THE ACHIEVEMENT GAP: PREDICTING THE EFFECTS OF PROTECTIVE/RISK

FACTORS ON STUDENT GRADES

by

Kathleen Pechtold

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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APPROVED BY:

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ABSTRACT

The achievement gap has been extensively studied in urban and low-income schools. This study looked at the opposite end of the demographic spectrum to inform a wealthier, low-minority district of the predictive nature of risk and protective factors present in the lives of 10th-grade students as reported by the students. The purpose of this study was to see if student perceived effects of risk and protective factors in four environments have a predictive correlation to student grades. Using the socioecological framework the non-experimental, descriptive, correlational study used archival data to determine if risk and protective factors show a correlation for students reporting different average grades. The ordinal regression study, with the sample size of 805 10th graders from a high achieving, high income district yielded results that indicated that there is a predictive relationship between student self-reported grades and the protective and risk factors in their lives. The study found that students having low protection factors have approximately half the odds of getting high grades than those that reported having high risk factors. Students also reported that having high risk factors in their lives made them approximately three times more likely to have lower grades. This study provided data that quantifies previous assumptions about the predictive relationship between grades and the protective and risk factors in the various environments that impact students' lives.

Keywords: protective factors, risk factors, education, sociological framework

Copyright Page

Dedication

I dedicate this manuscript to a few important people who have made this journey possible. First, I must thank my husband Chris. When we first met, he asked me what one of my biggest goals in life would be. I replied that I wanted to get my doctorate someday. Following that answer, he has had me listed in his phone as Doc. He has believed in my ability to accomplish this goal from the beginning and has continued to prove his confidence in me every day since. He has encouraged me, searched for a statistics tutor, helped me find articles, sat quietly beside me so I could work and still be with him, and cooked us many meals while I pecked away at my computer. He has dried the tears and didn't let me quit when I thought I would never pass statistics 980. He is my greatest inspiration and he makes me a better human being every day. Thank you for this amazing life we have made, my love.

I must also thank my children who have put up with my need to accomplish this for myself. They have been so understanding of the time that this took. I want to thank Christy for taking the writing journey with me as she wrote her master's thesis while I wrote this. It was more fun because we did it at the same time. Thank you, Karie, for the editing, moral support, and brainstorming. Thank you Johnny, Michael, and Kyle for believing in me. I am a blessed mom. Finally, I need to thank my mom, Jean Doyle, for raising me to believe in myself and instilling the idea that a goal of self-fulfillment is a worthy goal.

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List of Abbreviations

Analysis of Variance (ANOVA)

Communities that Care Youth Survey (CTCYS)

Educational Testing Service (ETS)

Every Student Succeeds Act of 2015 (ESSA)

Individualized Education Program (IEP)

Institutional Review Board (IRB)

Multi-tiered System of Support (MTSS)

National Assessment of Educational Progress (NAEP)

No Child Left Behind (NCLB)

Pennsylvania Youth Survey (PAYS)

Professional Development (PD)

Response to Intervention (RTI)

School Improvement Plan (SIP)

Socioeconomic Status (SES)

Statistical Package for the Social Sciences (SPSS)

Variance Inflation Factor (VIF)

CHAPTER ONE: INTRODUCTION

Overview

Ever since the Sputnik launch and the realization that America's education system may not be the best in the world, educational researchers have been investigating, hypothesizing, and making policy changes with the goal of creating the world's best education for all of the nation's children. Though much has improved for many of the nation's children, the achievement gap continues to be an issue. In fact, as recently as 2016, research showed that, although the national achievements scores have risen, the achievement gap persists (Yoder, 2016). This achievement gap exists, not only between Caucasian students and African American students; it also exists between students who "have" and those who "have not" (Smeding, Darnon, Souchal, Toczek-Capelle, & Butera, 2013). For educators, it is not enough to recognize that educational changes must be made to support students who are behind their peers, it is also important for school systems to be educating the community and parents of students not performing with their peers. Furthermore, this gap exists in both rural and urban schools.

According to Daniel (2018), the education system is set up in such a way that it has created an opportunity gap that becomes the achievement gap, which connects to early childhood education and home access to education. Daniel's (2018) work opens the conversation about the achievement gap to include wealthier schools with students from homes with fewer opportunities. Because the gap exists even in wealthier, high-achieving schools, progress towards fixing the achievement gap can only be made if the causes and influences are identified based on risk and protective factors as reported through students' perceptions. Once these factors are identified, schools can begin to plan interventions to address the problem.

Background

When thinking about the achievement gap, most people immediately envision inner city, high-minority schools that are underfunded. However, the achievement gap exists in wealthier districts as well. The study of wealthier districts can be complicated because research and the previous attempts at reducing the gap has been done on poorer, lower achieving districts. Consequently, the achievement gap problem has remained an unsolved issue in both settings for over five decades (Jeynes, 2015). The term *achievement gap* is not always consistent. For the purposes of this study, *achievement gap* refers to the difference between certain populations of historically underachieving students (minority and/or low socioeconomic status [SES]) who are not performing with their grade-level peers. Because of this gap between their achievement and the achievement of their peers, more than one year's academic growth is required by the lower performing population in order to close that gap and help them get to their grade level expectations to increase their chances at an even playing field for success after public education. Finding solutions to making this extra growth happen has been a problem with a long history.

From a historical perspective, the achievement gap began as early as *Brown v. Board of Education* when schools desegregated (Dutton, 2015). The topic has been studied as early as the 1960s when James Colemen reported on the racial disparity in education (Dutton, 2015). That study was the first to look at the effect of desegregation. This study started a long series of initiatives and educational policies intended to improve the achievement gap, not the least of which was No Child Left Behind (NCLB). Unfortunately, the issue of the achievement gap continued to be complicated with no easy answer. Research that is more recent has pointed to various problems that contribute to the gap that ranges from problems in the home, to race, to SES, to problems in the school system.

Recently, Yeh (2015) found that two major factors contribute to the achievement gap: the conventional structure of schooling and individualizing task difficulty and feedback. This research points to the classroom and school system as the primary environments where progress in fixing the achievement gap may be found.

Two older, but substantial studies that have shed light on differing aspects of the achievement gap are that of Anderson (2012) and that of Fantuzzo, LeBoeuf, Rouse, and Chen (2012). Fantuzzo et al. (2012) studied only African American boys in urban public schools. Their findings uncovered a correlation between African American boys who also come from high-risk environments and experiences and low academic achievement. This study looked at community and school as they relate to an achievement gap for a subpopulation of an urban setting. Anderson (2012) followed up on the Fantuzzo et al. (2012) study suggesting that the racial caste system embedded in American society is a remnant of the differences in civil rights between African American and Caucasian children in education. This study suggests that the achievement gap is not as much caused by the risk/race connection as it is in the cultural ways that African American boys react to struggles versus the cultural ways Caucasian boys respond and tackle struggles (Fantuzzo et al., 2012). Both studies are limited to urban settings where there were limited resources, and both studies focused on the achievement gap as it relates to African American boys. This study is limited in that the gap also exists in other minority groups and other settings as well.

Research regarding the achievement gap in rural settings is less abundant and many times focuses on smaller community schools. Many studies of rural schools with achievement gaps are schools with high-poverty, high-minority populations, and most are in southern states where there are higher populations of people of color (Williams, 2010). According to a study done by

the National Assessment of Educational Progress (NAEP), even when both African American and Caucasian students attend high-minority dense schools and all student achievement is lower than the national average, the achievement gap still existed (Bohrnstedt, Kitmitto, Ogut, Sherman, & Chan, 2015). In wealthier districts where there are lower minority populations and more stable communities, questions surface about why there continues to be an achievement gap if some of the identified causes (such as high-risk communities and high-minority populations) are not present in the environments of students. A socio-ecological study aimed at analyzing student perceptions of influences on their success may provide some insight as to what risk and protective factors influence each population's achievement in order to inform the direction for interventions. Such a study would require a look into the various lenses of the socio-ecological model to include the home, school, peer, and community environments.

The socio-ecological model is a theoretical framework that considers the whole child and the effects that relationships have on the child's development, including the child's beliefs, values, and behaviors (Bronfenbrenner, 1990). This theory considers the nature versus nurture argument, landing more strongly on the influence of nurture as determined by the individual's context and based on various layers of an individual's environment (Johns, Beltran, Armstrong, Jayne, & Barrios, 2018). These structures include microsystem (immediate surroundings or family), mesosystems (those in close surroundings such as school), exosystems (parents' social systems and communities), macrosystems (values and norms from the greater society), and finally, chronosystems (systems relating to time and significant events that impact a child; i.e., death of a parent) (Bronfenbrenner, 1990).

Following Bronfenbrenner's work, a more recent critic of the model, Christensen (2016) added dimensions to the model. This new model is one in which resilience and entrepreneurship

are added as a way to answer for the individuals who do not rely on their various environments, but rather seek to breakout of those influences to create new ideas and concepts (Christensen, 2016). Because these added dimensions of resiliency and entrepreneurship are typically seen later in life, these additional categories of the model are especially important when studying adults, but is not typically evident in teens.

One recent example where the traditional Bronfenbrenner model has been used is in a study of what variables affect obesity (Carrete, Arroyo, & Villasenor, 2017). Carrete et al.'s study was based on researching the various layers of an individual's environment and relationships to determine correlations between obesity and those environments. Although this study was based on a different topic, it used the theoretical framework for similar purposes. This study used this theoretical approach to gain understanding of full system changes that cause obesity as opposed to one level of change (Carrete et al., 2017). Similarly, a socio-ecological lens needs to be used to determine what environmental variables are correlated with the risk and protective factors of students will help guide educator's plans for interventions and supports.

To illustrate further the value of using the socio-ecological lens to determine the multiple factors that influence a problem, a recent study looked at the protective factors for Australian families separated by service (Rogers-Baber, 2017). This study actually looked at various relationships, services, supports, and community constructs to determine what protective factors worked best to ensure positive experiences for families separated by military deployments (Rogers-Baber, 2017). This research provided Australian government military service branches with valuable information for planning when supporting military families and providing healthy systems at each layer of the socioecological model (Rogers-Baber, 2017). This study is an

example of how the lens can be used to incorporate system wide supports. The concept of system supports needs applied to the educational system to provide supports for students as well.

Current research has looked at many different aspects of the achievement gap, but the problem seems to be more complicated and multidimensional than one environment or solution can fix. Using a multidimensional model that looks at the various influences that shape a student's education requires a theoretical framework that considers more factors. The factors that need to be considered include school influences, home influences, peer influences, and community influences to determine why there is still an achievement gap in a wealthier, high-achieving district so that supports that have not been identified can be added.

Problem Statement

The problem is a lack of research from the students' perceptions of the influences on their success that investigates the achievement gap in different cultural and SES schools. Previous research has focused on urban and high-risk school districts that have high numbers of minority students and a low SES population or rural districts in poverty and with high-minority populations (Adelson, Dickinson & Cunningham, 2016). However, there is also an achievement gap in more rural districts where the minority population is smaller and the SES of most students is higher (Cross, Frazier, Kim, & Cross, 2018). Studies have not focused on the achievement gap in these wealthier, high-performing schools. Because studies have shown correlations between SES and performance on standardized tests, gaining the perceptions of students in higher performing, wealthier schools could potentially shed light on the risk and protective factors that exist when the community SES and general educational performance is high (Williams, 2010).

A recent study done by Educational Testing Service (ETS) followed the history of the achievement gap problem from as early as Brown v. The Board of Education through modern day studies showing that the gap continues to exist and, in fact, has shown little if any progress since the inception of NCLB (ETS, 2017). This ETS study, though not grounded in socio-ecological theory, does focus on the individual, interpersonal, community, organizational, and policy/enabling environments and how there has been no narrowing of the gap despite the many efforts at identifying contributing aspects of each of these socio-ecological interactive realms (ETS, 2017). However, ETS focused on standardized test results with a broad sweep that includes poor, high crime, low-educated communities, drawing conclusions that the community and family characteristics have the greatest impact on achievement. Little research has been done when the community surrounding minority students does not fit this mold. The problem of a persistent achievement gap for minority and low SES students in wealthy, educated, and high-achievement communities has not been studied.

Furthermore, previous studies have not been done using student perceptions of what factors impede their academic success. When examining current research on students' perceptions, it becomes apparent that most of the research has been based around what motivates students (Horak & Galluzzo, 2017), what teaching methods are successful (Horak & Galluzzo, 2017), what learning styles work for students (Owston, York & Murtha, 2013), and the perceptions of gender gravitation towards certain content areas (Cousins & Mills, 2015). One of these studies focused on middle school students' perceptions and researched the other end of the educational spectrum focusing on gifted students' perceptions of their achievement using problem-based learning (Horak & Galluzzo, 2017). The proposed research looked at the

perceptions of students and what hinders their achievement compared to students who have found more success.

This study sought to use the socio-ecological framework to examine the achievement gap in a high-performing school based on students' perceptions of their environments and how those layers of environments correlate to the student perceived academic success. The study made a correlation between the self-reported academic successes and identified perceptions of risk and protective factors, and then comparing high-achieving students to low-achieving students should determine what layer of environment (family, peer, school, or community) to consider for intervention and supports.

