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THE RELATIONSHIP OF TEACHER – PRINCIPAL TRUST AND STUDENT DEMOGRAPHICS ON HIGH SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS

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THE RELATIONSHIP OF TEACHER – PRINCIPAL TRUST AND STUDENT DEMOGRAPHICS ON HIGH SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS

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ABSTRACT

TTHE RELATIONSHIP OF TEACHER – PRINCIPAL TRUST AND STUDENT DEMOGRAPHICS ON HIGH SCHOOL STUDENTS' ACHIEVEMENT IN MATHEMATICS

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Although school principals are primarily held accountable for student achievement, they have only an indirect impact on that achievement (Darling-Hammond & Bransford, 2007; Hallinger & Heck, 1996; Supovitz, Sirinides, & May, 2010). Teachers affect student achievement directly, and principals affect teachers. Because faculty trust in the principal is one variable principal's affect in teachers that could have a positive impact on student achievement (Bryk & Schneider, 2002; Sweetland & Hoy, 2000; Tschannen-Moran, 2001), the challenge for principals is knowing what will impact their teachers' trust in them (Blake & MacNeil, 1998).

This study investigated relational trust and its influence on student achievement in mathematics. Research question 1 looked at whether student achievement in mathematics can be predicted based on teacher – principal trust and student demographics. Research question 2 looked to determine if a difference existed in student achievement in mathematics between the means of schools with high and low teacher – principal trust levels.

The findings in this study suggests that when trust exists in the relationship between the school principal and teachers, students experience greater achievement levels

in mathematics. This study aligns with Bryk and Schneider's Relational Theory of Trust and implies that when high levels of trust exists within the members in a school community, the consequences are positive and quite significant.

This study provides implications for school practitioners and leaders as the findings provide a basis for school improvements and closing the achievement gaps within marginalized student

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CHAPTER 1 INTRODUCTION

Although school principals are primarily held accountable for student achievement, they have only an indirect impact on that achievement (Darling-Hammond & Bransford, 2007; Hallinger & Heck, 1996; Supovitz, Sirinides, & May, 2010). Teachers affect student achievement directly, and principals affect teachers. Because faculty trust in the principal is one variable principal's affect in teachers that could have a positive impact on student achievement (Bryk & Schneider, 2002; Sweetland & Hoy, 2000; Tschannen-Moran, 2001), the challenge for principals is knowing what will impact their teachers' trust in them (Blake & MacNeil, 1998).

Accountability raises the question about what should be the priority for the principal's attention. Teacher - principal relationships vary greatly among schools and even among teachers at the same school. Furthermore, those relationships affect student achievement (Walsh, 2005). This phenomenon occurs because teachers who see principals as facilitators, supporters, and reinforcers for the jointly determined school mission rather than as guides, directors, and leaders of their own personal agenda are far more likely to feel personally accountable for student learning (McEwan, 2003). The principal occupies an important position in the school building. As the leader of a group of professional, certified teachers, and the coordinator of a cadre of classified personnel, the principal establishes important relationships with the staff (Drake, 1992).

Principals have the ability to improve teacher perceptions overall by simply attending to fundamental components inherent in quality relationships. As teachers begin to feel better about themselves and what their collective missions are as a result of

significant interactions with their principals, they become more effective in the classroom (Edgerson, D. E., Herrington, D., Kristsonis, W. A., 2006).

Purpose of the Study

The purpose of this non-experimental quantitative study was to investigate relational trust and its influence on student achievement in mathematics. For the purposes of this study, the research specifically looked at whether student achievement in mathematics can be predicted based on teacher – principal trust and student demographics (see Table 1) and to determine if a difference existed in student achievement in mathematics between the means of schools with high and low teacher – principal trust levels.

Table 1

Student Demographics and Abbreviations

Variable	Abbreviation
English language learner	ELL
Student with Disabilities	SWD
Economic Need	NEED

Theoretical Framework

School climate has been researched for many years and continues to be examined as an important element in educational outcomes. School climate consists of characteristics which comprise the total learning environment and has been referred to as the perceptions of the individuals in an organization (Owen, 2004). Hoy and Miskel (1996) and Tschannen-Moran and Hoy (1998) noted the school climate was a continuing quality of the school which was sensed by all members and influenced their attitudes,

behaviors, and perceptions. A positive school climate provided a stimulating and productive environment for learning which could aid in producing high student achievement and growth (Phi Delta Kappa, 1973).

Research has shown the climate of a school can have a positive influence on social, educational, and psychological outcomes for students, or school climate can be detrimental to student achievement and social development (Freiberg 1998; Johnson & Johnson 1993; Kuperminc et al., 2001; Manning & Saddlemire, 1996; Owen, 2004). Six elements of school climate have been identified by researchers including: number and quality of interactions between students and adults; perceptions of the school environment; academic performance; feelings of safety; school size; feelings of trust; cohesiveness; opportunity for input; and school renewal and growth (Kuperminc et al., 2001; Johnson, Johnson, & Zimmerman, 1996; Johnson & Johnson, 1993; Frieberg, 1998; Manning & Saddlemire, 1996; Howard, 1985).

School climate was noted to have a positive effect on the learning environment or to be a significant barrier to learning. A high level of trust within the school climate was the key to transforming a learning environment which fostered high student achievement (Goddard, Tschannen-Moran, & Hoy 2001; Frieberg, 1998; Tschannen-Moran, 2004). All actors in an organization were responsible for creating an atmosphere of trust, but the campus principal had the primary responsibility (Greenleaf, 1977). Within the school, an atmosphere of trust, as created by the principal, would move outward with the effect of positive gain in student achievement due to increased collaboration and risk-taking behaviors (Saphier & King, 1985; Seidman, 2007).

Studies have shown when little trust existed within schools, student proficiency in learning decreased because students devoted their energy to calculating ways to protect themselves instead of engaging in learning (Bryk & Schneider, 2003; Tschannen-Moran, 2004). When mistrust prevailed, there was disengagement from the educational process because safety was a priority to the students above academic achievement. Psychological safety was found to support learning; therefore, schools with high trust levels were more likely to demonstrate improvements in student learning (Bryk & Schneider, 2003; Cosner, 2009; Tschannen-Moran 2004).

This study was based on a theoretical framework linking the Five Essential Supports for School Improvement as defined by Anthony Byrk and Barbara Schneider. Students' academic learning occurs principally in classrooms as students interact with teachers around subject matter (Bryk & Schneider, 2002). The Framework for Great Schools was implemented from the research conducted by Bryk and Schneider (2002), to provide educators with a valuable way to structure the essential elements of school improvement.

Figure 1 presents the conceptual framework used to support a large urban school district in identifying and strengthening connections between the elements of the Framework for Great Schools and current practices aligned to measures of performance and growth. Table 2 presents the conceptual framework elements, definitions and measures for predicting growth.

According to Bryk & Schneider (2002), schools in which student learning improves have coherent instructional guidance systems that articulate how teachers differentiate content, manage the learning environment, and use ongoing assessment and

flexible grouping to improve instruction. Coordinated with this are the materials, tools, and instructional routines shared across a faculty that scaffolds instruction. However, schooling is a human resource-intensive enterprise. Schools are only as good as the quality of the faculty, the professional development that supports their learning, and the faculty's capacity to work together to improve instruction. Bryk and Schneider (2002) also stated that "trust does not directly affect academic performance, but fosters organizational conditions, which in turn promote activities that do directly affect learning" (p. 34). This theory was developed as a conclusion to their ten-year, mixed method, longitudinal study which focused on school improvement. The concept of trust was derived as an answer to why some schools embraced change while others remained ineffectual.

Figure 1

Conceptual Framework for Great Schools

Note. The Framework for Great Schools was adopted by a large, urban school district and used annually to assess school performance.

