study examined the relationship between academic achievement and sense of belonging. There was a statistically significant relationship between academic achievement and belonging when the area of belonging focused on peer relationships. This is an important area to consider for students when they are trying to determine their sense of belonging. When students feel they are socially accepted by peers, their long-term connection to the school increases (Gowing & Jackson, 2016). The results are inconclusive regarding the specific trends for academic achievement and belonging with all three grade levels in the study, but variability exists, potentially indicating peer relationships are not as strong for students across the grade levels.

The second research question in the current study examined gender differences and sense of belonging. One of the areas that was statistically significant in this study was related to fifth-grade differences with their perspective on teacher-student relationships. Feeling strong support from teachers has been identified as a leading contributor to a positive sense of school belonging (Allen et al., 2018). In this study, the findings indicated that females felt a stronger positive relationship with the adults in the schools, than the male students. This study supports the research, indicating that female students have a stronger sense of belonging than males (Allen et al., 2018; Goodenow, 1992; Osterman, 2000; Sari, 2012), when reviewing the fifth-grade results identifying differences between female students and male students with their overall belonging and teacher relationships.

Conclusions

This section includes conclusions drawn from the current study regarding students' sense of belonging in relationship to academic achievement and gender differences. This section specifically identifies implications for action and recommendations for future research based on the study. Concluding remarks are also presented to synthesize this study and work for schools to consider when developing systems of support for students.

Implications for action. The results from the current study have several implications for action for school personnel. Results from belonging questions pertaining to peer respect showed a statistically significant and marginally significant relationship for all three grade levels. The specific differences of perceptions were mixed for all three grade levels, which does not identify why perceptions of peer respect impact sense of belonging for the students, yet this indicates that peer relationships are not solid for the students. The differing views of peer respect impact how students connect to peers while learning. A few conclusions that could be drawn are that students are noticing differences in how peers treat others in the learning community, working through how to respect differences in the diverse student population, and trying to figure out how they fit in with peers in the context of the learning environment. This, in turn, could impact the level of focus for students and interfere in the learning process. It would be important for school personnel to focus on developing quality relationships with peers and foster a school culture that values and respects differences among members of the school community. School personnel may want to investigate the best methods, systems, or

programs to help build a community of learners, so students deepen their respect of and for the unique personalities of students in each classroom.

Results regarding gender and the sense of belonging identify statistically significant differences with fifth-grade students pertaining to teacher relationships and their overall feeling of belonging. Female students show a higher sense of belonging than males with the adults in the school community, based on questions pertaining to the level of care and respect demonstrated by the adults and their overall feeling of belonging to the school community. A conclusion that could be drawn is that as male students grow older in the school context, they might pull away some from the adults and importance of the teacher-student relationship begins to diminish. One factor that could begin to impact the relationship between male students and staff could be that the population of teachers is made up mainly of females. It is important for school staff to recognize that male students may connect more with teaching staff if other males are represented in the teaching population. As schools recruit and hire teachers, it would be important to seek out male candidates at the equivalent level as female candidates. The difference in perception of belonging in the school community could increase if male students see themselves represented in the staff throughout their learning career.

Recommendations for future research. The first recommendation for future research would be to replicate this same study over time to see if the results with different groups of third-, fourth-, and fifth-grade students would reveal the same conclusions. Additionally, it would be interesting to follow a particular cohort of students over time to see how their perceptions of belonging change as they progress through their school experience. A second recommendation for future research would be to replicate this

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same study in rural, suburban, and urban districts in the state to determine differences within and among various sized school communities. This would benefit all districts to see how larger community dynamics impact student perceptions within the school community. The third recommendation for future research would be to determine how race and socio-economic status may be related to students' sense of belonging. Only one student demographic was chosen for this current study, but it would benefit staff to see how other demographic factors impact student sense of belonging in order to proactively create systems to keep all students connected to the school community equally. A final recommendation for future study would be to conduct a qualitative study with third-, fourth-, and fifth-grade students involving interviews to deepen the understanding of factors that influence the teacher-student relationship and peer relationships that have an overall impact on sense of belonging. It would be helpful to school staff to ask questions to better understand why differences in how student-perceived peer relationships exist, as well as how students view changes in relationships with staff. Understanding deeper layers of the social dynamics would assist school personnel with identifying systems and programs that may increase the connection with the whole learning community.