Purpose Statement

The purpose of this study was to identify students' perceptions of risk and protective factors and if they have influenced the levels of success of the high-achieving students and low-achieving students in a high-achieving school district. This study looked at the overall multiple independent variables of home, school, peer, and community risk and protective factors to determine the predictability of their effects on dependent variable of student grades; this multi-regression study examined students' perceptions to determine potential next steps. The results of the A through F grade categories compared and analyzed interventions for all, some, and a few based on a Multi-tiered System of Supports (MTSS). This study looked at the perceptions of students from a district with the goal of providing some insight into the risk and protective factors and the impact they have on student achievement in high-achieving, wealthy schools. The district is situated in a college town whereby the average community member's education is a master's degree and about 82% of the high school graduates go on to postsecondary education. The student population is about 82% Caucasian, 2% African American and about 9% Asian.

The remaining 6% is a mix of Hispanic, Multiracial, and Native American students. About 16% of the student population is considered low income, most of whom have graduate student parents connected to the university. This demographic makeup is unlike most other achievement gap researched communities. The information collected provided insight for other such districts where the demographics of their achievement gap population may not be like those other studies have presented. Student perceptions are also important voices to add to the conversation when considering solutions for the achievement gap.

Significance of the Study

The achievement gap has been studied from many directions including various settings, academic markers, levels of teacher training, and even various influences. However, most often, these studies have been focused on urban, high-risk districts and the measures tended to be either behavioral/discipline records or academic records (Anderson, 2012). Although these populations, settings, and measures have added great insight to the discussion about ensuring that all students have equal opportunities to achieve, few have been conducted in high-achieving wealthy districts. Furthermore, Anderson (2012) stated, "I suggest the need for a qualitative component to complement any such study, one that could and would take into account the point of view of the subjects themselves" (p. 597). This study, although quantitative, sought to get that student voice and fill that part of the literature gap. Other studies suggest the need for research to be more multidimensional.

Current research seems to focus on what the school system can do to solve the gap problem. Gillian-Daniel and Kraemer (2015) looked at the gap from a professional development perspective. Following their creation and research of a professional development model aimed at tackling the variously defined instructionally related problems that contribute to the achievement

gap, they concluded that, "Educational systems are complex, and improvement is an iterative process" (Gillian-Daniel & Kraemer, 2015, p. 40). Their research looked at one aspect of the issue and came to the conclusion that although the value of focusing on one aspect cannot be diminished, there is a need to continue to look at the other complex systems that influence student success as it relates to the achievement gap (Gillian-Daniel & Kraemer, 2015).

Another gap in the research exists in the study of higher income versus lower income districts. One study that did focus on the two socioeconomic spectrums looked at the effects of self-affirmation interventions on student success using the two differing environments (Protzko & Aronson, 2016). Protzko and Aronson's study concluded that there was no statistically significant difference in student achievement based on self-affirmation interventions. Although this study did consider the different socioeconomic school settings, their results did not add to the literature concerning why there is an achievement gap in some wealthier districts as well as lower income districts. There remained a need to look at wealthier districts from a new perspective.

This study sought to fill a gap in the research by studying a district that fits a different profile from the current studies and by analyzing data gained from the 2017 survey of student perception research. In one of the few older studies done on the achievement gap in a high-achieving school, the authors concluded that further research needed to be conducted around the local school communities' culture and its effects on students' perceptions of their race (specifically African Americans) as it is situated in a predominantly Caucasian, wealthy school (Tyson, Darity & Castellino, 2005). The proposed study was to look at the students' perceptions including the risk and protective factors of the community where the students reside.

Finally, this study examined student grades to uncover both ends of the spectrum. First, the study sought to identify if protective factors help high-achieving students do their best, and on the other end, it sought to identify if risk factors are impeding the low-achieving students. Such information can be used to inform a MTSS for next steps. According to Webb, Johnson, Meek, Herzog, and Clohessy (2018), more than 70% of schools nationwide are currently using MTSS as a means of identifying needs and supporting student struggles as a form of academic, social, and emotional supports (Webb et al., 2018). Understanding what factors students identify as roadblocks to their success paves the way for informed tiers for intervention. Supporting and educating all students is the elusive goal that has the nation shifting from NCLB to Every Student Success Act (ESSA). Considering what the students' perceptions are while also investigating a population of students in a high-achieving district that has not been considered with the same body of research is the next step in research.

Research Questions

RQ1: How accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors as measured by student responses on the PAY survey?

RQ2: How accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors as measured by student responses on the PAY survey?

Definitions

1. *At-risk* - Students identified as potentially in danger of poor academic performance as measured by lower SES and lower standardized test performance and antisocial behaviors (Marchetti, Wilson, & Dunham, 2016).

2. *Achievement Gap* - A difference in national test score achievement based on minority status with Caucasian students being the higher achievers as measured by "a drop in grades, standardized-test scores, course selection, dropout rates, and college-completion rates, among other success measures" (Ansell, 2018, p. 1).

3. *Protective Factors* - Experiences and relationships that act as buffers during times of stress, change, and growth that work to support a child's or individual's wellbeing as measured by the PAY survey (Rogers-Baber, 2017).

4. *Risk Factors* - Experiences and relationships that have the potential to put a strain on the wellbeing of a child or individual as measured by the PAY survey (Rogers-Baber, 2017).

5. *Multi-Tiered System of Supports* - Once named Response to Intervention (RTI), this program is an intervention system that is tiered to meet various levels of need based on academic, behavioral, social, and emotional needs. (Positive Behavioral Interventions & Supports, n.d.).

6. *Socioeconomic Status (SES)* - A classification based on people's cultural, economic, and sometimes social standing in a community (Rubin et al., 2014)

7. *Pennsylvania Youth Survey (PAYS)* – A survey adapted from the Communities That Care Youth Survey (CTCYS, 2004) designed to measure the risk factors and protective factors as they relate to behavior problems in youth (Baker, 2014).

Table 1

Protective Factors

	Healthy Beliefs and Clear Standards	Bonding	Opportunities	Skills	Recognition
Community					
Rewards for Prosocial Involvement		x			x
Family					
Family Attachment		x			
Opportunities for Prosocial Involvement		x	x		
School					
Rewards for Prosocial Involvement	x	x			x
Opportunities for Prosocial Involvement		x			x
Rewards for Prosocial Involvement		x			x
Peer/individual					
Interactions with Prosocial Peers		x		x	
Rewards for Prosocial Involvement		x		x	
Belief in Moral Order		x			
Religiosity		x			

Table 2

Risk Factors

	Substance Abuse	Delinquency	Teen Pregnancy	School Drop-Out	Violence	Depression & Anxiety
Community						
Low Neighborhood Attachment	x	x			x	
Perceived Availability of Drugs	x				x	
Perceived Availability of Handguns		x			x	
Community Laws and Norms Favorable Toward Drug Use, Firearms, and Crime	x	x			x	
Family						
Family History of Antisocial Behavior	x	x	x	x	x	x
Poor Family Management	x	x	x	x	x	x
Family Conflict	x	x	x	x	x	x
Parental Attitudes Favorable Toward Drugs and Antisocial Behavior	x	x			x	
School						
Academic Failure	x	x	x	x	x	x
Low Commitment to School	x	x	x	x	x	
Peer/individual						
Rebelliousness	x	x	x	x	x	
Gang Involvement	x	x			x	
Perceived Risk of Drug Use	x	x	x	x	x	
Attitudes Favorable Toward Antisocial	x	x	x	x	x	

Behavior and Drug Use							
Friend's Use of Drugs	x	x	x	x	x		
Interaction with Antisocial Peers	x	x	x	x	x		
Depressive Symptoms	x			x		x	

CHAPTER TWO: LITERATURE REVIEW

Overview

As with any study, understanding the research history around a given topic is essential to gaining validity and context to the study. For the history and context of this research, several topics need to be discussed to pull that context together. Those topics begin with the theoretical framework through which the study will be investigated. There is no current research that uses the same theoretical framework to study risk and protective factors based on student responses in this particular setting. The literature review also discusses other studies that incorporated these relevant topics in studies for different purposes and settings.

Theoretical Framework

This study used a socioecological theory framework. The literature discussing socioecological theory is extensive. Urie Bronfenbrenner first proposed the theory in the 1970s. Rosa and Tudge (2013) extensively discussed Brofenbrenner's work as a theory that looks at the process of human development through various phases and how the environments in which each human is situated influence those developmental phases. These environments include microsystems (individuals in direct contact), mesosystems (families and close social relationships), exosystem (organizational, community), macrosystems (local, state, and national laws) and finally chronosystems (drastic events that affect the individual such as death of a family member) as seen in Figure 1.
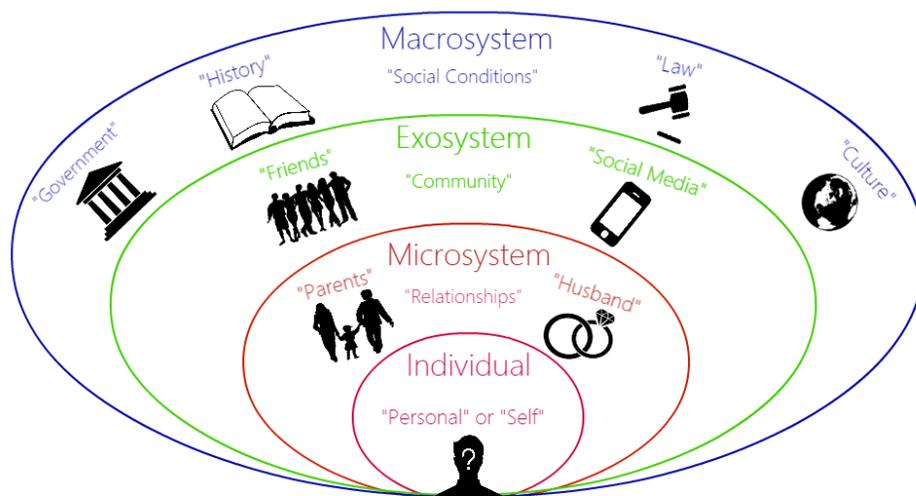
Figure 1. Social ecological model (Pechtold, 2018).

Bronfenbrenner's theory extends previous theories such as Maslow's (n.d) hierarchy of needs, where Bronfenbrenner's theory considers not only the priority of needs, but also the effects of the environments on the individual's ability to succeed and function effectively in the various environments. Bronfenbrenner's main premise, according to Tudge (2016/2017), was that, "he termed his theory 'ecological' because he viewed development as arising from the interaction of individuals and the contexts in which they were situated" (p. 195). This would include how those various situated environments affect a child's ability to succeed in academics.

Since Bronfenbrenner's work, others have looked at the pros and cons of this theoretical model. According to Christensen (2016), Bronfenbrenner's work is somewhat limiting because the model does not take into consideration the interactive influences of others. In other words, the Bronfenbrenner work limits the emotional connections and interaction of people within a group. This perspective is newer and is not valid when the model is used in conjunction with the subjects' perception on the influences on their success.

There was a need for a study that looks at using this theoretical lens to determine if these environments provide risk and protective factors and can they predict academic success based on student reported information. This study provided that additional information about the power of environments to either support or cause risk to a child's academic performance.

In previous research, the socioecological theory has been used as the framework for examining many issues as a holistic approach to looking at human behaviors. One such study used the sociological framework to determine the various environmental factors that influence childhood obesity (Carrete et al., 2017). Carrete et al. (2017) conducted a study in Mexico in response to the World Health Organization's reports on childhood obesity. Using the framework to look at the various environments that can influence children's exercise, education, cultural acceptance, and family habits unearthed some factors as stronger than others (Carrete et al., 2017). Carrete et al. (2017) looked at microsystems, macrosystems, and exosystems to determine which of the systems have an effect on the obesity of children with the goal of using their research to make changes in whatever systems had the greatest impact on the problem. According to their study, family habits and governmental policies are two stronger factors that need to be realigned to reduce the rates of childhood obesity (Carrete et al., 2017). Although this is a very different topic of study, it uses the same framework to be able to look at a multifaceted problem.

The socioecological framework has been used for academic research in the past. Abril and Bannerman (2015) used the framework to look at ways to study the factors that affect music programs in school. By using music teachers as their participants, their research found that micro level (school) factors have the greatest impact in their music program participation (Abril & Bannerman, 2015). They also found that the second greatest factor was macro (district)

factors. The researchers used this research to inform schools and districts of their ability to change the levels of participation in school music programs by recognizing the power of the messages in each environment (Abril & Bannerman, 2015). Again, the framework was used for a different topic for the same purpose of environmental targeted response to make changes. This was the same goal of the current study.

Empirical Evidence

To date, no research has been conducted that encompasses all aspects of this study. However, several studies have been done of similar topics with the goal being to uncover students' support needs. One such study was done by Wozniak-Brown (2017) where the researcher used the socioecological theory to look at the effects of the different environments on the creation of a community culture, specifically a rural community in Connecticut. Although this study focused more on the macrosystem effects on the exosystem, the theory is used to investigate the effects that one environment has on the personality of the other environment. This study used its results to inform the rural community of ways to protect various positive cultural aspects of the community, as well as some risks that could serve to negatively impact the community. The Wozniak-Brown (2017) study was more limited in its scope and looked at a system's functioning in looking at one environment's effect on another as opposed to the current researcher's goal of looking at an individual's functioning in multiple environments. This pairing of environments with factors that either help or hurt the sustainability of wanted traits is in keeping with the current researcher's study that sought to find if factors of protections and risks can predict students' academic performance.