Table 2

Elements, Definitions, and Measures for Predicting Growth

Element	Definition	Measures
Rigorous Instruction	Instruction is customized, inclusive, motivating, and aligned to the Common Core; high standards are set in every classroom; students are actively engaged in ambitious intellectual activity and developing critical thinking skills	Academic press; Literacy and Math instruction; Course clarity; Quality of student discussion
Collaborative Teachers	Teachers are committed to the success and improvement of their classrooms and schools; they have the opportunity to participate in professional development within a culture of respect and continuous improvement	Cultural awareness and Classroom instruction; Innovation and collective responsibility; Peer collaboration; Quality of professional development; school commitment
Supportive Environment	The school establishes a classroom and school culture where students feel safe, supported, and challenged by their teachers and peers	Classroom behavior; Guidance; Peer support for academic work; Personal attention; Safety; Social emotional; Preventing bullying
Strong Family- Community Ties	School leadership brings resources from the community into the school building by welcoming, encouraging, and developing partnerships with families, businesses, and community-based organizations	Outreach to parents; Parent involvement in school
Effective School Leadership	Principals lead by example and nurture the professional growth of teachers and staff, developing and delivering the instructional and social-emotional support that drives student achievement	Inclusive leadership; Instructional leadership; Program coherence; Teacher influence
Trust	Everyone works toward the shared goal of improving student outcomes, preparing students for success in school and beyond; across the school community, there is respect; school staff, parents, students and administrators value each other	Parent-principal trust; Parent-teacher trust; Student-teacher trust; Teacher-principal trust; Teacher-teacher trust

Note. Detailed information about The Framework for Great Schools, its elements, definitions, and measures for predicting growth.

Leadership could be considered the single most important aspect of effective school reform (Marzano, 2003). Principals in improving schools engage in a dynamic interplay of instructional and inclusive facilitative leadership. On the instructional side, school leaders influence local activity around core instructional programs, supplemental academic and social supports, and the hiring and development of staff. Principals build relationships across the school community. Improving teaching and learning places demands on these relationships. School leaders advance instructional objectives while also trying to enlist teachers in the change efforts of improving the educational mission, organizational structure, academic programs, teaching methods, and community relationships. In this process, principals cultivate a growing cadre of leaders such as teachers, parents, and community members who can help expand the support of this work and share overall responsibility for improvement (Bryk & Schneider, 2002).

Building trust with teachers has been demonstrated as a key competence that a principal should have to create an environment, in which effective instructional leadership is fostered and distributed (Blase & Blase, 2000). The leadership team operates best by ensuring that the views and concerns of all members of the school faculty are represented in its deliberations (Marzano, 2003). Wahlstrom and Louis (2008) describe that instructional leaders should be involved in the instructional work of teachers. This involves creating a sense of trust with teachers to discuss instructional issues during formal and informal supervision and sharing responsibility with others in the school building because a principal cannot be everywhere at one time.

As social interactions occur, individuals simultaneously observe the behavior of others, pay attention to the processes being deployed to maintain a desired outcome,

determine how they personally feel about these interactions, and question their beliefs about the underlying intentions that motivated the other party to act. Relational trust as defined by Bryk & Schneider (2002), diminishes when people perceive that others are not behaving in a manner that is consistent with their role obligations. Furthermore, fulfillment obligations are not just doing what is expected and right, but also doing it in a manner that is reverent and performing for the right reasons (Bryk & Schneider, 2002).

Applying Relational Trust Theory to schools, Bryk and Schneider (2002) saw social exchanges of schooling as situated around a distinct set of role relationships among principals, teachers, parents, and students where parties in a role relationship understand their position and have expectations of the roles of the other parties. In addition, maintenance, and growth of relational trust in any given role set embodies harmony in mutual expectations and obligations (Bryk & Schneider, 2002). Their interpretation of relational trust theorizes that schools work well when this synchrony is achieved. The concept of trust was derived as an answer to why some schools seemingly embraced change while others remained ineffectual. Social exchanges that make up daily life in a school community fuse into distinct social patterns that can generate organization-wide resources needed for learning. According to Bryk & Schneider (2002), these social exchanges lead to teacher buy-in (a crucial ingredient for reform), and reduces the sense of risk associated with change. When school professionals trust one another and sense support from parents, they feel safe to experiment with new practices. The absence of trust can provoke sustained controversy and hinder the resolution of simple problems. A school with a low score on relational trust had only a one-in-seven chance of demonstrating improved academic productivity. Most significant was the finding that

schools with chronically weak trust had virtually no chance of improving in either reading or mathematics. Understanding the impact of trust in the educational setting has great potential for improving the overall educational experience for all stakeholders.

Significance of the Study

Not only have state and federal mandates pressured schools to improve, but school leaders could face sanctions if certain criteria were not met. The responsibility for leading school reform efforts was placed primarily on the campus principals who were being called upon

to transform the school they served into learning organizations characterized by collaborative teams which incorporated teacher leadership, used results-based instructional practices, and data driven decision-making (Saphier & King, 1985). Ultimately, school leaders were expected to lead in the development of a school climate conducive to continuous improvement and academic success for all students (Lieberman, Saxl, & Miles, 2000).

This study would further contribute to the research that looks at how the theory of relational trust in schools can impact school and its students' achievement.

Connection with Social Justice in Education and Vincentian Mission in Education

Research studies have indicated that trust in schools can have a positive impact on school improvement and reform. According to Goddard, Tschannen-Moran, and Hoy (2007) trust makes schools better places for students to learn, teachers to teach and administrators to manage. They reveal a positive relationship between trust and school outcomes (Tschannen-Moran, 2004b). Bryk and Schneider (2003) indicate that trust does not guarantee success alone. However, schools have no or little chance to improve when

there is no trust there. This research brings into focus the value of a trusting relationship between teachers and school administrators and its impact on student achievement, especially in urban education where there are greater rates of students demographics such as ELLs, SWDs and NEED. All of which are out of the control of school staff.

> St. John's is a Vincentian university, which strives to provide an excellent education for all people, especially those lacking economic, physical, or social advantages. Wherever possible, we devote our intellectual and physical resources to search out the causes of poverty and social injustice and to encourage solutions that are adaptable, effective, and concrete" (St. John's University, n.d.)

As an alumnus of St. John's University, it is my hope that this research study will encourage further solutions that are adaptive, effective and concreate, ultimately creating a positive impact on student achievement and school reform.

Research Design and Research Questions

This non-experimental quantitative study used archival data. The data was acquired from the New York State Education Department (NYSED) and the NYCDOE public data files through the internet. Hierarchal multiple regression and independent samples t-test were statistical analyses techniques used in the study. Two research questions below guided this study:

1. To what extent do teacher – principal trust, % ELLs, % SWDs, % NEED predict student achievement in mathematics?

2. Is there a significant difference in student achievement in mathematics between schools of high and low teacher-principal trust levels?

Definition of Terms

Trust: One of the six elements of The Framework for Great Schools. Trust looks at whether relationships between administrators, educators, students, and families are based on trust and respect. Levels of trust on the NYC School Survey assess five areas of trusting relationships: Parent-principal trust, Parent-teacher trust, Student-teacher trust, Teacher-principal trust, and Teacher-teacher trust. For this research study, the total Trust element score will be used as the teacher-principal trust variable (Framework & School Survey Scoring Technical Guide, 2018).

Student Achievement: End-of-year New York State Assessment in Algebra I Common Core after students have completed the year – long course curriculum. Results of this assessment are used by New York's state and local education agencies to measure school performance and yearly growth. The metric value of student achievement in mathematics is defined as the average school score on the June 2018 Algebra I Common Core Regents exam.

CHAPTER 2 REVIEW OF THE LITERATURE

This literature review examined the basic concepts and definitions of trust and how they are related to educational settings. Additionally, this review details how Bryk and Schneider (2002) first derived that the concept of trust had an impact on schools. Last, this literature review examined prior research studies conducted on trust, as well as professional relationships that exist between teachers, principals, and educational institutions.

Theoretical Framework

Bryk and Schneider's Relational Theory of Trust provides much of the theoretical framework for this study. In Trust in Schools: A Core Resource for Improvement, Bryk and Schneider (2002) discussed the findings of the first longitudinal study regarding the importance of trust in a public-school setting. The Relational Theory of Trust, the first specialized trust theory related to schools as organizations, was born from this research. The researchers summarize,

> "Insights from a diverse array of fields, including philosophy, political science, economics, and organizational behavior, helped us to construct a grounded theory of social trust in school communities. Through a combination of literature analysis and field note review, we developed an explicit focus on the distinctive qualities of interpersonal social exchanges in school communities, and how these cumulate in an organizational property that we term relational trust" (Bryk et al., 2002, p. 12).