Concluding remarks. Two focus areas were designed for this study to understand better how student sense of school belonging is related to academic achievement, as well as how gender differences play a role in perceptions of belonging. While results from the study were mixed, there is a need for school personnel to develop ways to create meaningful and respectful relationships among all members of the school community. The mixed results of how students perceive peer respect could create a question as to what students are genuinely feeling about friends and should communicate to school personnel that the dynamics of peer relationships should gain attention for community building and development of a positive school culture. Results for gender differences at the fifth-grade level might indicate that the relationship between male students and the staff decreases as male students get older. While female students continue to identify a strong regard for the staff, male students do not, which could be influencing their overall feeling of belonging. While results did not directly identify a positive connection among academic achievement, gender, and school belonging, results did indicate that, during later years of elementary students' career, relationships between adults and peers begin to change. This change with relationships does have an impact on how students feel connected to the overall community of learners. School personnel should take heed and identify ways to connect students intentionally and authentically with students and adults throughout their school career.
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Appendices

Appendix A: Fall Student Survey

	1	
Item Number	Question	Possible Responses
1	I am treated fairly at my school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
2	I feel safe at school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
3	I have learning goals and my teachers help me track my progress	Strongly Disagree, Disagree, Neutral Agree, Strongly Disagree
4	I learn a lot in this school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
5	I like going to this school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
6	If a student has a problem, there are teachers who will listen and help.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
7	If I do well in school, it will help me when I grow up.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
8	My school is meeting my needs as a student.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
9	My teachers are good teachers.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
10	My teachers make clear what I am supposed to learn.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
11	My teachers make learning interesting.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
12	My teachers think I can learn.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
13	Teachers connect what students are learning with the real world.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
14	Teachers in my school really care	Strongly Disagree, Disagree, Neutral Agree Strongly Disagree
15	Teachers treats me with respect.	Strongly Disagree, Disagree, Neutral Agree, Strongly Disagree
16	I have internet access at home.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
17	I use technology at school to support my learning.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
18	I feel safe on the bus.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
19	The workers in the cafeteria are friendly.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
20	There is a feeling of belonging at my school.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree
21	Students in this school respect differences in other students.	Strongly Disagree, Disagree, Neutral, Agree, Strongly Disagree

22	In my school, there are clear rules again	Strongly Disagree, Disagree,
	hurting other people.	Neutral, Agree, Strongly Disagree
23	I have been insulted, teased, harassed, or	Strongly Disagree, Disagree,
	otherwise verbally abused more than	Neutral, Agree, Strongly Disagree
	once in this school.	
24	My teachers help me.	Strongly Disagree, Disagree,
		Neutral, Agree, Strongly Disagree
25	How much have you learned from your	Almost Nothing, A Little Bit,
	teachers?	Some, Quite a Bit, A Tremendous
		Amount
26	How clearly do your teachers present the	Not At All Clearly, Slightly
	information that you need to learn?	Clearly, Somewhat Clearly, Quite
		Clearly, Extremely Clearly
27	How interesting do your teachers make	Not At All Interesting, Slightly
	what you are learning in class?	Interesting, Somewhat Interesting,
		Quite Interesting, Extremely
		Interesting
28	How good are your teachers at helping	Not Good At All, A Little Bit
	you learn?	Good, Somewhat Good, Quite
• •		Good, Extremely Good
29	How fair or unfair are the rules in this	Very Unfair, Somewhat Unfair,
	school?	Slightly Unfair, Neither Unfair Nor
		Fair, Slightly Fair, Somewhat Fair,
	··· · · · · · · · · · · · · · · · · ·	Very Fair
30	How excited are you about going to this	Not At All Excited, A Little
	school?	Excited, Somewhat Excited, Quite
21		Excited, Extremely Excited
31	How interested are you in your classes?	Not At All Interested, A Little Bit
		Interested, Somewhat Interested,
		Quite Interested, Extremely
20	Will an average to a change of the first and	Almost Never Orac in a While
32	when your teachers ask, how are	Almost Never, Once in a while,
	you?, now often do you feel that your	Sometimes, Otten, Almost Always
	teachers really want to know your	
22	If you had something on your mind how	Not At All Clearly A Little Bit
55	in you had something on your hind, now	Clearly, Somewhat Clearly, Ouite a
	vou?	Rit Clearly, Extremely Clearly
3/	you: Overall how much do you feel you	Do Not Belong, Balong a Little Pit
54	belong at your school?	Belong Somewhat Belong Quite a
	belong at your senoor:	Bit Completely Belong
35	How much respect do students at your	No Respect At All A Little Rit of
55	school show you?	Respect Some Respect Ouite a Rit
	School Show you.	of Respect A Great Deal of
		Respect
1		