The theory used in this study has been used in the past to research potential supports for needs of the subjects. One such study done by Rogers-Baber (2017) used the socioecological

theory to look at the risk and protective factors of military families separated by deployment with the purpose of finding supports for military families. This study takes the effect of a military support system (mesosystem) to families affected by long-term separation (chronosystems or the drastic events that affect the individual). The researcher's purpose was to inform the Australian Defense Force of ways to support troops and their families to ensure the best possible adjustments to the separation of families, so that they could reduce the risk factors and increase the protective factor. Like the current research, this study broke down the effects of the other environments to increase the possibilities for correction and support. Most of the research cited in this study was to support the need for more research concerning help for military families, such as Cologon and Hayden (2012) and Baber, Fussell, and Porter (2015). The framework supports a research study based on the need for supports for students as well.

Typically, the achievement gap has been studied with an explicit focus on race. One study that has that focus and that is perhaps the most closely related that uses an educational setting and incorporates issues of the achievement gap is an older study done by Brand, Glasson, and Green (2006). This study, although done using a different theoretical framework (socio cultural), looks at the effects that the community culture has on African American boys' perspective of science and math. This study looks at this population's perceptions based on how the community values math and science for African American males. This study takes the individual's perceptions (microsystem) and looks at the community's (exosystem) expectations and culture biases towards two academic content areas. Although this study is not situated in the same theoretical lens, the student perception and the investigation of the effect that an environment has on an individual are the same as the current study. Their study showed, not only that the expectations of the community and the school both had an influence on how the

participant performed in the math and science courses, but also that the students felt powerless to make a positive change to reduce the effects of their school and community environments. Brand et al. (2006) cited several other older sociocultural studies that supported the validity of their study. This study is narrower by looking at a limited subculture and limiting the study to two content areas.

Australians, Vella, Cliff, and Okely (2014), chose a different setting to conduct their socioecological theory study with the purpose of finding interventions for extracurricular dropout reduction. In their study, they sought to identify the socioecological influences on childhood participation and dropout rates of organized sports. The purpose of their study was to inform the Australian government of the environmental influences that either supported or caused risks to the childhood healthy habits of participating in organized sports. The study's ultimate goal was to identify the environments so that interventions could be planned. Although this study's purpose was different, it used the same theoretical framework to find potential interventions, as is the goal of the current study. One difference is that the Vella et al. (2014) study used predictive statistics. Their study completed four waves of data and manipulated some variables as the study progressed. The current study used archival data and ordinal regression to determine if the risk and protection in the various environments can predict grades. The other common aspect of this study is in its protective characteristic. The Vella et al. (2014) study also looked at the protective factors because the goal of the study was to identify and intervene to create the desired outcome. Most literature cited in this study was focused on studies that supported the benefits of both organized sports and the connection between the socioecological framework environments with organized sports study (Vella et al., 2014).

Related Literature

The related literature must include a historical view. This looked at the needs in relationship to risk and protective factors, as well as how the history of the achievement gap relates to student need.

Historical Literature

As early as the 1950s, it became clear that educational inequity was a problem to be solved. According to Maslow's (n.d.) hierarchy of needs, students must have certain needs met in order for them to learn and reach their greatest potential. Maslow's hierarchy acknowledges the effects of safety, feelings of belonging, physiological needs, and self-image on a child's ability to learn (Maslow, n.d.). This commonly accepted concept of education and needs takes into account the child's entire life, including family and community, as being influential to a child's ability to learn. Maslow's approach insinuated that schools cannot do it alone and that the environments that influence a child's life have an impact on their ability to learn.

In the years following Maslow's work, several national programs were started to address these needs. Through programs such as the Economic Opportunity Act of 1964, the creation of Head Start, and the mandates of the Elementary and Secondary Education Act of 1965, the government legislated the requirement that schools make changes that would close the achievement gap (Guskey, 2005). Out of these programs, the nation began to fund and mandate attempts at solving the achievement gap. Most of these attempts focused on the rights of minority students and the responsibility of the school to ensure equity.

These various attempts expanded to include economic support, cultural awareness training, individual student supports, and school-based supports. Such programmatic supports continue to exist today (Jeynes, 2015). By 2001, NCLB had become the avenue to legislate the

responsibility of ensuring equity in education. The act's name insinuates the problem that some children still are, and have been, left behind their peers. NCLB mandated many educational programs aimed at trying to close this gap. These include Title I to improve the academic achievement of low-income students, Title II aimed at training highly qualified teachers and principals, Title IV focused on community education centers to teach safe and drug free behaviors, and Title V provided parents with the power to make educational choices (U.S. Department of Education, 2017). The U.S. Department of Education recognizes that the achievement gap exists and that it was, and continues to be, a complicated and multifaceted problem. Furthermore, Liston and Renga (2015) pointed out that the gap has become a political hotbed and is an example of the bipartisan work by the U.S. government to not only legislate programs and provide finances to reduce the gap but also to publicly expose the continued problem through publications, such as Time magazine and documentaries such as Waiting for Superman. These media sources often insinuate that the blame and responsibility rests on the educational system.

The most recent adaptation to governmental intervention to solve the gap problem is that of ESSA (U.S. Department of Education, n.d.). Although the title again insinuates that without ESSA, every student would not succeed, this new act makes some changes in processes and practices in education in another attempt to reduce the achievement gap. The new act has specific changes aimed at high expectations for all students (especially those from previously underperforming populations), protections for high-needs and disadvantaged students, early education, and accountability expectations for low-performing schools (U.S. Department of Education, n.d.). According to the U.S. Department of Education (n.d.), "The new law builds on key areas of progress in recent years, made possible by the efforts of educators, communities,

parents, and students across the country" (para. 2). If the U.S. government recognizes that progress has been made possible by all influential environments of a student's life, future studies need to focus more specifically on what variables have the most impact and influence on student achievement. These changes again point to the need for equity in education.

All of the political initiatives are intended to solve the racial and socioeconomic differences that have been found to be causes of the achievement gap. However, Valant and Newark (2016) found that Americans are more inclined to face and solve the socioeconomic issues of educational inequity than they are in solving the racial reasons for the gap. Furthermore, Americans understand and can explain the wealth-based gap more easily than they can the race-based gap. Although this is vital research with political implications, it does not look at the problem of an achievement gap in a more financially stable community. This study was broad and looked at the differences between the two cultural settings as opposed to looking at the various influences of individual students. With all the recent efforts, perhaps students' voices needed to guide the discussion and are the potential next steps for reaching out to schools, communities, and homes to make changes that can support the reduction of the achievement gap.

Achievement Gap

Research related to the achievement gap is exhaustive, and yet, as already discussed, the problem remains. An older meta-analysis that looks at the characteristics of schools that have been somewhat successful in reducing the achievement gap found that the problem is complicated (Leithwood, 2010). Based on his literature review of 31 articles about districts that have been successful in reducing the achievement gap, Leithwood (2010) determined several characteristics of these districts. They include strong visions that connect to student learning, intentional inclusion of reducing the achievement gap into the strategic plan, firm student

performance standards, strong information systems that support data tracking, using data to determine educational direction, strong relationship with families and community that focus on changes needed to improve student performance, strong focus on instructional leadership by the school leadership, financial commitment to professional development, and improved capacity within schools to make changes based on the data (Leithwood, 2010). This review proved a number of elements that the current study uncovered. Using the student perceptions data of the environments that hinder or support their educational success to make strong instructional changes using the MTSS framework, this study took the strong focus on community, data based decisions, and improving the capacity within the school can all be met by the current research. The current study also looked at a setting that has the financial means to make some changes based on the results of the study.

Typically, studies have focused on inner city urban schools or high-poverty, high-minority rural schools, but rarely on high-achieving, wealthy districts. Some studies have focused on one environment or another. For example, Jeynes (2014) studied the school setting by comparing students with an achievement gap in public schools with those in private schools. In an effort to determine if the school environment was a variable in the achievement gap and to determine if school choice could reduce the achievement gap, Jeynes (2014) studied private religious schools versus public schools. This study found that there is a 25% narrowing of the achievement gap in private religious schools. His findings worked to support the school choice initiative. However, this study assumes that all religious-based schools can and will achieve the same results, and it assumes that religious-based private schools are available to all students. In the district in which the current study was conducted, the private religious high school is very small and not an option for most students because Pennsylvania does not have a school choice

option for religious schools. Achievement gap students may not have the financial support to make this choice. The Jeynes (2014) study does looks at one environment that the current study considered. However, the current study did not make comparisons between multiple school settings.

The other typically researched aspect of the achievement gap is that of race. Moore's (2017) study is an example of current research focusing on race. Moore (2017) looked at the ratio of race between school personnel to student population to determine if the ratio had an influence in reading and math scores. Her research found that having a more balanced ratio did indeed create better reading and math scores. These findings speak to both a cultural and a school solution to improving the achievement of students who have an achievement gap. However, the study again looked into school-related supports that focused only on the school and only with a certain population. It also did not address why there is still an achievement gap in some schools where this ratio is not a variable. This research does not look at the entire students' lives from their perspective. There was a need to look at the other aspects of the students' lives, including how the community and home affect their educational success.

The effect a community has on a student's academic success is also a relevant research topic. Flono (2015) conducted research in the community setting using community forums where members of a community met to discuss and deliberate about the achievement gap problem with the goal of finding ways to intervene. The study was qualitative and relied on observations, interviews, and transcriptions of the forums. Forums mediated in 11 communities where the outcomes and results were different in each of the communities (Flono, 2015). The important results included the discovery that many people in each community did not know that the gap existed or what it meant. Each community had its own unique issues that they

determined contributed to the gap. Most communities found that students were the key participants in the solutions, and that some aspects of students' lives interfered with their education (Flono, 2015). All of these findings are essential in looking at how the community responds and works together to reduce the achievement gap, but no research was done to determine what aspects of students' lives were protective factors or risk factors so that the support being made could be intentional. The current study sought to identify the predictive nature of those risk and protective factors through a quantitative study.

In keeping with the theoretical premise that multiple environment aspect of looking at student support needs, the student's home was another area that has been researched. Piescher, Colburn, LaLiberte, and Hong (2014) did a study that focused on the gap for children in Child Protective Services. Children in the Child Protective Services system are children who have been maltreated or whose home lives were unsafe. As discussed earlier, Maslow's (1954) hierarchy of needs supports the validity of studies such as this by focusing on the basic needs of a child and how the absence of those basic needs hampers a child's ability to learn (Piescher et al., 2014). The purpose of their study was to prove the need for attention to be given to students in Child Protective Services to ensure supports for closing the gap (Piescher et al., 2014). Using binary logistic regression of math and reading proficiency scores of students in Child Protective Services, their study's findings confirmed the absolute presence of an achievement gap in children in Child Protective Services (Piescher et al., 2014). This study incorporates the setting of home and the effects of a home environment on academic achievement. The current study took into account students' perceptions of their home lives to determine how various aspects of home were either protective or risk factors. The current study did not identify children in Child Protective Services.

The achievement gap has also been researched form a financial perspective. In 2015, Wang, Algozzine and Porfeli used the same statistical method to study similar environments. Their study looked at community capital (the financial, relational, and social factors) and student achievement based on standardized tests (Wang et al., 2015). Using aggregate composites of school and community characteristics, this study also used archival data of some southern schools' academic achievement measure on reading and math standardized exams and compared them to parents' income levels, ethnicity, and gifted and students identified in need of an Individualized Educational Program (IEP). The descriptive study showed a reinforcement of current research that there is an association between ethnicity and family income poor academic achievement. The central point of the research was to associate community capital and academic achievement to determine if an improving community could also improve academic success. They do mention, however, that it is a cyclical problem in that positive community capital creates strong schools, but community capital is hard to increase where there are poor performing schools. Although this study reinforces and lends its results to the current study, it does not look at student perceptions and its purpose is not connected to school programing.

Research on schools can include school settings in more than just the public school setting. One study included private schools. Adelson et al. (2016) conducted a statewide study where the goal was to determine more longitudinal conclusions about the achievement gap in Kentucky based on data over multiple years and multiple grade levels. Adelson et al. (2016), using National Center for Education Statistics from the 2015 statistics, looks at students' background and school and district characteristics to find patterns across both public and private schools. The results validated some need to hold districts and schools accountable as well as showed that students, when given the chance for higher achievement in lower grades, carry

forward to high achievement in upper grades. These findings shed light on the need to avoid subgrouping students to classify them as high, medium, or low groups, in essence, fulfilling the self-fulfilling prophecy. Finally, this study supports the value in examining standardized testing data over multiple years and comparing current data with specific populations to prior data. This study has value in that it reinforces several current beliefs about what causes the achievement gap and why it has been difficult to solve. This broad view is different from the current study in that it the current study sought to identify needs for school policy changes as opposed to focusing on individual student perceptions to inform programming.

School policy from country to country can be very different. Globally, Vairez, Hermond, Gomez, and Osho (2017) sought to look at the achievement gap in a less progressive society of Belize to determine if the same gap happens and if so, whether the factors that determine the gap the same as the US. This qualitative study looked at their higher income areas and compared them to the lower income areas. Using the standardized scores of required exams, the study looked at the factors of community setting (southern schools being low income and northern schools being more affluent), gender, and age. Using an analysis of variance (ANOVA) to determine differences in the academic scores for students in the North compared to those in the South, the results of the Belize study showed that there is a statistically significant difference in the academic achievement between the two areas. Although this study looked at the settings as they related to income, it did not look at or make a predictive determination in the multiple factors as the current research. It also did not take into account student perceptions.