Their mixed methods study originally began with the intent to explain differences in school improvement and capacity in hopes of improving the Chicago Public Schools over

a 10-year period. Bryk and Schneider (2003) developed their theory from longitudinal case studies in 12 Chicago elementary schools following the 1988 Chicago School Reform Act. The field observations and case studies were used in conjunction with clinical observations from those studying the effects of the reform act in the Chicago Public Schools (Bryk et al., 2002). Additionally, the researchers used large-scale quantitative data assembled by the Consortium on Chicago School Reform. Bryk and Schneider (2003) discussed how the practice-based observations of the Center for School Improvement and the archived data assembled by the Consortium created an unparalleled set of information resources for research on urban school reform. The concept of trust was derived as an answer to why some schools seemingly embraced change and others remained ineffectual (Bryk et al., 2002).

Bryk and Schneider stated: "Trust does not directly affect academic performance, but fosters organizational conditions, which in turn promote activities that do directly affect learning" (2002, p. 34). The Theory of Relational Trust is specific to the educational setting. To better understand the impact of relational trust on schools, it is important to differentiate it from other kinds of trust found in varied settings.

A different study, completed by Gail D. Scarr (2011), found that teachers and staff have better working relationships with principals who exhibit leadership characteristics of openness and collaboration. The faculty/staff felt like they were part of a team that all centered on the same goals and visions of the school. Authoritative styles of leadership resulted in lower levels of trust and general concern on issues of trust in the workplace.

The primary purpose of Scarr's (2011) study was to seek teacher perceptions of

trust with their principal. The research questions focused on three areas, including how teachers perceive issues of trust between themselves and their principal, how teachers perceive trust as it relates to open and honest communication with their principal, and how teachers perceive trust as it relates to the power dynamics and working relationship with their principal. The target population consisted of 10 general education elementary teachers who volunteered to talk openly about their perceptions of trust, communication, and working relationships with their building principal. A two-part interview protocols was used to guide the conversations and the interviews were transcribed verbatim. A thorough and extensive analysis of the data revealed patterns and themes related to the various components of trust (Scarr, 2011).

The research participants provided useful data regarding perceptions of trust between themselves and their principals. To summarize the data, the teacher/participants indicated that the higher their perception of trust was with their principal, the more open and honest their working relationship was. Conversely, the lower their perception of trust was, the less open and honest the working relationship was (Scarr, 2011).

Trust Related Research

Defining Trust

Organizational trust and its impact on the business world has been studied for decades; however, the focus on trust within schools began in the early 1980's (Kochanek, 2005). Hoy, Forsyth, and Adams (2011) began defining trust in those early years based on group relationships within schools. Since then, they have been refining their definition based on their own work and the work of other researchers. Hoy and Tschannen-Moran (1999) derived their widely-accepted definition of trust from compiling the research of 16

studies regarding the impact of trust in schools. They currently define trust as "an individual's or group's willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest, and open" (Hoy and Tschannen-Moran, 1999, p. 189). Tschannen-Moran (2004) further discussed that trust is a multifaceted construct and that there are many elements for drivers of an overall level of trust. Depending on the context of the trust relationship, trust can vary somewhat. It can also change over the course of a relationship, as expectations are either fulfilled or disappointed and as the nature of the interdependence between two people changes.

In their historical review of scholarly definitions of trust, Tschannen-Moran and Hoy (1999) found a common thread: either explicitly or implicitly, the concept of vulnerability must be present in the trust relationship.

Within the many definitions throughout the trust literature, there are many variations on the terminology and descriptors used to reference the nature upon which one considers a trustee to be trustworthy (Tschannen-Moran, 2004). In Tschannen-Moran's (2004) definition, these conditions are benevolence, honesty, openness, reliability, and competence. In Bryk and Schneider's (2002) definition of trust, the four factors that are weighed in one's judgment when deciding to trust another individual are respect, competence, personal regard for others, and integrity a deficiency in any of the four considerations can undermine a discernment of trust in a relationship (Kochanek, 2005).

Within the literature on definitions of trust, there are three elements that have remained consistent over time: trust is a psychological state, vulnerability is a necessary component of trust, and a discernment of the intentions of others is a fundamental feature

of trust (Bryk, Schneider, & Russell Sage Foundation, 2002; Kochanek, 2005; Tschannen-Moran, 2004).

Organic Trust

Organic trust exists in environments that support unquestioning beliefs of individuals in areas of moral authority (Bryk and Schneider, 2003): "In such social systems, individuals give their trust unconditionally; they believe in the rightness of the system, the moral character of its leadership, and all others who commit to the community" (Bryk and Schneider, 2002, p. 16). Organic trust is key to institutions such as fundamentalist religious schools. Schools in these communities are an integral part of the day-to-day total institution in which complete obedience is demanded (Bryk and Schneider, 2002).

Bryk and Schneider (2002) pointed out that organic trust is difficult to maintain in most settings. There are few core beliefs that all members of a group can be assumed to share and follow without question. As a condition for participation, the skill of a modem institution to encourage consent is also typically limited (Bryk and Schneider, 2002). The researchers also suggest that organic trust is especially difficult to maintain in American educational settings where such a high value is placed on freedom and individual choice (Bryk and Schneider, 2002).

Contractual Trust

In contrast to organic trust, contractual trust is much more common in modem settings. A contract defines basic actions by both parties involved in the relationship. Much of modem social life including virtually all commercial transactions, are shaped at least implicitly by this form of trust. Terms of work to be performed, services to be

delivered or products to be purchased are explicitly identified with a detailed scope of expectations (Bryk et al., 2002). Individuals and institutions are more constrained in their relations with one another when working in the boundaries of contractual trust. However, within this type of relationship it is often easy to determine if the parties have acted within the terms of the agreement. If one party does not uphold an agreement, then the other party can seek redress through legal actions (Bryk et al., 2002).

Contractual trust, while appropriate for most business practices, does not apply to educational settings for many reasons. Primarily, the goal of education cannot be summed up into a single product, good, or service. The many aims of education are interrelated and the outcomes are dynamic and evolving. Many of the desired outcomes of schooling, which might form the basis of a contract, cannot be easily attained (Bryk & Schneider, 2003).

Relational Theory of Trust

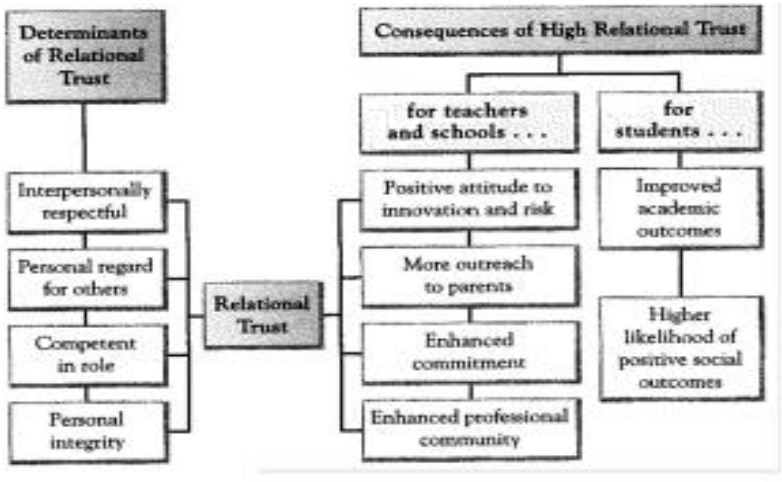
Neither organic nor contractual trust can capture the complex web of social exchanges that occur daily in a school (Bryk et al., 2002). Bryk and Schneider theorize that "relational trust represents an intermediate case between the material and instrumental exchanges at work in contractual trust and the unquestioning beliefs operative in organic trust" (2002, p. 21). Unlike in contractual trust, violations of relational trust is not easily subject to legal redress. However, loss of trust in a school setting can be detrimental, as it can lead to a weakening of relationships.

In a school setting, there are distinct sets of relationships: teacher/student, teacher/colleague, teacher/parent, teacher/principal, and principal/colleague.

Within each of these relationships, there are expected role obligations. Figure 2 shows the consequences of high relationship trust for teachers, students, and school are quite significant. “Relational Trust as a Social Resource for School Improvement,” (Bryk et al., 2002, p. 130) there must be forces and elements that coexist. Schools work well as organizations when this synchrony is achieved within all of the major role sets that comprise a school community (Bryk et al., 2002).

Figure 2

Consequences of High Relational Trust in Schools



Bryk and Schneider (2002) propose that individuals draw upon a dynamic interplay of four considerations when observing and interpreting the behavior of others: respect, competence, personal regard for others, and integrity. The researchers warn that a serious deficiency in any one of the criterions can ruin the trust relationship (Bryk et al., 2002).