36	How often are people disrespectful to	Almost Never, Once in a While,
	others at your school?	Sometimes, Frequently, Almost
		Always
37	If a student is bullied in school, how	Not Difficult At All, Slightly
	difficult is it for him or her to get help	Difficult, Somewhat Difficult,
	from an adult?	Quite Difficult, Extremely Difficult
38	Overall, how unsafe do you feel at your	Not At All Unsafe, Slightly Unsafe,
	school?	Somewhat Unsafe, Quite Unsafe,
		Extremely Unsafe
39	How often do you feel unsafe when you	Almost Never, Once in a While,
	are on your way to and from school?	Sometimes, Frequently, Almost
		Always

Figure A1. This figure summarizes the questions posed to students attending school in District XYZ for the Student Survey windows. The survey was completed by students attending third, fourth, and fifth grade. The items that are in bold font are survey items utilized in this study for identifying student perceptions of sense of belonging. Adapted from *Fall Student Survey*, by District XYZ, 2016.

Appendix B: 9 Scales from Advance Questionnaire Items

	Description	Survey Source
Scale		
School Leadership	Identifies the degree to which	Faculty Survey
	leadership is perceived as	
	effective in improving students	
	learning	
Parental Involvement	Identifies the degree to which	Faculty Survey
	parents are viewed as partners in	
	the education of their children	
Safe and Orderly	Identifies the degree to which	Faculty, Parent, and
Environment	the school environment is safe	Student Surveys
	and orderly	
School Climate	Identifies the degree to which all	Faculty, Parent and
	students feel respected and	Student Surveys
	valued	
Guaranteed and Viable	Identifies the degree to which	Faculty Survey
Curriculum	essential curriculum has been	
	identified in the district and the	
	degree to which students have	
	adequate opportunity to learn the	
	content	
Professional Development	Identifies the impact of	Faculty Survey
	professional development on	
	improving learning for all	
	students	
Community Capital	Identifies the level of	Faculty Survey
	commitment and support by the	
	community for the school	
Efficacy and Expectations	Identifies the degree to which	Parent and Student
	teachers and students believe	Surveys
	that they are capable of	
	impacting student achievement	
Classroom Management	Identifies the degree to which	Student Survey
	educational personnel establish	
	and enforce classroom	
	management processes that	
	enhance student learning	

Figure B1. The full AQ is used to gather feedback from staff, families, and students. This figure is a summary of the AQ scales and the stakeholder group completing the survey items associated with the items that measure each construct. Adapted from *A Study of the Public Schools of Missouri*, by Preis, S., 2009. Retrieved from Joint Committee on Education website:

http://www.senate.mo.gov/jced/Public_School_Study.pdf

Appendix C: 10 Scales from Panorama Education Student Survey Development

Survey Scale	Description
Classroom Environment	This scale measures students' perceptions of the overall
	feel of classroom climate including the classroom's
	physical, social, and psychological environment
Engagement	This scale measures students' perceptions of their
	behavioral, cognitive, and affective investment in the
	subject and classroom
Grit	This scale measures a student's ability to persevere
	through setbacks to achieve important long-term goals
Learning Strategies	This scale measures the extent to which students
	deliberately use strategies to actively manage their own
	learning process
Mindset	This scale measures the extent to which students believe
	that they have the potential to change those factors that
	are central to their performance in a specific class
Pedagogical Effectiveness	This scale measures students' perceptions of a teacher's
	instructional methods and delivery of content
Rigorous Expectations	This scale measures students' perceptions of the extent to
	which their teacher holds them to high expectations
	around their effort, understanding, persistence, and
	performance in their class
School Belonging	This scale measures the extent to which students feel that
	they are valued members of their school's community
Teacher-Student	This scale measure students' perceptions of a teacher's
Relationship	care and support for their personal development and
	well-being beyond the classroom
Valuing of the Subject	This scale measures how interesting, important, and
	useful a student considers a specific subject

Figure C1. Questions contained in the student surveys developed by Panorama Education are developed around 10 scales identified as essential elements for effective teaching and learning in any classroom at any level. Adapted from *User Guide: Panorama Student Survey*, by H. Gehlbach, pp. 5-6, 2015a.