The achievement gap proves to be a very illusive and difficult problem to solve. One community decided to collaborate around a solution for both the racial and socioeconomic aspects of the gap (Miretzky, Chennault, & Fraynd, 2016). Miretzky et al. (2016) wrote an

article about one such success story in a Chicago public school district. Miretsky et al. (2016) told the story of success amidst a selective enrollment process in the very poorly performing public school system. Their story goes on to explain that the very nature of the neighborhood public school system that stratifies students both racially and socioeconomically adds to the overall problem, but also that using a selective enrollment process has merit. This collaborative group gathered with the determination to intentionally select the population of their school based on an equal representation of race and socioeconomics across four neighborhoods. Their initiative proved to provide a more culturally rich and inclusive school. Although they have not completed the data analysis, they are confident that there have been academic improvements. This story is an excellent example of how the community has an impact on student success. However, without firm data, their conclusions are unverifiable. It is an example of another study looking at the community influences on student success.

Wealthy versus Poor Districts

The achievement gap is not just a race issue. For many years, there have been assumptions that poorly financed schools have a lower achievement rate. According to Pettigrew (2009), there is a statistically significant difference in student achievement in math, science, and social studies, but not language arts for students from low SES. However, the topic is muddied by that fact that many low socioeconomic schools also have a high-minority population (Boschma & Brownstein, 2016). Furthermore, the effects of the concentration of minority students in low socioeconomic schools has been extensively studied and proven a perpetuator of the achievement gap for both the socioeconomically disadvantaged and minority populations (Rothstein, 2015). The current research sought to eliminate the financial and minority factors by studying a more affluent setting and looking at student perceptions to see if there is a difference

in the risk and protective factors of students' grade categories. The proposed study was conducted in a setting where there was an achievement gap, but where the achievement gap students were a minority academically because most of their peers were higher achieving and came from wealthier homes (Pennsylvania Commission on Crime and Delinquency, n.d.).

Another book that focused on the financial impact on the achievement gap was that of Duncan and Murnane (2014). Their book, *Restoring Opportunity: The Crisis of Inequality and the Challenge for American Education* takes more than the school into consideration when looking at the potential solutions for the achievement gap. The major focus of their work is the connection between school and home and the change in American culture over the last several decades. As they pointed out, today's culture requires more education and because of this, students who come from lower income families and schools have a greater hurdle to overcome to reach the added needs for education today versus even two decades ago. Although this point is relevant, the connection that this work has to the current study is that the authors looked at the contribution of factors outside of the school and spent significant time discussing the home and its effect on student success. This book, although looking at lower income versus wealthier districts, wraps up the conversation by claiming that the answers lie in looking at the whole child, including their support systems in multiple environments (Duncan & Murnane, 2014). In their final statement, Duncan and Murnane (2014) stated that the answer for educators lies in strong leadership, a collaborative culture, and collective responsibility. This work supports the current study through the conclusions that, regardless of income level, there are steps schools can take. The current study sought to gain data to add to that collective responsibility and inform the steps that educators can take.

One way to inform those steps is by looking at schools that have made progress in improving their achievement gap. In a book that highlights the success of several school districts to improve their achievement gap, Blankstein, Noguera, Kelly, and Tutu (2016) wrote about five principles of leadership that lead to achievement and equity for all students. The authors put together this compilation of real-life success stories was pulled together to show how the connection between school, home, and community based collaboration, and equity for all students, regardless of income, can support student success. The work goes on to highlight several schools that are succeeding in overcoming the achievement gap by focusing on school morale, collaborative relationship between home and school as well as within school, and respect among teachers and with parents. Each of the stories focuses on something other than financial means to improve the achievement gap. The current study acknowledged the problem of only looking at finances to improve equity for all based on the study being done in a wealthier school district where there is still evidence of an achievement gap. Although Blankstein et al. (2016) uncovered some strong anecdotal evidence to be considered as part of the bigger picture of this complex problem, the data comes from the school leaders without student voice included. The current study took archival data and repurposed it to gain this additional perspective and add to the research that points to a collaborative approach to support students.

One extensive qualitative, ethnographic study that does examine the achievement gap in an affluent setting is that of Ogbu (2009). In his book, *American Students in an Affluent Suburb: A Study of Academic Disengagement,* Ogbu not only studied an affluent community, he also looked at various settings' influences on student achievement. Through observations, group discussions, and formal documents, Ogbu (2009) studied an affluent school and sought to answer the question about why specifically African American students struggled to be as engaged and as

successful as their Caucasian peers. His study specifically looked at schools, family, and the community. His findings uncovered various influences tied to expectations in all settings and how some of these expectations conflicted. Ogbu (2009) found that the culture at home was often the opposite of the expectations of the community and school. In his conclusions, one important finding was that schools cannot just have high expectations of African American students; they must also teach African American students how to succeed within that community. Although this work is perhaps the most similar to the current research about the achievement gap in an affluent community, student perceptions were not a part of the study. The goal of the study was not to inform a system of supports, and it is an older study. The current work looked at the 10th-grade population's perceptions to gain perspective on whether the environments either supported their achievement or were risk factors to their achievement.

Risk and Protective Factors

Research that looks at risk and protective factors has typically been used when looking at the likelihood of people engaging in risky behaviors, such as drug and alcohol abuse, overeating that leads to obesity, teen pregnancy, and dating violence. The current study used data that was collected for the purpose of uncovering the risk and protective factors for such behaviors and repurposed the data to look at how the environments where such risk and protective factors came from have an impact on student achievement. In order to understand how the current study fits into previous research and fills a gap in that research, several previous studies can add perspective.

Risk and protective factors, as described by the National Institute on Drug Abuse (2003), are tied to research efforts to determine how negative behaviors begin, progress, and can potentially be avoided. The emergence of this principle stems from resiliency research (Luthar,

2006). There are many studies that tie risk and protective factors to drug use, but there are few that use this framework for determining academic success based on such factors. The Pennsylvania Youth Survey (PAYS) is one tool that uses this research principle to investigate which factors in a youth's life are protective and which are risk factors (Baker, 2016). Spice, Viljoen, Latzman, Scalora, and Ullman (2012) used risk and protective factors to examine the recidivism of sexual offenders. Their research showed that protective factors had a greater impact on reducing recidivism than did risk factors (Spice et al., 2012). This study sought to compare the two factors and looked at negative behaviors after they had been perpetrated in an effort to find out how to avoid recidivism. The current study, using a tool created to identify risk and protective factors, looked at the effects of the different environments with the goal of not only stopping already in place negative factors, but also on putting in place protective factors to ensure that higher-achieving students continue to succeed. The current study can inform a MTSS to both avoid recidivism of negative academic risks and the addition of supports as identified by the study.

One of the supports and risk factors measured in the PAYS data is that of the perceptions and practices of the students' family members. Similarly, East and Hokoda (2015) conducted a study where they surveyed young adolescents concerning not only their own risky behaviors but also that of other family members. Their research questions were, "Does engaging in high-risk behaviors and having friends and an older sibling who engage in risky behaviors will be associated with a higher likelihood of victimization?" and "Does sharing a lot of activities with a high-risk older sister at age 13 will be associated with victimization by age 18?" (East & Hokoda, 2015, p. 1290). The survey asked questions based on both risk and protective factors to determine the significance of each. The findings showed that both engaging in and being

exposed to risky behaviors at age 13 would increase the likelihood of victimization by age 18. The protective factors were indeed exposure to positive influences. This study adds credibility to the use of surveys that ask protective and risk factor questions as viable research and considers student perceptions. The current study did the same but included the effects that risk and protective factors have on academic achievement.

Risk and protective factors can be used to study other student struggles. Peters and Woolley (2015) conducted a study that used risk and protective factors to analyze academic success. They used risk and protective factors within the school setting to determine if the testing environment based on pressure and challenge had an impact on student achievement on a test. Although the purpose of this study was to look at the effects of pressure and competition on student success as measured by manipulating the testing environment, it does validate the use of risk and protective factors to analyze academic success. This study also used a multiple regression to analyze manipulated environmental controls of rules, boundaries as well as supports of adults in the school, family, and home settings. The controls were divided into both adequate and inadequate controls and supports. The study was conducted on students who all had the same average grades on their report cards. Their findings indicated that too much control and not enough support would indeed hinder educational success. This study had some limitations because adequate and inadequate are both broad based and not individualized by learner. The current study eliminated that limitation by using students' perceptions.

Student perceptions are difficult to research but add a necessary component to considering what supports and hinders student academic achievement. Arthur et al. (2015) did an academic based study that took student perceptions into account that had a completely different purpose. The purpose of this study was to provide data based direction for school

administrators looking to adopt a drug and alcohol curricula. In an effort to answer the question, "Which factors influence the test scores of students in schools," Arthur et al. (2015) sought to look through the lens of prevention by looking at risk and protective factors and inform administrators who struggle with knowing where to spend their limited resources to improve student learning (p. 497). This study did this by using anecdotal data from several different sources, from 237 schools and 171 districts. One of the data points used was a survey that asked questions that were very similar to those in PAYS but much more limited in number. This study also analyzed connection between demographics and academic success. Their findings in this area were in keeping with other studies that there is an achievement gap for low-socioeconomic and minority students. They also found that there is a connection between risky behaviors and poor academic achievement as well as a connection between support or protective factors and academic success. Their conclusions stated that based on their findings, there is a connection between risk and protective factors and academic success and that schools are an appropriate place to address the social and emotional needs of students. This study is probably the closest find to the current proposed study with a slightly different purpose and process. Although both studies sought to inform the actions and teaching of the schools, the Arthur et al. (2015) study did not have the targeted intervention goals. The proposed study looked at the environments and the students' perceptions to inform the creation of support for future students who, on the biannual PAYS study, report their risk and protective factors. The current study's results can inform an MTSS model that provides more targeted interventions than a decision about curriculum.

Multi-Tiered System of Supports

MTSS is the new term for Response to Interventions (RTI), which finds its roots in several research arenas such as "applied behavior analysis, precision teaching, curriculum-based measurement (CBM), and effective teaching" (VanDerHeyden, 2012, p. 12). This instructional model incorporates various levels of supports for meeting academic, social, and emotional needs of students. The premise of the model is such that some supports (e.g., differentiation) are in place for all students. Students who need more supports find those supports in a second tier where only some students need the additional support. Finally, the top of the intervention tier is identified for those few students who need yet more supports and is typically a more individualized plan. This structure of supports seeks to ensure that all students have their needs met. The MTSS model is used for academic, social, and emotional needs. The proposed study sought to inform a MTSS model for academic needs.

Implementing an MTSS system can be a complicated process because the system expects that every student is known and supported based on their individual needs. To understand the process, Vekaria (2017) conducted administrator interviews to understand how administrators walk through the process of creating an MTSS program within their school. The study uncovered the main essential factors for a successful implementation were collaboration between administrators and teachers, a differentiated approach to teaching, and a strong culture owning all students. This study was done with elementary students, which is the most common level for an MTSS program. However, the model is beginning to move into the high school level requiring new research and ways to identify student needs in order to create the tiers and supports accurately. This study will be used for such a purpose.

Tiered support systems must be based on research that determines what supports are appropriate for the students they serve. One study (Porter, 2015) that researched the needs of students for a MTSS program is the study about supports being used in the Pinellas County Schools' School Improvement Plan (SIP). This district used a MTSS program to specifically support their achievement gap students (Porter, 2015). In Porter's (2015) study, the goal was to determine if the interventions were being conducted with fidelity to determine if the district's SIP was indeed improving learning. Using a mixed method study, Porter (2015) used achievement gap data, surveys of parents, students, teachers, and principals to determine if the SIP was reaching the goal of reducing the district's achievement gap, specifically for the African American population. Her findings showed incomplete fidelity of using the interventions, but that the majority of teachers were following the SIP with fidelity. Her findings resulted in helping the district refine their SIP, provided suggestions for supporting fidelity for implementing interventions, and gave suggestions for families of achievement gap students based on the survey results. This study was similar to the current study in that its purpose was to inform a district to assist in appropriate corrective actions, it looked at more than one environment, and it sought to inform the reduction of the achievement gap. Porter's study also included information from students and families and at least looked at solutions and suggestions for more than just the school. This study lacks in-depth student perception because the survey of students was very short and had a limited response rate. The current study was only student perceptions and had a 100% response based on archival data of each student present the day of the original PAYS.

MTSS framework can be used to determine need from more than just the student population. Venello (2017) used this strategy to look at teachers' needs by pairing teacher

efficacy and school climate to evaluate the success of their MTSS program. The study specifically examined how teachers felt about their practice and the relationship between the teachers' feelings of success and school climate. Venello (2017) evaluated the MTSS as a tool for helping teachers feel supported in their instruction and abilities to see students improve based on the MTSS model set up in their schools. Although this study is new and does seek to inform about the teachers' feelings about the MTSS as a tool, it does not include student perceptions, is not intended to look at informing the specific interventions in the MTSS model for the school, and does not look directly at student achievement. This study simply gives another perspective of how the MTSS can improve student learning through supporting teachers and reporting on how this system can improve school climate.