The first discernment criterion is respect. Respect is “a basic regard for the dignity and worth of others” (Kochanek, 2005, p. 7). In trusting relationships, respect is seen when people listen to what others say and they respond by taking their opinions into

account in future actions (Bryk et al., 2002). It is important to note that respect is pivotal to school improvement, because the presence of respect is especially critical when people disagree Individuals can still feel valued if others respect their opinions (Bryk & Schneider, 2003).

The second discernment criterion, competence, is defined as one's ability to carry out the formal responsibilities of the role (Kochanek, 2005, p. 8). Relational trust can exist under a broad spectrum of how well each individual actually carries out his or her role. Bryk and Schneider (2002) assert, "Gross incompetence, however, is corrosive to trust relations. Allowed to persist in a school community, incompetence will undermine collective efforts toward improvement" (p. 25).

The third criterion for discernment in the foundation of relational trust is personal regard, or any actions interpreted as an expression of benevolent intentions (Bryk et al., 2002). This involves behaving in ways that allow others to perceive that you care about them. This shows that you are willing to extend yourself beyond what your formal role might require in any given situation (Bryk et al., 2002). This type of behavior can reduce another person's feelings of dependency and vulnerability, which in turn can increase feelings of interpersonal trust (Bryk et al., 2002).

The final discernment criterion is integrity, the reciprocal feeling that both parties will keep their word and be honest and ethical in their actions (Bryk et al., 2002). Bryk and Schneider (2003) think of individuals as having integrity if there is consistency between what they say and what they do.

Schools are public institutions guided by numerous sets of competing individual interests that frequently cause conflicts to arise in the development of considering what is

ethical and right. “In adjudicating these disputes, integrity demands resolutions that reaffirm the primary principles of the institution. In the context of schooling, when all is said and done, actions must be understood as about advancing the best interests of children” (Bryk et al., 2002, p. 32).

Trust as a Factor in Achievement

The relationship between trust and achievement has been assessed to find factors in linking academic achievement, socioeconomic status (SES), and racial composition were mediated by the levels of trust that teachers reported in students and parents (Goddard, Salloum, and Berebitsky, 2009). Schools were systematically randomly selected and stratified by location, prior achievement, SES, and size to represent all traditional public elementary schools across Michigan. From the eligible population, a sample of 150 schools was selected. Surveys were completed from 80 schools out of 130 (62%). Teachers responded to surveys measuring the levels of trust in schools.

To facilitate interpretation of the results, all variables used in the analyses were standardized ($M = 0$, $SD = 1$). Because the hypothesized conceptual model involved several structural relationships, the researchers used path analysis as the primary analytic method. The 14-item scale used to measure trust was consistent with the conceptual framework of Bryk, Schneider (2002) and Baier (1986). There was also a subset of items used by Goddard (2009). Teachers responded to each item on a 5-point, Likert-type scale. Using path analysis and controlling for measures of school context, greater trust was associated with increased school achievement in mathematics and reading on state assessments used for accountability purposes.

The predictive nature of trust and leadership on the perceptions of threat-rigidity

from educators in performance improvement and non-performance improvement schools was conducted by Daly (2009). A sample of 353 teachers in fourteen schools over in two different years and was drawn from four districts in southern and central California. Fifty-three site administrators who work in performance improvement settings were chosen to round out the survey phase.

Teachers and site administrators were surveyed in four districts representing eight schools in performance improvement and six schools in non-performance improvement, to test the hypothesis that the multifaceted construct of trust and leadership has a predictive relationship with threat-rigid response. Threat-rigidity can be defined as: "Individuals in organizations or communities that are under perceived threat often experience a collective response that may limit flexibility in problem solving and so reduce productive interaction" (Daly, 2009, p. 180).

Findings of multiple linear regression models, focus groups, and interviews indicated the presence of trust and leadership approaches that were participative and inclusive. They predicted lower levels of threat-rigid response by teachers and administrators in performance improvement schools.

Bozman (2011) confirmed previous findings by Tschannen-Moran (1999), Hoy (2011), and Goddard (2009) concerning the positive effect that efficacious beliefs and trust have on student success and also showed a strong correlation between the principal's leadership style and the teachers' trust in the principal. This study was conducted in both urban and rural school systems located in the southeastern portion of the United States. There was a total participant population of more than 71,000 students. In the three school systems, there were 1085 teachers who received surveys in fourteen

public high schools. The purpose of his study was to determine the effects that individual teacher efficacy, collective teacher efficacy, teachers' trust in the principal, and the principals' leadership behavioral style has on student achievement.

Bozman (2011) developed a request packet for the teachers at the three participating school districts, which contained the four surveys that each participant would complete. Surveys were completed anonymously. However, it was noted which school the participant was from for correlation studies. There were 11 null hypotheses researched in this study. To gather data for the study, four measurement instruments for each school were used: (1) The Principal's Leadership Behavioral Scale, developed by the researcher (2) The Teachers' Trust in the Principal Scale also developed by the researcher; (3) the Teachers' Sense of Efficacy Scale developed by Tschannen-Moran (2001); and (4) the Collective Teacher Efficacy Scale (CTES) developed by Goddard, Hoy, and Hoy (2000). Analyses included: descriptive statistics, inferential statistics by way of correlation and simple linear regressions. Even with the prior mentioned confirmations, further empirical research was needed to see if there was any relationship between the principals' leadership style, the teachers' trust in the principal, and student achievement.

Trust and Instructional Improvement

A study by Robert Smalt (1997) focused on developing valid and reliable instruments that could be used to measure a principal's styles of supervision. The purpose of this study was due to the ever-changing climate of education, and principals needed tools to measure leadership styles that were based on current literature and research. Smalt used appropriate models of supervision that supported the then new

curriculums and standards. Through use of BARS (Behavioral Anchored Rating scales) methodology, two instruments were developed from this study (Smalt, 1997). The Principals' Analysis of Supervisory Styles (PASS) and the Teachers' Analysis of their Principals' Supervisory Styles (TAPSS) were developed. However, it was recommended that the teacher's instrument needed further study involving discriminant validity (Smalt, 1997).

Smalt's (1997) instruments were created in conjunction with a jury of experts. These experts helped to verify that the instruments contained content-related validity. Data from a factor analysis, internal consistency coefficients, and the t-test of independent samples were analyzed and ensured content and construct validity (Smalt, 1997). A pilot study was then conducted to further analyze the validity of the two instruments. Internal consistency of the two instruments and their subscales was then determined by calculating Cronbach's alpha coefficients. The principals' instrument had an internal consistency of .9508 and the teacher's internal consistency was .9754, which both satisfied the requirements (Smalt, 1997). After final revisions were made, a field test was conducted with 55 teachers and 51 principals. There was a control group and an experimental group for each. Through a t-test of independent samples, construct validity was determined with different statistical differences at the .005 level between groups (Smalt, 1997).

Smalt's (1997) study developed instruments that allowed educational researchers to examine principals' styles of supervision in a more scientific manner to ultimately improve schools. Principals could now make plans and analyze relationships/behaviors from the statistical data the instruments yielded. From this data, they could make better-

informed decisions and cater professionally to specific needs of their respective building.

Smalt's (1997) instruments were used in a study by Ginsberg (2003) to examine the perceptions of school teachers on the existence and importance of specific classroom observation practices. More than 300 elementary school teachers were participants in this study. Ginsberg (2003) modified Smalt's (1997) instrument in order to gather the necessary data. For consistency of terminology purposes, Ginsberg modified the survey by changing the word "principal" to "observer," as not all observations are completed by a principal but can be conducted by a chairperson or director of curriculum.

This study focused on four domains: purpose, professional trust, reflective thinking, and instructional improvement. Results from this investigation indicated that while teachers identified all four domains as important in the observation process, the actual existence of these domains was significantly lower on the actual observational tools used by their supervisors. Additionally, this study revealed that teachers were interested in being part of the observation process to further nurture their professional growth.