Appendix D: STAR Reading Skills and Domains

Domain	Skill Set	Skill
Word Knowledge and Skills	Vocabulary Strategies	 Use context clues Use structural analysis
	Vocabulary Knowledge	 Recognize and understand synonyms Recognize and understand homonyms and multi-meaning words Recognize connotation and denotation Understand idioms Understand analogies
Comprehension Strategies and Constructing Meaning	Reading Process Skills	 Make predictions Identify author's purpose Identify and understand text features Recognize an accurate summary of text
	Constructing Meaning	 Understand vocabulary in context Draw conclusions Identify and understand main ideas Identify details Extend meaning and form generalizations Identify and differentiate fact and opinion
	Organizational Structure	 Identify organizational structure Understand cause and effect Understand comparison and contrast Identify and understand sequence
Analyzing Literary Text	Literary Elements	 Identify and understand elements of plot Identify and understand setting Identify characters and understand characterization Identify and understand theme Identify the narrator and point of view
	Genre Characteristics	 Identify fiction and nonfiction, reality and fantasy Identify and understand characteristics of genres
Understanding Author's Craft	Author's Choices	 Understand figurative language Understand literary devices Identify sensory detail
Analyzing Argument and Evaluating Text	Anelysis	 Identify bias and analyze text for logical fallacies Identify and understand persuasion
	Evaluation	Evaluate reasoning and support Evaluate credibility

Figure D1. The STAR reading test developed by Renaissance Learning assesses students on 36 core skills organized within 5 domains of reading competencies. Adapted from *STAR Reading Technical Manual*, by Renaissance Learning, pp. 21, 2015.

Appendix E: Baker IRB Acceptance

Baker University Institutional Review Board

February 26th, 2021

Dear Rachel Ward and Harold Frye,

The Baker University IRB has reviewed your project application and approved this project under Exempt Status Review. As described, the project complies with all the requirements and policies established by the University for protection of human subjects in research. Unless renewed, approval lapses one year after approval date.

Please be aware of the following:

- 1. Any significant change in the research protocol as described should be reviewed by this Committee prior to altering the project.
- 2. Notify the IRB about any new investigators not named in original application.
- 3. When signed consent documents are required, the primary investigator must retain the signed consent documents of the research activity.
- 4. If this is a funded project, keep a copy of this approval letter with your proposal/grant file.
- 5. If the results of the research are used to prepare papers for publication or oral presentation at professional conferences, manuscripts or abstracts are requested for IRB as part of the project record.
- 6. If this project is not completed within a year, you must renew IRB approval.

If you have any questions, please contact me at <u>npoell@bakeru.edu</u> or 785.594.4582.

Sincerely,

Nathan D. Pay

Nathan Poell, MLS Chair, Baker University IRB

Baker University IRB Committee Sara Crump, PhD Nick Harris, MS Christa Manton, PhD Susan Rogers, PhD

Appendix F: Application to Conduct Research in District XYZ Proposal

	Research Checklist and Ap	proval
Date:1/1	3/21	
Submitted t	o: Director of Research, Evaluation & Assessment	
Submitted I	by:Rachel Ward	
Research F Student Ac	Proposal Title:_The Relationship Between Students hievement, and Gender at the Elementary Level	Sense of Belonging,
Principal In	vestigator(s):Rachel Ward	
Checklist		
Complet	ted "Application to Conduct Research in	
Copy of	"Informed consent" letter to study population/parent	s
Copies of	of measurement instruments	
🗆 Approva	I from university human subjects committee (IRB) if	applicable
Copy of	your complete application package	
Approval of in the docur provided wit to the inform withdraw ap interests of	this research is contingent on adherence to district ment entitled "Application to Conduct Research" and th the application. The district must be notified of ar nation contained in the application. The district rese proval of research if the research is deemed to no le the students, staff, or the district.	procedures as outlined the information by substantive change rves the right to onger be in the best
Research A	pplication: Approved Denied Date:	
Signatures		
	Director of Research, Evaluation, and Assessment	_
	Principal	_
	Principal	

Application to Conduct Research in

Name Rachel Ward	Organization	De Ac	epartment cademic Ser	vices
Address 6355 Brownridge Drive	City Shawn	e	State KS	Zip Code 66218
Phone Number 816-868-0289	Fax Number	E- wa	mail ardr@ chelward04@	Dhotmail.com

I have read and understand the process of application to conduct research in the

I also verify that the information provided in this application is accurate to the best of my-knowledge.

Signature Date

Is this study part of your work for a degree? X Yes Do If Yes, complete the following: Dh.D.X Ed.D. M.A./M.S Undergraduate Other University or College_Baker University Date of IRB Approval (or date of application if pending)_10/23/20_____ Advisor's Name_Dr. Harold Frye_____ Advisor's Telephone Number 913-344-1220

Attach a concise, yet thorough, response to each of the following items.