For teachers, one of the biggest problems when implementing a MTSS approach to improve student success is to know how to identify each student in need of support, as well as what targeted supports need to be in place. One of the nation's leading professional development (PD) teams on the training of educators on successful MTSS practices is the *Solution Tree* organization. Some members of this PD team wrote a book, *Simplifying Response to Intervention: Four Essential Guiding Principles,* which highlights two significant elements of the current study (Buffum, Mattos, & Weber, 2012). The first is the collective responsibility of all members of the school to own every student by supporting their individual needs (Buffum et al., 2012). They went on to discuss specifics of how to get administrators and teachers on board for understanding the collective responsibility for the success of every child (Buffum et al., 2012). They did not address, however, the students' contribution to the collective responsibility. The current research considered the students' voice as an added data point for determining need. Buffum et al. (2012) also discussed the process of data collecting to ensure that every student

who needs support is identified. Each of the suggested data points will indeed uncover academic gaps and needs. However, none of the data points include external environmental factors nor does it include student perceptions. The current study filled that gap and used the additional data to inform a high school MTSS.

Although MTSS has been used at the elementary level for several years under the term RTI, in more recent years, there has been a push to shift the RTI model into the secondary level. Callender (2014), in his book about implementing a MTSS model in the secondary school setting, used data about dropout rates, illiteracy, and prison rates to justify the need to move the MTSS program into the last few years of students' required public education. He mentioned that some keys to making a MTSS program successful is good data-based decision making, a solid systems approach, strong tiered teams, and effective problem solving (Callender, 2014). Most of Callender's work focuses on the educational gains that can be seen using a MTSS approach with little discussion on the mental health and anxiety needs that high school students also exhibit and find as obstacles to their success. Callender's (2014) work supports the current study by legitimizing the need to base the intervention approach on solid data and to use that data in a systematic approach through intervention. The current study went one step further with the data by looking at student perception as an added piece of data and looked at if the overall environments create social and emotional barriers to learning success.

Student Perception

The final body of research that must be discussed is the research that looks at students' perceptions of their own success. Because Institutional Review Boards (IRBs) require, rightfully so, many safeguards to ensure that minors are not being studied unethically, research based on students' perception is much less prevalent. More often than not, student perception data is

archival, as is the case with the current study. In addition, many times the studies on student perceptions are done in the collegiate level. This study looked at high school students' perceptions.

Student perceptions are valuable when the purpose is tied to what affects them emotionally. One recent study that included students' perceptions was that of Sullivan (2017). Sullivan's study entitled "A Secondary Analysis of Survey Data: Evaluating the Lifelines Suicide Prevention Program Among Middle School Students," looked at the success rates of a particular suicide prevention program based on students' perceptions. This study's purpose was to examine the program's success at teaching students suicide prevention strategies. Although it surveyed adolescent school students just like the current study, its purpose was much more limited and not at all focused on student perceptions but rather student learning of a particular program. The focus of this study was much narrower and was really an assessment tool of the suicide prevention tool.

Several studies exist that use student perceptions of various content classes. One such study looked at the students' perceptions of chemistry based on gender to determine if chemistry was a gender biased content area (Cousins & Mills, 2014). Dombrowski (2014) wrote her dissertation on "Middle School Student Perceptions of Mathematic Motivation and Teacher Support in a Higher-Income Setting," whereby she researched a specific content area using student perceptions. This study also looked at a higher-income school and was specifically addressed to middle school students. Although this study had these two similarities, there are few other connections to the current study.

Student perception research can also be useful for determining the connection between race and achievement. One study that did connect to the current study and race was that of

Tyson et al. (2005) where achievement gap and student perceptions were investigated. Tyson et al. (2005) surveyed high-achieving African American male students and the perceptions of their teachers in eight different school districts seeking to determine the effects of the power of "acting white" (p. 582). Although this is a qualitative study, and the findings suggest that the achievement gap for this population is not an effect of peer pressure to "act Black" by intentionally not performing or choosing higher-level courses, this is the only similarity to the current study (p. 583). Furthermore, the study sought answers for reducing the achievement gap and incorporated students' perceptions. It does so to answer a cultural question as opposed to looking to support interventions, as was the case with the current study.

Student perception research is also helpful when looking at a particular segment of a population. In a very recent study, Cross et al. (2018) looked at student perceptions of academic success of a very narrowly defined population. In their study, they looked at the achievement of gifted and low-income students' perceptions of barriers to their educational success. Both the parents and the students were studied during this qualitative analysis. The most important findings of this study had to do with the students' fit in their school setting. Because the students were low income, the schools they attended were also lower income schools. This study proved that there is a connection between the students' perceptions of barriers and less orderly and academically equal environments. The students and parents all reported that the less academically driven and abled students in a lower income school worked to be a barrier to high-ability students' success. Although this study does not have the same purpose, design, or goal, it does look at student perceptions to validate the necessity.

Student perceptions of their relationships at home and how those relationships affect their academic success is another more narrowed topic to consider. One study that had a minor

connection to the current study in this home realm is that of Gordon (2017). Gordon looked at the father's role in a student's academic success; however, he did not use student perception as reported directly from students. Instead, using a structural equation model, this study used the case files of 333 students in state custody and their perceptions as recorded by their caseworker to determine if there is a relationship between externalizing behaviors and the presence of a father in the home. In his conclusions, fathers are indeed a protective factor for student academic and behavioral success. The results, although for a very different purpose, show that student perceptions in connection to protective factors are a viable area of study. The current study had a parent component and included home as one of the overall protective or risk factors.

Another influence on students' perceptions of their success is that of the community. Post-graduation plans, student perceptions on how possible those plans are, and expectations that they are ready for those plans are based on the economy and the community that a student resides in. In a study about students' perceptions of the economy and job market as it relates to their futures, one research team went through the IRB process to get direct student perceptions. Hill et al. (2018) researched subjects who were 9th- through 11th-grade students in one public high school in a middle-income district. All students were surveyed in a single class period by the teacher, as was the case with the current study's PAYS. Using various measurement scales, the team's survey asked questions related to parent levels of education and family support, linking education to feelings of potential success in the future, parental involvement in school, and advice given by parents (Hill et al., 2018). They also surveyed school based supports, academic engagement, and perceptions of the job market (Hill et al., 2018). The data uncovered a few interesting conclusions. First, their research proved that high school students are indeed interested in and know about the job market and that they believe that just staying in school and

graduating will not be enough to ensure their success (Hill et al., 2018). These students believe that college is their ticket to success. In conjunction with these findings, the data showed students who feel connected to parents and their schools also feel optimistic about their financial futures (Hill et al., 2018). In addition, students who feel pessimistic about their financial futures reported that pessimistic media coverage of the economy and job market and fear of overwhelming college debt as their reasons for feeling pessimistic (Hill et al., 2018). This study, though having nothing in common with the topic or goals of the current study, does show the value of data gained from student perceptions.

Student perceptions of their own academic success comes from many different sources, not the least of which is their peers. In a study recently done of how peer validations of academic success influences student perceptions of their success, Altermatt (2017) collected student perceptions from middle school students to determine the power of active constructive peer responses. The two-year study looked at the responses of 359 students to a survey given by trained survey administrators. The correlational study looked at student perceptions of the correlation between feelings of success and both constructive and destructive responses of their peer. Their findings showed a correlation between academic avoidance and destructive peer feedback. The study was limited as its results were implied because it is not ethical to purposefully elicit destructive peer responses. Although this study has its limitations, it tackles one of the environments of the current study—that of the effect of peer interactions and academic success as reported by the students themselves.

Summary

There are many studies that look at each of the study subsets of theoretical framework, historical perspectives, achievement gap, risk and protective factors, student perspectives, and

MTSS models that succeed in giving added dimensions to their various academic wonderings. Additionally, the achievement gap and how to reduce it continues to be an elusive problem. Some studies have looked at different content areas, some at teaching methods, and many on the cultural effects on students' ability or inability to find success in the classroom. Previously, there were no studies that used a socio-ecological lens to look at student perceptions of the effects of various environments on their academic success. Using the PAY survey to look at risk and protective factors to identifying the relationship between grades and what was helping and what was impeding students' abilities to succeed in school will help to inform the educators' interventions. In addition, because the research incorporated archival data from a tool that used the same socioecological lens, it also adds to the current body of research by looking at student perceptions.

The current study is an added piece of the literature that informs one district (and potentially other similar districts) about what the various tiers of supports need to include. It did that by asking the following research questions: (a) How accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors, and any combination of these factors, as measured by student responses on the PAY survey? and (b) How accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors, and any combination of these factors, as measured by student responses on the PAY survey?

Although the current study did not identify minority and underrepresented students, the sample district believed that identifying risk and protective factors included, by default, the achievement gap population because their demographic information showed that their students who are not doing well in school were their low-socioeconomic and minority students. If the

PAYS can be used to look at protective and risk factor as associated with academic success as opposed to just informing Pennsylvania districts about the presence of risk behaviors, the current study is of value to districts other than the sample district.

CHAPTER THREE: METHODS

Overview

The purpose of educational research is to look at a particular topic objectively with the goal of basing educational practices on proven reality (Gall, Gall, & Borg, 2010). This research took the topic of the educational achievement gaps and looked at the factors that both helped and hindered educational success from the perspectives of the student based on their self-reported grades. The socio-ecological theory guided the research by looking at the students' responses to survey questions about the risk and protective factors in their community, family, school, and peer lives. Using the Statistical Package for the Social Sciences (SPSS) as the data tool and the Pennsylvania Youth Survey (PAYS) as the instrument, the research compared the grades of middle school students and compared those grades to the students' self-reported risk and protective factors for academic success (Green & Salkind, 2014). The results of the research provided data to support the decisions to be made when creating a Multi-tiered System of Supports (MTSS) at the high school level.

Design

This study was a non-experimental, descriptive, correlational study using archival data to determine if risk and protective factors show a correlation for students reporting different average grades. Gall et al. (2010) described non-experimental research as a study when the researcher does not alter the circumstances or conditions of the variables. In this study, there was no manipulation of conditions but rather used existing data to look at the data in a new way. The data retrieved from the survey relates to the independent variables of risk and protective factors and was studied based on the risk and protective factors from various environments of

peer, home, community, and school. The preexisting data identified these environments in each of the surveys.

Research Questions

The current research sought to answer the question, using the PAYS, is there a relationship between the risk and protective factors and student achievement based on student reported grades of A, B, C, D, and F? This question was examined by environments, based on the needs of this research, from the questions asked in the PAYS given to high school students in 10th grade in 2017. Districts typically use the PAYS to identify the prevalence of drug and alcohol risks, as well as high-risk behaviors. The current research used the data to determine if there was a relationship between the student achievement and the reporting of risk and protective factors. Looking at the potential existence and strength of the relationship could serve to inform next steps in a MTSS model of interventions.

RQ1: How accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors as measured by student responses on the PAY survey?

RQ2: How accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors as measured by student responses on the PAY survey?

Hypotheses

The null hypotheses for this study are:

$H_0 1$: There is no predictive relationship between home, peer, community, and school risk factors, or a combination of such factors, as measured by student reported perception on the PAYS survey and student grades as reported on the PAY survey.

H$_0$2: There is no predictive relationship between home, peer, community, and school protective factors, or a combination of such factors, as measured by student reported perception on the PAY survey and student grades as reported on the PAY survey.

Participants and Setting

The participants of this study consisted of approximately 550 high school students located in a district in central Pennsylvania. The study used archival data of the 10th graders' 2017 PAYS. This population of students would currently be in 11th grade. The school district is situated in a rural college town with a large university as its largest employer. The town's average education level is a master's degree. The high school is centrally located and pulls from two middles schools on each end of town. The district reported approximately a 17% low-income student population that is about 72% Caucasian. The district also struggled with an achievement gap in the historically underperforming populations of race, economically disadvantaged, English Language Learners, and special education. The total number of students who took the 2017 PAYS equals 472 students. This sample size was large, increasing the chances that the sample represents the population (Warner, 2013). This research used a sample that represented all students present on the day the survey was given. There were no real names associated with the data. The raw data identified the students numerically. Categories were determined and used based on students who self-reported having mostly As, Bs, Cs, Ds, and Fs. These grades served as the dependent variables that are compared to the independent variables of risk and protective factors in the various environments.

English teachers conducted the survey during the students' language arts instructional time. Teachers were given a script with explicit instructions for administering the survey (see Appendix B). Table 3 is the demographic data regarding age, ethnicity, gender, and grade level

as well as the comparison of the sample district to the state of Pennsylvania (Baker, 2016). This

study considered the 2017 data only.

Table 3

District Demographic Data

	District 2013		District 2015		District 2017		State 2017	
Survey Respondents	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All	1,637	100.0	1,851	100.0	1,772	100	253,566	100.0
By Grade								
6	474	29.0	460	24.9	443	25.0	62,971	24.8
8	448	27.4	484	26.1	434	24.5	70,214	27.7
10	322	19.7	497	26.9	472	26.6	65,164	25.7
12	393	24.0	410	22.2	423	23.9	55,217	21.8
Gender								
Male	814	49.8	912	50.2	870	49.5	124,823	50.3
Female	819	50.2	906	49.8	887	50.5	123,271	49.7
Ethnicity								
Yes, of Hispanic, Latino, or Spanish origin	84	5.1	95	5.1	97	5.5	33,940	13.4
No, not of Hispanic, Latino, or Spanish origin	1,533	94.9	1,756	94.9	1,675	50.5	219,626	86.6
Race								
Black, African American	70	4.3	68	3.7	59	3.3	22,272	8.8
American Indian	10	0.6	20	1.1	16	0.9	4,095	1.6
Asian/Pacific Islander	111	6.8	161	8.7	169	9.5	13,134	5.2
White,	1,320	80.6	1,407	76.0	1,343	75.8	179,972	71.0

Caucasian								
Multi-racial	94	5,7	112	6.1	114	6.4	14,065	5.5
Race unmarked	32	2.0	83	4.5	71	4.0	20,028	7.9

Note. District demographic data (State College Area School District, n.d.).