Card (2006) replicated Ginsberg's (2003) study, but used secondary teachers as the participants. Through use of Ginsberg's (2003) modified instrument, originally developed by Smalt in 1997, teachers' attitudes regarding classroom observation practices were analyzed on four dimensions: instructional improvement, purpose, professional trust, and reflective thinking. A total of 165 secondary teachers served as the participants. They were members of five districts, located in Suffolk and Nassau counties in Long Island, New York (Card, 2006). A major finding of this study indicated that "professional trust, reflective thinking and purpose were the most significant

predictors regarding observation practices that lead to instructional improvement" (Card, 2006, p. 121). Card's results were similar to Ginsberg's (2003), where although teachers and administrators agreed on many education-based decisions and practices that should take place during observations, there were significantly differing views on whether these practices actually existed during the observation process.

Romano (2016) conducted a study built upon previous research by Ginsberg (2003) and Card (2006). Romano identified key components of a classroom observation process that promotes instructional growth and development. Faculty participants, ranging from grade 7 - 12 had an assortment of 263 grades from one high school district in Nassau County. A 38-question survey based on the experience of a specific behavior and how it would help improve teacher performance was administered to teachers and supervisor alike.

Romano (2016) used *t*-tests to reveal a significant difference for both teachers and supervisors in that the mean for the existing practice was lower than the mean for the importance of practice on all dimensions, except for Supervisor-Professional Trust. Professional trust was believed to exist and to be important by supervisors in their current observation process. Romano (2016) concluded, "Both teachers and supervisors view professional trust as an important behavior of the classroom observation process as it relates to the improvement of teacher effectiveness" (p. 85).

New York State Assessment History

The first New State Assessments date back to 1865 (NYSED, 2015). These assessments were Regents exams that were used as high school entrance exams. Twelve years later Regents began being used as end-of-course exams. However, it was not until

1966 that assessments in reading and mathematics were administered to elementary students. The Pupil Evaluation Program (PEP) Tests were given to students in grades 3, 6, and 9 (NYSED, 2015). Figure 3 demonstrates a more detailed account of the timeline of the New York State Assessments.

According to NYSED (2015), in 1999, the first administration of the Grade 4 and Grade 8 Tests in English Language Arts and Math were conducted. The 1999 version of these assessments, through years of revisions, including the No Child Left Behind Act, Race to the Top, and Common Core Learning Standards, evolved into the more current New York Common Core Assessments which assess students from grades three through eight (NYSED, 2015).

New York State Common Core Assessments

Students enrolled in public, nonpublic, and charter schools across New York State are required to take assessments in English Language Arts and Mathematics each year. State assessments are created and used to measure the extent to which individual students achieve the New York State Learning Standards in particular subjects. All State exams are developed in accordance with national industry and professional standards for educational testing (NYSED, 2015). In order to assess the skills and knowledge set forth in the New York State Common Core Learning Standards (CCLS) the exams are carefully constructed.

New York State has an established Test Development Process to ensure content validity for its assessments. The process begins with reviewing the New York Common Core Learning Standards and designing test specifications.

Figure 3

Timeline & History of New York State Assessments

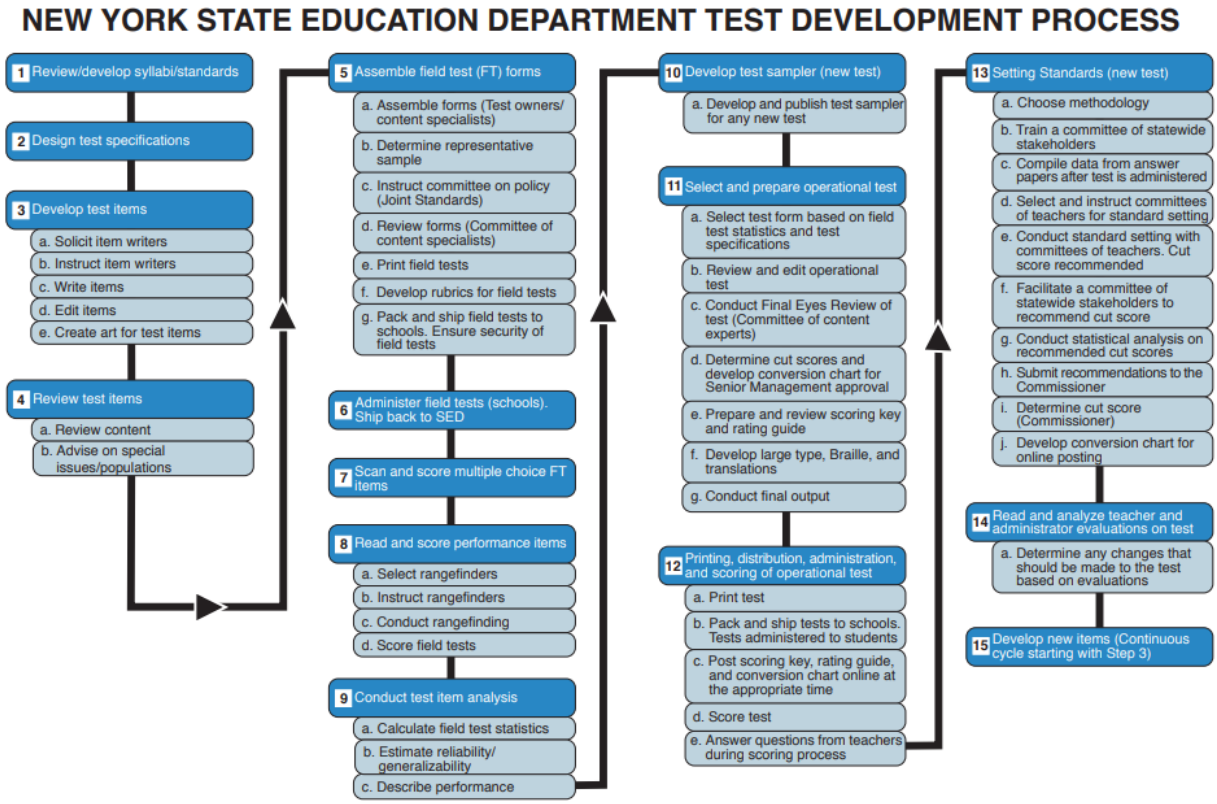
Timeline & History of New York State Assessments	
Year	Event
1865	First administration of Regents Exams as high school entrance exams
1878	First administration of Regents Exams as high school end-of-course exams
1966	First administration of the Grades 3.6. and 9 Pupil Evaluation Program (PEP) Tests in Reading and Mathematics
1979	Fast administration of Regents Competency Tests (RCT)
1983	First administration of the Grade 5 Writing Test
1989	Fast administration of the Program Evaluation Test (PET) in Science, Grade 4
1999	First administration of the Grade 4 and Grade 8 Tests in ELA and Math
2000	First administration of the New York State Alternate Assessment (NYSAA)
2001	First administration of the Grade 8 Intermediate-Level Science Test
2002	No Child Left Behind Act goes into effect
2003	First administration of the New York State English as a Second Language Achievement Test (NYSESLAT)
2004	First administration of the Grade 4 Elementary-Level Science Test
2006	First administration of the Grades 3-6 Tests in ELA and Math
2013	First administration of the Grades 3-8 Tests in ELA and Math aligned to Common Core
2014	First administration of Regents Exams in ELA (Common Core) and Algebra I (Common Core)
2015	First administration of Regents Exam in Geometry (Common Core) If adapted, first administration of PARCC tests
2016	First administration of Regents Exam in Algebra II (Common Core)

In order to develop test items, as evidenced in Figure 4, item writers need to be established, items need to be written, edited, and have created art for necessary items (NYSED, 2015). Upon review of the items, content, special issues, and populations are considered. Once items have been created they are field-tested. These items are then assessed using rubrics. Field tests are then administered, scanned, and scored along with selecting, instructing and conducting rangefinders. Based off of field tests statistics and test specifications the operational test forms are created. Once assessment forms are created a committee of content specialists conducts a final review. At this point, cut scores and conversion charts, along with scoring keys and rating guides, are created (NYSED, 2015). Tests are then administered to students under secure and uniform conditions across the state.

Once tests are scored, it is determined if any changes need to be made to the cut scores by a committee of statewide stakeholders along with a statistical analysis of data. Final recommendations are then made to the New York State Commissioner of Education pertaining to the change in cut scores. Once the commissioner makes the final decision, a conversion chart is developed for online posting. The last part of this process is the review of teacher and administrator evaluations of the test to determine any necessary future changes (NYSED, 2015).