- Title and purpose of study
- 2) Timeline When do you plan to start your study? What is the estimated total length of time?
- 3) Benefits to the district
 - How will this study benefit the
- 4) Research Design Summary

Give specific information on the methods to be used during the course of the study. Please include your research questions, instruments, sampling and data collection methodologies, and proposed analyses. Samples of instruments may include survey questions, observation forms, and interview questions. Finally, describe any tasks students or staff will be asked to complete. Describe procedures you will use to secure and acknowledge informed consent of all participants, including active or passive consent. If passive, please provide a rationale. Please attach copies of any letters. Outline how subjects will be identified and criteria used for recruitment, who will make the initial contact with subjects, and whether or not inducements will be used to secure participation.

- 5) Assurance of anonymity of students & staff
- How will the anonymity of **Risks of the research Risks of the research**

List any known risks of the proposed investigation to students, staff, or the district.

7) District involvement

What request are you making of the **example** and the Director of Research, Evaluation, and Assessment? Specify numbers of students and staff to be involved, length of time, and time line for completion of your investigation.

8) Funding Sources

IRB approval

If applicable, give the date and copy of IRB approval letter, or application if IRB review is in process. will not allow study to begin until we have an approval letter on file.

1/13/2021

1) Title and purpose of study

Title: The Relationship Between Student Sense of Belonging, Student Achievement, and Gender at the Elementary Level

Purpose: The primary purpose of this study will be analyze the relationship between elementary students' perceptions of school belonging and academic achievement, with a secondary purpose of identifying perception variations of student sense of belonging between female and male students.

2) Timeline

The study would begin when archived data is available. Estimated total length of time would depend on time necessary to analyze archived data.

3) Benefits to the district

This study would benefit the by identifying if academic achievement has an influence on perception of belonging to the school environment and where differences may exist between genders.

4) Research Design Summary

Subjects in the study are third, fourth, and fifth grade students who attended school in the during the 2016-2017 school year.

Measures used in this study include archived STAR Reading data from the winter implementation and archived survey data from the Advanced Questionnaire from the 2016-2017 school year. Specific questions from the 2016-2017 AQ utilized for the study include:

Item Number	Question	Possible Responses
14	Teachers in my school really care about	Strongly Disagree, Disagree, Neutral,
	me.	Agree, Strongly Disagree
15	Teachers treats me with respect.	Strongly Disagree, Disagree, Neutral,
		Agree, Strongly Disagree
20	There is a feeling of belonging at my	Strongly Disagree, Disagree, Neutral,
	school.	Agree, Strongly Disagree
21	Students in this school respect	Strongly Disagree, Disagree, Neutral,
	differences in other students.	Agree, Strongly Disagree
34	Overall, how much do you feel you	Do Not Belong, Belong a Little Bit,
	belong at your school?	Belong Somewhat, Belong Quite a
		Bit, Completely Belong
35	How much respect do students at your	No Respect At All, A Little Bit of
	school show you?	Respect, Some Respect, Quite a Bit
		of Respect, A Great Deal of Respect

Research questions for the study include:

- To what extent is there a relationship between student achievement, as measured by STAR Reading scores, and elementary students' perceived sense of belonging?
- To what extent is there a difference in sense of belonging between male and female students?

Archived data will be used in this study. Students nor staff will be asked to complete any tasks for

this study. No consent will be needed from subjects because the data is archived data. Student identity will be kept anonymous throughout the study. Steps to ensure confidentiality will be a random number of assigned to each subject in the study with name appearing. No inducements will be offered to the subjects for participation.

5) Assurance of anonymity of students & staff

Student results from either measures utilized in the study will not be identifiable.

6) Risks of the research

Students, staff, nor the district will not encounter any risk from this proposed investigation.

7) District involvement

The request made of the District and Director is to allow archived data to be available for analysis. The only time demand for this study is retrieval time and access time of archived data requested.

8) Funding Sources

No funding sources would be necessary by this study.

IRB approval

IRB application was submitted to Baker University on 10/23/20.

1/13/2021

Appendix G: Application to Conduct Research in District XYZ Acceptance

The following is an email identifying the approval to conduct research.

Ward, Rachel

From: Sent: To: Subject:

Friday, January 15, 2021 2:54 PM Ward, Rachel RE: Application to Conduct Research

Rachel,

Your recent submission of a request to conduct research in the the second secon