Instrumentation

The instrument used for this research was the Pennsylvania Youth Survey (PAYS). The PAYS was adapted from the Communities That Care Youth Survey (CTCYS, 2004) created by Dr. David Hawkins and Dr. Richard F. Catalano (Programs to Reduce Violence, n.d.). Both surveys were designed to measure the risk factors and protective factors as they relate to behavior problems in youth. Additionally, the PAYS was adapted to measure student self-reports on a three-form design intended to identify response rate differences from the beginning of the survey to those at the end (Baker, 2014). Both surveys were supported by EPiSCenter (n.d.), "a collaborative partnership between the Pennsylvania Commission on Crime and Delinquency (PCCD), the Pennsylvania Department of Human Services (DHS), and the Bennett Pierce Prevention Research Center, College of Health and Human Development, Penn State University" (para. 5). Both surveys have been used by public schools across Pennsylvania (with multiple revisions) since 1989 (Pennsylvania Commission on Crime and Delinquency, n.d.). The PAYS is given in the fall every other year to Grades 6, 8, 10, and 12 to over 200,000 students across the state with participant rates that range in the 60th to 70th percent (Pennsylvania Commission on Crime and Delinquency, n.d.). The survey is the state's primary tool for determining drug and alcohol, family, peer, and school trends (Pennsylvania Commission on Crime and Delinquency, n.d.). Questions are asked to cover four specific environments: community, family, school, and peer/individual. The four environments fit the socio-ecological theoretical framework.

The instrument had 120 questions using a five-point Likert-type scale ranging from Strongly Disapprove, Somewhat Disapprove, Neither Approve, Disapprove, Approve, to Strongly Approve. The current research used the results from all 120 questions and focused on the questions that related to risk and protective factors associated with the theoretical lens of the study. Questions based on substance abuse, weapons, and sensation seeking were included because they related to the relationships between the environments and the student.

According to Pennsylvania, the PAYS administration conducted a Cronbach's alpha process for the 2017 survey administration (Pennsylvania Commission on Crime and Delinquency, n.d.). The Cronbach's alpha value was 0.785. According to Gall, Gall, and Borg (2005), values between 0.7 and 0.8 were acceptable reliability values for instruments. In the initial survey analysis of 254 items and 200,657 entries in the data set, 47,290 entries contained the data required to calculate the reliability coefficient and used all of the questions in the instrument followed by a second analysis minus demographic information (Baker, 2014). The second analysis contained 223 items and 200,657 entries in the data set, of which 48,680 entries contained the data required to calculate the reliability coefficient (Baker, 2014). The original reliability testing included a three-form design (slightly varying the way the questions are asked for consistency and reliability) intended to identify if response rate differed from the beginning of the survey to end of study. Adjustments were made based on these reliability tests.

Procedures

The study was approved by the Liberty University Institutional Review Board (IRB). The PAYS data was archival data that used numeric identification. This survey was given to all 6th, 8th, 10th and 12th graders across the state of Pennsylvania during school and guided by a classroom teacher. The district obtained parent permissions for each survey six weeks prior to

the survey administrations through an opt-out form sent by both email and U.S. Postal Service (see Appendix A). The studied district was using the survey as information concerning drug, alcohol, and high-risk behavior patterns and trends. The current study provided additional information to the district based on viewing differences of risk and protective factors as reported by grades as academic performance indicators. Permission to use the data was secured through a permission application (see Appendix D). Release of the raw data was obtained through the Prevention Research Center for the purposes of further research to inform the MTSS through the district's Inclusive Excellence initiative for this sample district (see Appendix C).

The PAYS for 2017 consisted of approximately 120 questions each. The raw data used included all questions that related to the various environments that fit the socioecological model. For example, questions about neighborhood attachment were used as well as perceptions of family management. The responses of various grades of students were compared to risk and protective factors using the SPSS data management system. Conclusions concerning the hypotheses were determined following the study.

Data Analysis

For the hypotheses, a correlational study using logistic regressions was chosen because a correlational study allows the researcher to look at relationships between a large numbers of variables (Gall et al., 2010). The logistic regressions allowed the researcher to determine whether student reported grades were predictable based on risk and protective factors. Logistic regressions can also control for confounding variables. This is appropriate for this analysis because the study examined how risk and protective factors influenced and related to student grades (Gall et al., 2010). This study explored the causal relationship between the factors and the student self-reported grades.

The correlational study looked at the Likert-type scale responses of the risk and protective factors for academic achievement based on students' perceptions and looked for a correlation across grades. Achievement was determined by the students' responses to question A4 on the 2017 PAYS. The survey wording for the question was, "Putting them all together, what were your grades like last year?" with Likert-type scale responses of (a) Mostly As, (b) Mostly Bs, (c) Mostly Cs, (d) Mostly Ds, and (e) Mostly Fs. Coding of the dependent variable of grades was done by 0 = Mostly Ds and Fs, 1 = Mostly Cs, 2 = Mostly Bs, and 3 = Mostly As.

Logistic regressions was used to investigate the research questions. For this study, the independent variables were the overall risk and protective factors of the various environments. The study began by calculating R-squared (the multiple correlation coefficient) which was reported to determine the variance in the dependent variable, and was followed by adjusting the R^2 for goodness of fit (Gall et al., 2010). Next, the test of proportional odds was done to each independent variable to determine if each had an identical effect at each cumulative split of the ordinal dependent variable (Gall et al., 2010). The test of parallel lines was done to compare the two models. The assumption of proportional odds was tested by a full likelihood ratio test comparing the fit of the proportional odds location model to a model with varying location parameters (Gall et al., 2010). Assumption testing, including absence of multicollinearity, normal distribution, and proportional odds, was conducted as well. Overall model fit was determined by Deviance Goodness-of-fit and Pearson Goodness-of-fit tests (Gall et al., 2010). The analysis did include respondents who did not report their grades (dependent variable) in the 2017 survey. The original sample was $N = 843$ and the analytic sample $N = 805$ (95.49% of original sample).

The independent variables of risk and protective factors in various environments were used to determine the potential relationship as either positive or negative on the dependent variables of grades. The information from the research served to inform the next steps in educating and supporting each student population's home, school, community, and peer relationship and to determine if there were correlations that can inform educational practices within a MTSS framework.

This study is similar to previous research done by Yoder, Hansen, Ruch, and Hodge, (2016), which used a socioecological framework to analyze the school-based risk factors of youth sexual offenders. Their finding indicated that school-based protective factors can buffer the risks of sexual abuse and suggests further research be done in conjunction with schools and the delivery of school-based services for youth (Yoder, Hansen, Ruch, & Hodge, 2016). This research supports this study because it looks at risk and protective factors with the goal of making improvements for a specific population. Furthermore, it seeks to inform a school-based service for academic success. The current study followed the same framework using a different population for a different purpose and with a goal of informing school-based intervention to be incorporated into a MTSS model. This research sought to inform the creation of such a model. The design of this research followed the Yoder et al. (2016) theoretical framework but sought to see if the risk and protective factors can predict grades as reported by student. Analyzing the reported protective factors of higher-achieving students and comparing them to lower achieving students may serve to inform the need for additional supports for lower achieving students. Furthermore, comparing student perceptions could inform what is missing or needs removed from the environments of lower achieving students because they report them as risk factors. It

was the hoped that this study would uncover relationships that could be acted upon by this district and served as a model for other districts.

The final goal of the research was to inform the creation of ways to provide supports to those who lack supports and provide information to reduce the risk factors, all in an effort to reduce the achievement gap. This particular setting worked because the low-achieving students are predominantly members of the district's minority, low SES, and/or special education populations. This method analyzed the achievement gap in a wealthier, high-achieving district. This is a problem that previous research has not focused on nor has it looked at student perceptions.

Known Limitations of the Methodology

Although the theoretical framework and quantitate methods have been used in many studies, there are some limitations with the current study that must be discussed. The limitations include the validity of self-reported data, the nature of survey data, and the use of student self-reported grades as categories in a correlational study. Based on the data being archival, ex-post facto reduces some of the potential bias.

Research and discussions around the validity of self-reporting data had to be addressed as potentially a confounding variable based on the potential that there is a discrepancy between what a respondent will say and how they actually behave. According to Pannucci and Wilkins (2011), bias must be examined based upon the idea that bias happens when there is an introduction of encouragement for the respondent to choose one answer over another. Because the current study used archival data, the respondents had no knowledge of the purpose of the data to be used for a different purpose than that of the original PAYS purpose. Furthermore, Gall et al. (2010) defined bias as a perception of events the may be overlooked, distorted, or falsified.

This is particularly the case when the participant has a strong motive for wanting to sway the

results (Gall et al., 2010). Although the instrument asked the respondents their perceived

average grade, the purpose of the survey was to collect data on drug and alcohol use. This

disconnection between the purpose of the original data and the question about grades reduced the

potential for the respondents to want to sway the results that have no grade purpose.

Furthermore, the sample size was large enough to reduce the possibility that a large enough

number of respondents answered inaccurately. The original instrument accounted for the entire

state's grade dishonesty as seen in the Table 4 (Baker, 2016). The overall percent of students

found to be dishonest based on the cross-tabulation built into the original instrument was 2.1%

(Baker, 2016). For the purposes of the current study, the 2.1% of statewide respondent

dishonesty acknowledges this limitation and reality of the respondent bias when reporting their

average grade as seen in the table below.

Table 4

Grade Honesty Cross-tabulation

* X^2 Grade Cross tabulation			10th grade
Total Dishonesty	Honest	Count	56128
		% within X^2 Grade	97.9%
	Dishonest	Count	1182
		% within X^2 Grade	2.1%

The nature of survey data creates the need for further discussion around the validity of

the current study. Gall et al. (2010) stated that survey research is the collection of data around

the respondents' beliefs, attitudes, interests, and values using standardized measures. The

struggle to validate survey data was found in the fact that ideas, beliefs, and values are hard to quantify. However, the validity of the survey research lies in the sample collection (Gall et al., 2010). A systematic approach included random sampling, stratified sampling, equal access to participation, and multiple repeated sampling (Gall et al., 2010). The instrument used in the current data was open to all schools across Pennsylvania creating equal access. Large and small districts from various cultures across the state participate in the survey each year creating the stratified sample, and the survey is given every other year, creating the repeated sample. The PAY survey has met the criteria as a valid descriptive study instrument.

Finally, the use of the student reported grades as categories in a correlational study must be addressed. The PAYS used a Likert-type scale, and for the current study, the student self-reported grades are ordinal data, including the response to the question about student perceived average grades, which was the dependent variable of the current study. This question had the same number of option or response possibilities as every other question and therefore the answer to one question became the dependent variable and used as ordinal categorical data. This was because the grades are points of data that represent order of magnitude ranging from great grades, as reported by an average grade of A, down to failing grades, as reported by the average grade of an F. According to Norusis (2012),

> The SPSS Ordinal Regression procedure, or PLUM (Polytomous Universal Model), is an extension of the general linear model to ordinal categorical data. You can specify five link functions as well as scaling parameters. The procedure can be used to fit heteroscedastic probit and logit models. (p. 69)

The current study used ordinal logistic regression to predict the likelihood of an ordinal dependent variable based on one or more independent variables. The study provided evidence as

to which, if any, of the independent variables (i.e., overall risk and protection level) had a statistically significant effect on the dependent variable (self-reported grades), and provided evidence as to how well the ordinal logistic regression model predicts the dependent variable. This model included both risk and protection as independent variables predicting grades.

CHAPTER FOUR: FINDINGS

Overview

The purpose of the current study was to determine if there is a predictive relationship between student protective risk factors and their self-reported grades. Using ordinal regression, this study looked at the independent variable of the overall level of risk and protective factors and examined the relationship that those factors had to the dependent variable of student self-reported grades as determined by the answer to the question, "Putting them all together, what were your grades like last year?" The descriptive statistics for the dependent variable (self-reported grade), the analytic sample, the descriptive statistics for the independent variables (i.e., risk and protection factors), the ordinal regression results, the assumptions, the overall model fit, are all presented followed by an interpretation of the results.

Research Questions

RQ1: How accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors as measured by student responses on the PAY survey?

RQ2: How accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors as measured by student responses on the PAY survey?

Null Hypotheses

$H_0 1$: There is no predictive relationship between home, peer, community, and school risk factors, or a combination of such factors, as measured by student reported perception on the PAYS survey and student grades as reported on the PAY survey.

H$_0$2: There is no predictive relationship between home, peer, community, and school protective factors, or a combination of such factors, as measured by student reported perception on the PAY survey and student grades as reported on the PAY survey.

Descriptive Statistics

Dependent Variable

The dependent variable of grades was based on student reported answers to the survey question, "Putting them all together, what were your grades like last year?" Table 5 represents the frequency and percent of the students who reported their average grades for the previous school year. The data showed that the majority of the students were higher achieving and the number of students who reported Ds and Es totaled only nine students for the dependent variable of grades.