Figure 4

New York State Education Department Test Development Process



Conclusion

According to Edgerson, D. E., Herrington, D., Kristsonis, W. A. (2006), programs and systems are not the measure of success. Committed and dedicated individuals within systems - engaged in healthy and systemic collaboration as a result of established relationships - that operate said programs are the true measure of success. For teachers, school administrators and district level personnel that are in search of ways to understand and promote student achievement based on the Framework for Great Schools will find this research study helpful and useful for strategic instructional planning and professional development.

CHAPTER 3 METHODS AND PROCEDURES

This chapter presents information about the methods and procedures used for data collection and analysis in the current study. These methods and procedures provide context for the results that will be discussed and illustrated in the next chapter.

Research Questions and Hypothesis

Two research questions guided this study.

1. To what extent do teacher – principal trust, % ELLs, % SWDs, % NEED predict student achievement in mathematics?

2. Is there a significant difference in student achievement in mathematics between schools of high and low teacher-principal trust levels?

The following described the null and alternative hypothesis for this study.

1. To what extent do teacher – principal trust, % ELLs, % SWDs, % NEED predict student achievement in mathematics?

   $H_0 1$. There is no statistically significant relationship between Teacher – principal trust, % ELLs, % SWDs, % NEED and student achievement in mathematics.

   $H_a 1$. There is a statistically significant relationship between teacher – principal trust, % ELLS, % SWDs, % NEED and student achievement in mathematics.

2. Is there a significant difference in student achievement in mathematics between schools of high and low teacher-principal trust levels?

   $H_0 2$. There is no statistically significant difference in student achievement in mathematics between schools of high and low teacher-principal trust.

   $H_a 2$. There is a statistically significant difference in student achievement in mathematics between schools of high and low teacher-principal trust.

Research Design and Data Analysis

This research study utilized a quantitative methodology. Qualitative methodology seeks to answer the "how" and "why" questions in research. In contrast, quantitative methods seek to answer the "what" and "how much" questions in research, which is more appropriate for the research questions within this study (McCusker & Gunaydin, 2015). Quantitative methods investigate whether relationships exist among two or more variables in a single set of participants in their natural setting (Dobrovolny & Fuentes, 2008).

I imported data from Excel to SPSS Version 29.0 software for purposes of analysis. The statistical analyses used in this study were hierarchal multiple regression and independent samples t-test.

Research question 1 analyzed data using hierarchical multiple regression. The dependent variable was the school student achievement score, which represented the mean average score for a school on the Algebra I Common Core assessment for the 2017-2018 academic year. The independent variables were the trust element scores and student

demographics. Student demographics represented the percentage of enrolled students as ELLs, SWDs or NEED during the 2017 – 2018 academic year in each sample high school. The level of significance of rejection or acceptance of the null hypothesis is a p value of .05.

Laerd (2015) hierarchical multiple regression enables you to enter the independent variables into the regression equation in an order of your choosing. This has a number of advantages, such as allowing control for the effects of covariates on the results; and consider the possible causal effects of independent variables when predicting a dependent variable. Nonetheless, all hierarchical multiple regressions answer the same statistical question: How much extra variation in the dependent variable can be explained by the addition of one or more independent variables?

Research question 2 analyzed data using independent samples *t*-test. The dependent variable was the school student achievement score, which represented the mean average score for a school on the Algebra I Common Core assessment for the 2017-2018 academic year. The independent variables were schools with high and low trust element scores. In order to identify and categorize schools with high and low trust element scores, the NYC School Survey technical guide served a resource (see Table 3).

Table 3

Categorization of Trust Element Scores

Measure Score	Technical Guide Rating Category	High or Low
4.00 - 4.99	Exceeding Target	H
3.00 - 3.99	Meeting Target	H
2.00 - 2.99	Approaching Target	L
1.00 - 1.99	Not Meeting Target	L

Reliability and Validity of the Research Design

According to Creswell and Guetterman (2019), "reliability means that scores from an instrument are stable and consistent. Scores should be nearly the same when researchers administer the instrument multiple times at different times" (p. 158). Further, these scores should be consistent. According to the technical report, the reliability of the examination was analyzed with three additional statistical measures including standard errors of measurement, decision consistency, and group means (NYSED, 2019).

According to NYSED (2019), the standard error of measurement is defined as "the standard deviation of the distribution of observed scores for students with identical true scores" (p. 19). Fraenkel et al. (2019) further explain the standard error of measurement (SEM) as an index that reveals the extent to which a measurement would change under certain circumstances and that there may be a variety of ways that there may be standards of error for any given scores.

The results and observations in the technical report suggest that the scores from the New York State Regents Examination are linear from the scale scores of 0-65 and concave down from 65-100. The linearity of the scores is shown in Table 4 and can be inverted –U shaped patterns with some variations (NYSED, 2019).

According to NYSED (2019), decision consistency used to assess reliability answers the following question: What is the agreement in classifications between the two non-overlapping, equally difficult forms of the test? In essence, the test which may be administered three times (August, January, and June) and administered to the same group of students, the consistency of the measurement would be "reflected by the extent to which the classification decisions based on the first set of test scores matched the decisions based on the second set of test scores" (p. 23). Based on results in the technical report, and by using the Livingston and Lewis method, the decision consistency (see appendices) ranged from 0.88 to 094, and the decision accuracy ranged from 0.91 to 0.96. According to NYSED (2019), "for the Regents Examination in Algebra I, both decision consistency and accuracy values are high, indicating very good consistency and accuracy of examinee classifications" (p. 25).

According to Creswell and Guetterman (2019), "validity is the development of sound evidence to demonstrate that the test interpretation (of scores about the concept or construct that the test is assumed to measure) matches its proposed use" (p. 158). As per NYSED (2019), the exam measures students' achievement against the New York State learning standards. The validity of the scores for the Regents Examination in Algebra I is supported by multiple sources of evidence:

> Chapter 1 of the Standards for Educational Psychological Testing (AERA et al., 2014) specifies five sources of validity evidence that are important to gather and document in order to support validity claims for an assessment including, test content, response processes, internal test structure, relation to other variables, and consequences of testing (p. 28).

Test content validity should be valid for their intended purpose (NYSED, 2019), as this test measures student achievement on the NYS P-12 Learning Standards for Mathematics which are consistent with the Model Content Frameworks for Mathematics provided by the Partnership for the Assessment of Readiness for College and Career (PARCC, 2014) (p. 29). The test is developed with a detailed systematic process and is reviewed to ensure accuracy by staff that is thoroughly trained to assess such items.

Validity evidence is further provided by examinee response processes, which require evidence that students who take the exam are answering the questions that are intended by the assessment. Further, evidence documented in the report attests to the training and quality control of administration and scoring of the examination. According to NYSED (2019), "The implementation of rigorous scoring procedures directly supports the validity of the scores" (p. 33).

The internal structure of the examination was analyzed to ensure that the test is functioning properly and used as its intended purpose. This evidence is gathered by conducting statistical analysis to assess if the relationship is strong among test items and test parts (Creswell, 2019). NYSED (2019) noted that, "strong evidence exists that the exam is functioning as intended and is providing valid and reliable information about examinee performance" (p. 37).

The Sample and Population

Public data was drawn from a large urban school district in the state of New York. The district is a comprehensive Pre K3 – 12 school district with just over 1.1 million students and 66,827 teachers serving in a range of pedagogical roles. Presented in Table 4, the demographics and characteristics of students enrolled in the school system during the 2017 - 2018 school year. For this study, there were approximately 489 high schools included. Excluded from the study were charter schools and specialized high schools. There were approximately 417 schools that the archival data based on. Archival data included student achievement scores, teacher – principal trust scores, and percentage of enrolled student population in ELL, SWD and NEED.

Table 4

Demographics and Characteristics

Demographics	2017-2018
Total Enrollment	1,135,334
Teaching Staff	66,827
Gender	
% Female	48.6%
% Male	51.4%
Ethnicity	
% Asian	16.1%
% Black	26%
% Hispanic	40.5%
% White	15%
Student Characteristics	
% Student with Disabilities	20.4%
% English Language Learners	13.5%
% Poverty	79.4%

Instruments

2018 NYC School Survey

The NYC School Survey was developed based on the Framework for Great Schools (Byrk et al., 2010), which were designed to address the six components of the framework, which are (a) Rigorous Instruction; (b) Collaborative Teachers; (c) Supportive Environment; (d) Effective Leadership; (e) Family Community Ties; and (f) Trust. According to the New York City Department of Education's Framework & School Survey Technical Scoring Guide (2017), the NYC School Survey is administered annually to parents, teachers, and students in 6th grade and above. The survey was designed to gather information from school communities on the six elements of the Framework for Great Schools. The survey is organized as groups of questions relating to a measure, and groups of measures relating to an element. For example, the element of Trust is composed of five measures: Parent-principal Trust, Parent-Teacher Trust, Student-teacher Trust, Teacher-principal Trust, and Teacher-teacher Trust. The NYC School Survey includes groups of questions related to each of those measures.