Table 5

Dependent Variable

Grades	Frequency	Percent	Valid Percent	Cumulative Percent
Mostly As	499	62.0	62.0	62.0
Mostly Bs	237	29.4	29.4	91.4
Mostly Cs	60	7.5	7.5	98.9
Mostly Ds	8	1.0	1.0	99.9
Mostly Fs	1	.1	.1	100.0
TOTAL	805	100.0	100	

Independent Variables

Level of overall risk and protection data for the independent variables (risk and protection) were originally conducted in two formats in the original data set. The first was a

separate overall score for each category included in risk and protective factors. The second was an overall accumulative score for risk and an overall accumulative score for protective. The first data set that included a separate overall score for each category included in risk and protective factors was abandoned because the distribution of the risk factors was statistically significantly skewed. The results for the second data set with the overall accumulative score for risk and the overall score for protective can be seen in Tables 6 and 7.

Table 6

High Level of Accumulative Risk

a^4	Low risk	High risk	Total
.00	3	6	9
1.00	20	40	60
2.00	142	95	237
3.00	402	97	499
Total	567	238	805

Table 7

Overall Risk Factor Frequencies

	Frequency	Percent	Valid Percent	Cumulative Percent
Low Risk	567	70.4	70.4	70.4
High Risk	238	29.6	29.6	100.00
Total	805	100.0	100.00	

Null Hypotheses $H_0$1: Risk Factors

Based on the results of the testing, the first null hypothesis is rejected. The results for

$H_0$1, "There is no predictive relationship between home, peer, community, and school risk

factors, or a combination of such factors, as measured by student reported perception on the

PAYS survey and student grades as reported on the PAY survey" were found based on overall

risk frequency. The Likelihood-ratio test as the overall model fit statistically significantly

predicted the dependent variable over and above the intercept-only model, $X^2(2) = 86.733$, $p <$

.001. This test compared the fit of the model to the intercept-only model giving an idea of the

value added. Based on this test, the null hypothesis can be rejected because the overall model fit

predicts a relationship. Finally, the null hypothesis must be rejected because of the odds ratio

being in a higher category of the dependent variable for students with low risk versus students

with high risk is 3.003, 95% CI [2.148, 4.198], a statistically significant effect, $X^2(1) = 41.361$, p

$< .001$.

The descriptive statistics were compiled by coding the independent variables into $0 =$

Low risk and $1 =$ High risk. The dependent variables were coded based on student reported

overall grades using $0 =$ Mostly Ds and Fs, $1 =$ Mostly Cs, $2 =$ Mostly Bs, and $3 =$ Mostly As.

Based on the overall risk, the data was collapsed to include Fs and Ds because there was only

one F in the sample. Table 6 shows the frequency of participants at low and high risk overall

who reported their overall grades as Mostly As, Mostly Bs, Mostly Cs, and Mostly Ds and Fs.

Table 6 showed that based on the combined results, this school has more students with low risks.

The next test conducted was to determine the overall risk factor frequency. As reported

in Table 7, the results showed that 29.565% of respondents reported high overall risk, while

70.435% of respondents reported low overall risk. Of respondents, 66.667% who received

mostly Ds and Fs reported high overall risk; 66.667% of respondents who reported receiving mostly Cs reported high overall risk; 40.084% of respondents who reported receiving mostly Bs reported high overall risk; and 19.439% of respondents who reported receiving mostly As reported high overall risk. The results of factor frequency showed that this school has more students with low risks, and that those students who reported high risk also reported not having good grades, while those reporting good grades were those students who reported low risks.

Assumption Testing

The first assumption tested was the test of multicollinearity. Multicollinearity refers to when two or more independent variables are highly correlated. Multicollinearity was assessed using the Tolerance and Variance Inflation Factor (VIF) statistics. Table 8 reports the results of the test of multicollinearity with a Tolerance greater than .1 and VIF is less than 10. The VIF assumption requirement was 1.25. This assumption was met by showing the strength of the correlation as seen through the requirement of less than 5.

Table 8

Test of Multicollinearity

	Coefficients[a]		
Model		Tolerance	VIF
1 High Level of accumulative risk		.800	1.250
Total 805		100.0	100.00

Note. a. Dependent variable: a^4 reversed.

The second tested assumption was to test for proportional odds. Testing for proportional odds ensured that each independent variable has an identical effect at each cumulative split of the

ordinal dependent variable. The test of parallel lines compared two models. The first represents

the null hypothesis as a proportional odds model while the other model represented the

alternative hypothesis as a model when proportional odds is violated. To pass the assumption,

the two models needed to be the same. This assumption was narrowly met, but was found to be

above .05. Assumption of proportional odds was assessed by a full likelihood-ratio test

comparing the fit of the proportional odds location model to a model with varying location

parameters, $X^2(4) = 8.965$, $p = .062$. The results are seen in Table 9.

Table 9

Test of Parallel Lines[a]

Model	-2 Log Likelihood	Chi-Squared	Df	Sig
Null Hypothesis	66.783			
Final	57.818	8.9	4	.062

Note. Null hypothesis states that the location parameter (slope coefficients) are the same across response categories. a. Link function: Logit.

Overall Model Fit

Using SPSS, several methods were used to assess the overall model fit. Three methods

were used to assess overall model fit of the ordinal regression model (i.e., a likelihood-ratio test

as well as Pearson and Deviance goodness-of-fit tests). While the likelihood-ratio test looked at

the change in model fit by comparing the full model to the intercept-only model, the Pearson and

Deviance goodness-of-fit tests measured how poor the final model was. Furthermore, the

reliability of the Pearson and Deviance goodness-of-fit tests were affected by cells with zero

frequencies or small-expected frequencies. As such, the likelihood-ratio test was preferred.

However, all three tests are reported to offer a more robust picture of whether the data fits the ordinal regression model.

As indicated by the likelihood-ratio test, the final model predicted the dependent variable at statistically significant levels over and above the intercept-only model, $X^2(2) = 86.733$, $p <$ .001 (see Table #). The Deviance goodness-of-fit test indicated that the model was not a good fit to the observed data, $X^2(7) = 18.327$, $p = .011$. The Pearson goodness-of-fit test indicated that the model was not a good fit to the observed data, $X^2(7) = 17.625$, $p < .014$ as seen in Table 10.

Table 10

Goodness of Fit

	Chi-Squared	Df	Sig
Pearson	17.625	7	.014
Deviance	18.327	7	.011

Note. Link function: Logit.

Although all three Cox and Snell, Nagelkerke, and McFadden were tested, to explain the variance of the model, McFadden was used because it was more conservative. It suggested that the model explains six percent of the variance. The results of all three are found in Table 11.

Table 11

Test of Variance

Pseudo R-square	
Cox and Snell	.102
Nagelkerke	.122
McFadden	.060

Note. Link function: Logit

Likelihood-ratio test was used to compare the fit of the model to the intercept-only model to provide an idea of the value added. The final model predicted the dependent variable at statistically significant levels over and above the intercept-only model, $X^2(2) = 86.733, p < .001$. While protective and risk factors improved the predictive power of the model, additional descriptive information (e.g., sex, grade level, and SES) may further improve the model. Each method clarified how well the data fit the model.

Table 12

Test of Intercept Only

Model	-2 Log Likelihood	Chi-Squared	Df	Sig
Intercept Only	153.516			
Final	66.783	86.733	2	.000

Parameter Estimates

The final data test was used to determine parameter estimates. Parameter estimates provided the researcher with information about the ability to predict the results of one-unit change of the predictor provided that all other predictors remained constant. For the current study, for students with overall low risk, the odds of having better grades was approximately three times that of students with high risk. In other words, students with low risk are much more likely to have better grades. The odds ratio of being in a higher category of the dependent variable for students with low risk versus students with high risk is 3.003, 95% CI [2.148, 4.198], a statistically significant effect, $X^2(1) = 41.361, p < .001$. For students with overall low protection, the odds of having better grades is approximately half that of students with high protection. The odds of students with low protection to have high grades is .560, 95% CI [.402,

.782] times that of students with high protection, a statistically significant effect, $X^2(1) = 11.610$,

$p = .001$. The results are represented in Table 13.

Table 13

Parameter Estimates

Parameter	B	Std. Error	Lower	Upper	Wald-Chi Square	df	Sig.	Exp (B)	Lower	Upper
Threshold										
a^4 reversed = .00	-4.119	.3618	-4.828	-3.410	129.581	1	.000	.016	.008	.033
a^4 reversed = .1.0	-1.945	.1880	-2.313	-1.576	106.999	1	.000	.143	.099	.207
a^4 reversed = .2.0	.091	.1652	-.232	.415	.306	1	.580	1.096	.793	1.515
High Level of accum. risk = .00	1.100	.1710	.764	1.435	41.361	1	.000	3.003	2.148	4.198
High Level of accum. risk = 1.00	0^a	-	-	-	-	-	-	1	-	-
High Level of accum. protect = .00	-.579	.1700	-.912	-.246	11.610	1	.001	.560	.402	.782
High Level of accum. protect = 1.00	0^a	-	-	-	-	-	-	1	-	-
(Scale)	1^b									

Notes. Dependent variable: a^4 reversed. Model: (Threshold), High level of accumulated risk, high level of accumulated protection: (a) Set to zero because this parameter is redundant; (b) Fixed at display value.

Null Hypotheses H$_0$2: Protective Factors

Based on the results, the second null hypothesis is also rejected. The second hypothesis was "There is no predictive relationship between home, peer, community, and school protective factors, or a combination of such factors, as measured by student reported perception on the PAY survey and student grades as reported on the PAY survey." Again, the likelihood-ratio test as the overall model fit statistically significantly predicted the dependent variable over and above the intercept-only model, $X^2(2) = 86.733$, $p < .001$. This test compared the fit of the model to the intercept-only model giving an idea of the value added. Based on this test, the null hypothesis can be rejected because the overall model fit predicts a relationship. Finally, the null hypothesis must be rejected because of the odds of students with low protection to have high grades is .560, 95% CI [.402, .782] times that of students with high protection, a statistically significant effect, $X^2(1) = 11.610$, $p = .001$.

The same process was conducted using the protective factor data. This data was coded by assigning 0 = Low Protection and 1 = High Protection. Similarly, the dependent variables were coded as 0 = Mostly Ds and Fs, 1 = Mostly Cs, 2 = Mostly Bs, and 3 = Mostly As. Table 14 shows the frequency of participants at low and high overall protection who reported their overall grades as Mostly As, Mostly Bs, Mostly Cs, and Mostly Ds and Fs. Table 14 shows that, out of 805 students, 560 report high protections and only 245 reported low protections. This school had more students who reported high protections than those who reported high risks.

Table 14

High Level of Accumulative Protection

a^4	Low protection	High protection	Total
.00	7	2	9

1.00	38	22	60
2.00	86	151	237
3.00	114	385	499
Total	245	560	805

The results of the test of overall protection frequency were that 69.565% of respondents reported high overall protection while 30.435% of respondents reported low overall protection; 22.222% of respondents who received mostly Ds and Fs reported high overall protection; 36.667% of respondents who received mostly Cs reported high overall protection; and 63.713% of respondents who received mostly Bs reported high overall protection 77.154% of respondents who received mostly As reported high overall protection. The combined data shows that more students with good grades report protections than the students with poor grades.

Table 15

Overall Protection Frequencies

	Frequency	Percent	Valid Percent	Cumulative Percent
Low Protection	245	30.4	30.4	30.4
High Protection	560	69.6	69.6	100.00
Total	805	100.0	100.00	

Assumption Tests Protections

The same assumptions were tested for the second independent variable of protective factors. Multicollinearity testing for protections can be seen in Table 16 which also shows the

results of test of multicollinearity with a Tolerance greater than .1 and VIF less than 10. The

VIF assumption requirement of less than 5 was met with a 1.25.

Table 16

Test of Multicollinearity: Accumulative Protection

Coefficients[a]		
Model	Tolerance	VIF
High Level of accumulative protection	.800	1.250

Note. Dependent variable: a^4 reversed.

The same testing of test for proportional odds, overall model fit, goodness-of-fit, test of

variance, test of intercept only, and parameter estimates were completed for protections and the

results adhered to the same level of analysis and reporting. Table 17 shows the categorical

variable information of both the independent variable and the dependent variable.

Table 17

Categorical Variable Information

Dependent Variable			.0	*N*	Percent
	Ds & Fs		.00	9	1.1
	Cs		1.00	60	7.5
	Bs		2.00	237	29.4
	As		3.00	499	62.0
			Total	805	100.0
Factor	High level of accumulative risk		Low risk	567	70.4

	High risk	238	29.6
	Total	805	100.0
High level of accumulative protection	Low protection	245	30.4
	High protection	560	69.6
	Total	805	100.0

Ordinal Regression Results

Ordinal logistic regression allowed the researcher to predict the likelihood of an ordinal dependent variable based on one or more independent variables. Specifically, it provided evidence as to which, if any, of the independent variables of overall risk and protection level had a statistically significant effect on the dependent variable of self-reported grades. Results of the analysis also provided evidence as to how well the ordinal logistic regression model predicted the dependent variable. This model also included both risk and protections as independent variables predicting grades.

CHAPTER FIVE: CONCLUSIONS

Overview

As the nation continues to grapple with ways to close the achievement gap, many strategies, educational initiatives, and programs will continue to be tried. There are many studies that explore the reasons for the achievement gap; one of the most recent done by Langenkamp and Carbonaro (2018) in which the researchers investigated how student SES affects their math achievement. Although this study looked at environmental influences on student math grades, it does not look at overall academic success. Furthermore, as is the case with this recent study, most achievement gap research looks at low SES schools because it is assumed that the family, community, and peers have a negative impact on student performance because so many schools showing an achievement gap problem come from such environments. However, the previous studies do not look at higher SES schools nor do they investigate the predictability of those environmental risks and protections on grades. This study adds to the current research by investigating the predictability of risk and protection influences on the educational success of students based on their self-reported grades in a higher SES school. The study used archival data from the 2017 PAY survey to look at either positive or negative influences, creating either risks or protections and asked the questions:

RQ1: How accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors as measured by student responses on the PAY survey?