The survey consisted of 26 sections, for a total of 123 items. The survey items are presented in a Likert format with 4-5 response choices (1 = Strongly disagree, 2 = Disagree, 3 = Agree 4 = Strongly agree, 5 = I don't know). The responses from the 2018 NYC School Survey from teachers and students within each school will be aggregated for analysis of teacher- principal trust and student - teacher trust.

June 2018 Regents Examination in Algebra I Common Core

The School Quality Reports share information on how schools are performing on the six components of the Framework for Great Schools, based on data from Quality Reviews, the NYC School Survey, chronic absenteeism, and movement of students with

disabilities to less restrictive environments (Framework & School Survey Scoring Technical Guide, 2017). Data from the 2017 - 2018 School Quality Guide - Online Edition will be collected and aggregated for analysis of student achievement outcomes, and student population and demographic characteristics for the proposed sample of schools to be included in the study. Student achievement outcome data includes results of state testing, credit accumulation, graduation, and many other measures of student achievement that are rated based on annual targets, reflecting rigorous but attainable goals and calibrated to incoming student factors. For this study, the student achievement measure will be defined as the Average Regents Score - Algebra I (Common Core) on the New York State Regents exam. Student population and characteristics will include gender, ethnicity, disability status, eligibility for free/reduced lunch.

Procedures for Collecting Data

The researcher is an employee in the district where the data is being analyzed. The researcher collected archival data by researching the New York State Education Department and the New York City Department of Education public internet files and compiled data from the 2017-2018 academic school year. The data were extracted from both educational websites. Once filtered, the data were exported into a Microsoft Excel Document and prepared for transferred to SPSS for analysis.

Research Ethics

After receiving approval from the University's Institutional Review Board (IRB), I conducted research from various local and state education department websites to find data related to my research topic and questions. All data collected were data available for public viewing and use through the local and state education department websites. As I

prepared Excel spreadsheets for export to SPSS to answer the research questions, I de-identified that data, removing any identifiers that could potentially identify a school and their corresponding metric scores. Excel spreadsheets with original data remained confidential with the researcher. At the end of the research, all Excel spreadsheets containing school identifying information were deleted from the researcher's computer.

Conclusion

Chapter three described the research methodology and described the following aspects of the researcher's study: research questions, research design and data analysis, the setting and population, sample, instruments, procedures for collecting data and research ethics. Findings from data collection and analysis are reported in Chapter 4.

CHAPTER 4 RESULTS

This chapter presents the results of the analyses and findings from the three research questions in the current study. These results and findings provide context for the discussion and conclusion in the last chapter. The results by research questions are outlined below.

Research Question 1

What is the relationship of students' disability status, ELL status, economic need and student achievement scores in mathematics?

A hierarchical multiple regression was run to determine if the addition of trust and then student demographics (English language learners, students with disabilities and economic need) improved the prediction of student achievement scores in mathematics. Table 5 depicts the descriptive statistics for this research question.

There was linearity as assessed by partial regression plots and a plot of studentized residuals against predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.929. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residual greater than $\pm$ 3 standard deviations, no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was met, as assessed by P-P Plot.

The full model of trust and student demographics (ELL, SWD and economic need) to predict student achievement scores in mathematics was statistically significant, $R^2 = .092$, $F\ (4,366) = 9.249$, $p < .001$; adjusted $R^2 = .082$. The addition of student

demographics (English language learners, students with disabilities and economic need) to the prediction of student achievement scores in mathematics led to a statistically significant increase in R^2 of .049, F (3,366) = 6.5377, $p < .05$. See Table 6 for full details on each regression model.

Table 5

Descriptive Statistics of Variables

Variable	Mean	Standard Deviation	N
Achievement	2.2091	1.00761	371
Trust	3.4769	.63237	371
ELL	.1405	.18216	371
SWD	.1929	.06675	371
Need	.7692	.14839	371

Table 6

Hierarchical Multiple Regression Predictions

	Achievement in Mathematics			
	Model 1		Model 2	
Variable	B	*β*	*B*	*β*
Constant	1.059		1.807	
Trust	.331	.208	.357	.224
ELL			-1.013	-.183
SWD			-2.545	-.169
Need			-.269	-.040
R^2	*.043*		*.092*	
F	*16.635*		*9.249*	
ΔR^2	*.043*		*.049*	
ΔF	*16.635*		*6.537*	

Research Question 2

Is there be a significant difference in student achievement scores between schools of high and low teacher-principal trust levels?

An independent samples t-test was conducted to compare student achievement scores in schools of high and low teacher-principal trust conditions. See Tables 7 and 8 for descriptive statistics. There was a statistically significant difference in student achievement scores for schools with high teacher-principal trust (M = 2.27, SD = 1.05) and low teacher-principal trust (M = 1.93, SD = .76) conditions; t (369) = 2.60, p = .010. These results suggest that high levels of teacher- principal trust really does have an effect on student achievement scores in mathematics. Specifically, our results suggest that when there is a high level of trust between teachers and the principal in a school, student achievement scores in mathematics increase.

The null hypothesis (H_o3) that there is no statistically significant difference in student achievement in mathematics between schools of high and low teacher-principal trust is rejected. The alternative hypothesis (H_a3) that there is a statistically significant difference in student achievement in mathematics between schools of high and low teacher-principal trust is accepted.

Table 7

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Trust Levels	371	1	2	1.19	.394	.155
Achievement Score	371	1.00	4.99	2.2091	1.00761	1.015
Valid N (listwise)	371					

Table 8

Group Statistics

	Trust Levels	N	Mean	Std. Deviation	Std. Error Mean
Achievement Score	High Trust	300	2.2749	1.04776	.06049
	Low Trust	71	1.9314	.76194	.09043

CHAPTER 5 DISCUSSION

The professional relationships that exist between administrators and teachers are factors that can influence students in the classroom. Natural hierarchical and political systems can impact those relationships (Scarr, 2011). Examining the relationships between the decision makers and lesson planners is essential in maximizing success for students. In the era of "high-stakes" testing, sustaining and improving student achievement are common focuses in schools across the country. One of the measurable factors in a professional relationship is the level of trust. Trust, as defined by Hoy and Tschannen-Moran (1999), is "an individual's or group's willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest, and open" (p. 189).

The researcher developed the current study to collect a numeric level of trust teachers have for their principal and to statistically analyze its relationship to student achievement; and to analyze the relationship between student achievement and schools of high and low teacher-principal trust levels. The study consisted of collecting archival data that represented measures of student achievement, trust levels and student demographics within a school. An extensive data analysis followed, which involved organizing archival student achievement and trust level data for over 400 high schools, computing hierarchical multiple linear regression and independent samples *t*-test, interpreting scatterplots, data, and making conclusions based on the quantitative analyses.

In research question 1, the researcher used hierarchical multiple regression analysis to enter independent variables into the regression equation in the order of his choosing to determine the possible causal effects of the independent variables when predicting a dependent variable. First, the researcher found that teacher – principal trust

predicts a positive change in student achievement scores in mathematics. When student demographics (ELLs, SWDs and NEED) were added to the regression equation, statistical significance increased, resulting stronger in a stronger impact on student achievement in mathematics.

In research question 2, the researcher used independent samples *t*-test to determine whether (mean) student achievement scores in mathematics differed between schools of high and low trust element scores. The researcher found that the mean scores were not equal and therefore accepted the alternative hypothesis.

This chapter concluded the researcher's dissertation and shared an interpretation of the results, an analysis of the relationships between the results and prior research, the implications of the findings, limitations experienced in the study, and recommendations for future research and practice.

Implications of Findings

Findings from this study indicate that there is a relationship between trust and student achievement. This supports the general theoretical rationale discussed previously, that positive professional relationships between school principals and teachers are related to academic benefits for students. This connection is important for leaders of all schools to embrace and nurture. Bryk and Schneider (2002) conducted research where trust was found to be a factor in schools that better embraced change. Daly (2009) indicated with the presence of trust and leadership approaches, that were participative and inclusive, lower levels of threat—rigid responses were predicted by teachers and administrators in performance improvement schools. Therefore, schools need to be able to adapt to change. It must also be an atmosphere where teachers do not feel that they are under a perceived

threat, which often limits flexibility in problem solving and reduces productive interaction.

There are many student demographics that are beyond the control of teachers and principals. A teacher or principal cannot change the status of a student with a learning disability; a student learning English as a second language; nor a students' socio-economic background. Many other unchangeable student characteristics exist. However, schools can focus on these student demographics to where students receive academic benefits. This study demonstrated how trust connects to student achievement. This connection must play a role for decision makers and lesson planners who are aimed at maximizing success for all students. By connecting the current study to the "Relational Theory of Trust," one can start to make connections between schools that have higher levels of trust with higher levels of student achievement. Respect, competence, personal regard for others, and integrity are essential components in creating an atmosphere of trust. Research warns that a serious deficiency in any one of the criterions can ruin the trust relationship (Bryk et al., 2002).

Therefore, it is important for schools to focus on collegial environments where obtaining and improving strong professional relationships are focused, in order to best support student achievement. It is an atmosphere where educators are risk-takers and are included in decision-making processes. Teachers need to feel that there is mutual respect between their principals and themselves. They should feel safe and not perceive any threat. Principals must have an understanding that their leadership style can impact student achievement. With high levels of comfort and trust, strong professional

relationships can be formed, which in turn will lead to a higher level of student achievement.

Relationship between Results and Prior Research

School climate was noted to have a positive effect on the learning environment or to be a significant barrier to learning. A high level of trust within the school climate was the key to transforming a learning environment which fostered high student achievement (Goddard, Tschannen-Moran, & Hoy 2001; Frieberg, 1998; Tschannen-Moran, 2004).

Research question 1 revealed that teacher – principal trust levels and student demographics (ELL, SWD, and NEED) statistically significant to the prediction of student achievement in mathematics. Consistent with the results above, the relationship between trust and achievement has been assessed to find factors in linking academic achievement, socioeconomic status (SES), and racial composition that were mediated by the levels of trust that teachers reported in students and parents (Goddard, Salloum, and Berebitsky, 2009).

Limitations of the Study

This non-experimental study has potential limitations. One limitation to this study pertains to the Trust element score that was used as a variable to measure teacher-principal trust levels. The Trust element score was obtained from an annual survey that is administered to students, parents and teachers and included questions within each measure in the Trust element: Parent-principal trust, Parent-teacher trust, Student-teacher trust, Teacher-principal trust and Teacher-teacher trust (see Appendix B). The current research sought to explore the relationship of trust between teachers and principals. Questions related to Parent-principal trust, Parent-teacher trust, Student-teacher trust and

Teacher-teacher trust are confounding variables and could have been eliminated from the research study to decrease variance and bias. Only questions related to Teacher-principal trust would have been most appropriate for this study and any future studies seeking to use the NYC School Survey as a survey instrument.

Another limitation to this study pertains to the score the researcher identified as the metric used to measure student achievement, which was the average mean score for a school on the 2018 Algebra I Common Core Regents exam. Student achievement is centered in all aspects and functions within a school. Student achievement can be measured in many ways such as attendance rate, graduate rate, or college and career readiness. For this non-experimental study, the researcher decided to use a state assessment that is typically required for graduation for all students from a New York State high school.

Recommendations for Future Research

As described in the limitations section of this dissertation, the NYC School Survey Trust element score included questions in five areas: Parent-principal trust, Parent-teacher trust, Student-teacher trust, Teacher-principal trust and Teacher-teacher trust. To strengthen the construct validity of this research in the future, only questions related to Teacher-principal trust should be used as a measure to summarize teacher-principal trust levels. Teacher-principal trust questions related to the Trust element score can increase the accuracy of the results and strengthen future studies.

This research design was non-experimental and quantitative. The goal was to analyze two or more variables to see if a relationship exists. Another recommendation for future research is conducting a study that is qualitative in design. While the current

research showed that a relationship exists between teacher-principal trust levels and student achievement numerically, it would be interesting to hear from practicing educators such as principals and teachers about their experiences with trust and student achievement. Multiple sources of data can include teacher and principal interviews, and teacher data such teacher observation reports or teacher-reported student achievement data. A qualitative research design is expressed in words and would allow us to understand concepts, thoughts and real-world experiences to enhance the understanding of teacher-principal trust and its impact in the school setting.

Recommendations for Future Practice

The New York City Department of Education is the largest public-school system in the United States of America. In 2021 - 2022, there were 1,058,888 students enrolled in 1,859 schools in NYC public schools. From the perspective of importance in identifying areas where large school systems can concentrate efforts to facilitate students' academic success, this study recommends placing value on establishing strong professional relationships and teachers' trust in the principals.

Scarr (2011) found that teachers and staff have better working relationships with principals who exhibit leadership characteristics of openness and collaboration. They felt part of a team that centered on the same goals and visions of the school. Authoritative styles of leadership resulted in lower levels of trust and general concern in issues of trust in the workplace. An area that could further be researched is the leadership style of the school principals and how it relates to trust and student achievement. As discussed in the prior literature, the style that an administrator portrays is different from trust in an

institutional setting. That style could also have a significant connection to both levels of trust and student achievement.

School district leaders can create professional learning communities for new and seasoned principals and assistant principals that could focus on how trust can weaken or strengthen relationships, resulting in changes in student achievement levels. Explicit and intentional planning and practice connected to the topic of trust and its impact on teachers and students would greatly benefit school communities and school improvement efforts.

A final recommendation is the necessity for school principals to abandon the traditional managerial method of "top-down," authoritative leadership behavioral styles and to adopt leadership methods that follow more inclusive approaches to school leadership. As Tschannen-Moran (2004) stated, trust is very important, and as this study revealed, the establishment and maintenance of trust is heavily dependent on the principal's leadership style of behavior. Through the development of strong professional relationships, levels of trust can be elevated which can ultimately lead to greater student achievement.

APPENDIX A IRB APPROVAL LETTER

From: **IRBSTJOHNS** <irbstjohns@stjohns.edu>
Date: Thu, Apr 16, 2020 at 3:47 PM
Subject: IRB-FY2020-518 - Initial: Initial - Exempt - St. John's
To: Barbara Cozza <cozzab@stjohns.edu>, Rickey M. Brown <rickey.brown08@my.stjohns.edu>

Federal Wide Assurance: FWA00009066

Apr 16, 2020 3:46 PM EDT

PI: Rickey Brown
CO-PI: Barbara Cozza
Dept: Ed Admin & Instruc Leadership

Re: Initial - IRB-FY2020-518 An Investigation of Teacher-Principal Trust on High School Students' Achievement in Mathematics

Dear Rickey Brown:

The St John's University Institutional Review Board has rendered the decision below for An Investigation of Teacher- Principal Trust on High School Students' Achievement in Mathematics.

Decision: Exempt

PLEASE NOTE: If you have collected any data prior to this approval date, the data must be discarded.

Selected Category: Category 4. Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met:

(i) The identifiable private information or identifiable biospecimens are publicly available;

(ii) Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects;

(iii) The research involves only information collection and analysis involving the investigator's use of identifiable health information when that use is regulated under 45 CFR parts 160 and 164, subparts A and E, for the purposes of "health care operations" or "research" as those terms are defined at 45 CFR 164.501 or for "public health activities and purposes" as described under 45 CFR 164.512(b); or

(iv) The research is conducted by, or on behalf of, a Federal department or agency using government-generated or government-collected information obtained for nonresearch activities, if the research generates identifiable private information that is or will be maintained on information technology that is subject to and in compliance with section 208(b) of the E-Government Act of 2002, 44 U.S.C. 3501 note, if all of the identifiable private information collected, used, or generated as part of the activity will be maintained in systems of records subject to the Privacy Act of 1974, 5 U.S.C. 552a, and, if applicable, the information used in the research was collected subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 et seq.

Sincerely,

Raymond DiGiuseppe, PhD, ABPP
Chair, Institutional Review Board
Professor of Psychology

Marie Nitopi, Ed.D.
IRB Coordinator

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