RQ2: How accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors as measured by student responses on the PAY survey?

By looking at the potential predictability of these influences, schools can begin to make more targeted interventions to reduce the risks and increase the protections.

Discussion

The results of this study add to the current literature and research in a few ways. First, this study used the perceptions of high school students. Very few studies have looked at student perceptions to determine what influences have a predictive relationship to their academic success. Wescott (2017) wrote a dissertation that looked at student perceptions of the role of physical education classes on obesity and discussed the need for collecting student perceptions to gain a better understanding of a relationship. Hawkins (2017) wrote a dissertation about African American college students' perceptions of academic advisors and their role in helping students to be successful. These studies understood the need to add student perceptions in order to understand what supports student success, but the purposes of these studies are different. The current study provided new information that supported the needs for research about student perceptions with the purpose of improving student success.

The second way this study added to the research is in its focus on a high-achieving high schools. Although there are recent studies, such as Barr's (2018) dissertation that studied high school students' perceptions of how their high achieving school influenced their selection of colleges, this study was not focused on academic success. However, Barr's (2018) study supports the need to not just research low-performing schools, but also to research high-preforming schools. Very few other studies on high performing schools were found showing that there is a need for more studies of high-achieving schools. The current study added an additional lens to view the needs of a high performing school.

Finally, this study focuses on the relationship between environments and student success in ways that no other study has done. Although some recent studies, such as Short's (2017) dissertation, focused on the influences within school, the research studied high school students' perceptions of their relationship to their student teacher. Short's (2017) study added research to one aspect of the school environment and its relationship to academic success and support the need for studying how environments support or hinder academic success. However, it only looked at one relationship in one of the environments included in this study. The current study focused on a broader scope encompassing several environments with the purpose of informing educational programing to improve student success. This was done through PAYS and by focusing on the two research questions.

The first research question focused on the risk factors and how risk factors can predict student grades. Previous research supported the need to look at risk, but that research has typically has been done by studying "at-risk" students as opposed to risk factors. The literature review found many studies on risk factors, but most were studies around medical risk factors. Bates (2018) did one dissertation study that was situated risk in education. The Bates (2018) study looked at high school dropouts and how protective and risk factors affected student dropout rates. Batten (2016) studied five risk factors that contributed to high school students' eating disorders. Other studies looked at younger student populations, risk and protection factors' relationships to mental health issues, and risk and protection factors' relationships to various health conditions. Each study supports the need to research how risk and protective factors affect students. The current study added one more lens to this topic.

The first research question was how accurately can student grades be predicted based on home risk factors, peer risk factors, community risk factors and school risk factors as measured

by student responses on the PAY survey? The study found that there were fewer students with high risk and that for students with overall low risk, the odds of having better grades is approximately three times that of students with high risk. In other words, students with low risk are much more likely to have better grades. Because the sample was taken from a high income, high-achieving school district, the lower number of reported poor grades makes sense. The demographics of the sample showed highly educated families with higher incomes (see Table 3). According to Davidson (2016), students who come from no college education homes are less likely to be successful enough to go to college compared to those students who come from families with post-secondary education levels. The current study's sample district had the majority of students coming from homes where the average education level was a master's degree (see Table 3). The current study added information about the percentage of predictable relationships of high risk factors as approximately three times less likely to have good grades. This means that students from homes, communities, and peer groups that engage in and have influence over lower risk behaviors are three times more likely to be more academically successful.

The second research question was how accurately can student grades be predicted based on home protective factors, peer protective factors, community protective factors and school protective factors as measured by student responses on the PAY survey? The results for this question showed that students with overall low protection were half as likely as those that have high protections to get good grades. This means that the protective factors found in students' homes, communities, and peer groups have a predictive relationship and if those protective factors are absent, the chances of being more academically successful is about half as good as the chances of their peers who have more protections. This question's results show that protections,

although they have a predictive relationship to grades, are a less powerful influence on student success.

The research showed that the power of low risks was stronger than the power of high protections. This means that schools that want to target supports need to consider targeting the reduction of risks first. This does not mean that increasing protections should not be done. The best results would come from decreasing risks and increasing protections.

Using ordinal logistic regression, this study found evidence that the independent variables of overall risk and protection levels have a statistically significant effect on the dependent variable of self-reported grades. This study also provides evidence as to how well the ordinal logistic regression model predicts grades based on the independent variable of risk and protection. Based on the data, risk and protective factors can predict grades.

As with any research, the contribution it makes depends on how well the research answers a particular question within the parameters of the chosen model. This research can answer the questions about the relationship between risks and protections and students' self-reported grades. Analysis of the data found that there is a predicable relationship between the overall risks and protections and student self-reported grades in a higher SES and higher academic achievement districts. Based on this research, for this district, the findings solidify the assumption that risks have the ability to hinder student achievement and protections have the ability to support student achievement based on student perception. Because the archival data came from a student perception survey, the study added an additional layer of new information based on the unusual aspects of the use of student perceptions and the study being based in a school unlike most of the previous research. As previously mentioned, Yeh (2015) found that the answers to the achievement gap reside in the classroom. Schools need to determine the

various causes and influences that need to be addressed if the school has the responsibility to eliminate the achievement gap. It is also the educational system in each community that must focus on how to reach out to the community beyond the school walls to reach the homes and neighborhoods where risks reside. The school also has the ability and responsibility to build the supports within the school that increase the chances of students being academically successful. Reducing the achievement gap requires that the students who have higher risks and lower protective factors receive supports to clear the way for them to not only learn at their greatest potential, but also to be able to make more than one year's worth of progress and gain ground toward performing at equal levels as their peers. Furthermore, because the gap exists in this and other wealthier, high-achieving schools, this study provided evidence that identifies at least some causes and influences that could be targeted for interventions.

Implications

The nation's achievement gap is arguably one of the most difficult educational problems to solve because of its multifaceted complexity. Large problems are oftentimes best solved by breaking down the issues in order to understand and improve each little contribution to the problem. This research sought to do just that. By asking if there was a statistically significant predictive relationship between the risk and protective factors in the environments (home, community, school, and peer) and student grades, future researchers and educators can stop assuming the relationship and start acting on it. This action, like the interventions, will need to be personalized, individualized, and more than anything, will require that schools get to know and understand the students who are not successful. Schools can use the MTSS process for identifying students who need the support and then use this now known connection to uncover

the risks and provide the supports that could potentially move one student at a time closer to achieving at a level equal to their peers.

For this school, the study gives the administration and teachers some research-based answers about the extent to which risks and protections affect grades. Knowing that students with high risks are about three times less likely to report good grades can inform their next steps in creating their MTSS. This information could inform where to focus the targeted intervention. Understanding that the risky behaviors have a relationship to student success means that some focus must be shifted to include education, supports, and interventions around risky behaviors and not just around academics. Also, recognizing that students with supports are twice as likely to have good grades means that the MTSS also includes the creation of some supports. This means that a dual approach, whereby the school seeks to decrease the risks while also increasing the supports, has the potential to impact grades. For schools, supports could mean providing a positive adult role model, supporting and teaching about positive peer relationship, encouraging and helping students get connected to positive activities that increase their time doing positive behaviors and decrease their time doing risky behaviors. It could also mean creating a better school-to-home relationship. For this district, the research supports the assumption that risks and protections have a relationship on grades and, if addressed, could potentially support the improvement of student achievement.

Another implication lies in the power of adults understanding student perceptions. In their study about MTSS interventions around student self-determination, Shogren, Wehmeyer, and Lane (2016) realized that students' perceptions are powerful and useful for supporting their growth. Understanding and responding to student perceptions can be more powerful than simply assuming that students see things a certain way. A MTSS approach is a school support system

that schools implement in order to ensure that all students have tools they need to achieve at their highest potential. The current study adds validity to creating interventions that increase the chances that risks are reduced and supports are increased based on students' perceptions of those factors and their relationship to the students' success.

Based on the MTSS model, there are three tiers of interventions. The first tier consists of the universal interventions that all students get as supports that are preventative and proactive (Buffum et al., 2012). These supports are typically provided in the classroom through normal interactions and curriculum and are the only interventions needed for 80-90% of students. The second tier of supports is more targeted interventions for those students who did not learn or succeed with their grade level peers. This tier typically picks up another 5-10% of the students (PBIS, n.d.). This second level of support is where schools need to consider working with smaller groups of students to provide more targeted support. The final tier is where 1-5% of the students need more intense and individually targeted interventions (PBIS, n.d.). It is this final tier where a high performing, high SES school will need to create responses focused on the environmental risks and intended as support that are absent in the students' lives. These interventions may need to include other agencies outside of the school as partners with the school to ensure that the risk environment is identified and some educational strategies are implemented based on each individual student's needs. The current study validated the connection between these environments and success. The research provided data that has implications for the school to act upon.

Acting upon the information that this study provided could take many forms. Imagine using a tutoring center whereby teachers identify students who do not achieve after solid classroom instruction and targeted small group reinstruction. The student is assigned to that

tutoring center for more intense and individualized instruction in the content. But, the results of this study shine light on the need for the supports to not stop at the educational content. Based on this research, that same tutoring center could be staffed with a social worker or school counselor who reaches out to the student's home to ensure all the student's needs are being met and that the family has what they need to support their child's learning. Perhaps it also has a peer-mentoring component that supports the student by using strong students to model good, healthy peer relationships, but also good healthy habits of life as well. This same center could be where the struggling student gets encouragement, finds success, gains confidence, and, in the end, makes some changes away from risky behaviors towards more protective choices. Based on the results of this research, this would be targeted interventions based on what students say about themselves that could take one student at a time and move them out of the achievement gap population.

Limitations

The current study is not without limitations. In the process of unpacking the data, several choices were made. The most crucial decision was the decision to use a categorical, rather than a continuous, scale. Using a continuous representation would have been based on the individual risk and protection categories. However, this would have required the researcher to deal with missing data for the students who did not answer some questions. An effort was made at trying a mean replacement within each risk category for each participant. If a participant was missing data for a given risk factor, the researcher entered the overall mean of that particular risk factor as the participant's score. The researcher then created a continuous composite score for each participant. However, the result was that the distribution of the risk factors was incredibly skewed. Given how skewed the distribution of the risk factors was, the researcher decided it was

not the best direction to proceed. The next decision was to decide on whether or not to create

two or three categorical dummy codes (i.e., low risk, average risk, and high risk). It was decided

to use the original overall categorical data shown in Tables 6 and 14.

Internal validity was necessary to be able to draw accurate conclusions. Determining the

internal validity ensures that the data concluded that changes in the independent variable will

also cause the changes in the dependent variable. It is necessary if schools are going to depend

on the study as evidence for changes to their MTSS programs. Using the archival data reduced

the problem that can be associated with extraneous variables during testing because this study

took the overall risk and protective factors as the independent variable and the data showed that

there is a relationship between risk and protective factors over a larger number of questions as

opposed to one question. Additionally, the parameter data (found in Table 13) provided the

researcher with information about the ability to predict the results of one-unit change of the

predictor, provided that all other predictors remained constant. These aspects of the study show

confidence that there is relationship between the independent and dependent variables

External validity needed to be determined to create confidence that the study's results are

applicable to other groups. The PAYS tool has been used for a decade in schools across

Pennsylvania. The tool's validity is discussed in Chapter Three. The ability to apply the results

to other groups of students in other test years and with other grades (6th or 8th) would increase

the power of the results and further suggest that the results are typical.

Finally, based on the limitations and decisions explained above, the predictive power of

risk and protective factors is limited. The predictive power could potentially be stronger if

additional factors such as age, sex, or SES were considered. This limitation is one of the reasons

why two of the model fit statistics for intercept-only model and Pearson goodness-of-fit test indicated that the model was not a great model.

Recommendations for Future Research

Because this research was a first step, future research could be improved by adding a few demographic variables and by comparing other aspects of this survey. Because the PAY survey is conducted every other year with school districts across Pennsylvania, other potential studies could use the same survey to look at ways to individually analyze the individual environments of home, school, peer, and community and see if there is one environment that has a greater predictive relationship than the other environments. As with the assumption that there is a relationship between risky behaviors and grades, there are also assumptions made about the power of family, peers, school, and community influences that affect student success. Furthermore, this survey is powerful because it reports the students' perceptions. Adults most likely perceive peers as the most negative and risky factor, but in reality, it is not clear what students report as the actual factors that cause them the most risk. Furthermore, adults most likely look at home and school as the places most students get their protective factors, but again, more research could validate or disprove those assumptions.

Another suggestion for future research would be to compare a high achieving/SES school district to a lower achieving/SES district. The results and needs of lower achieving/SES school districts may be very different from those of high achieving/SES school districts, requiring a completely different intervention approach. More research that examines high achieving/SES school districts is needed regardless of this survey. Also, because the data is archival, an item analysis could be done to see if there is one item or another that has the greater response that is connected to students who are or are not reporting successful grades.

Because the research on the causes of the achievement gap have typically centered on minority students, the PAY survey could potentially be used to research where minority students might fall compared to their peers. The survey asks students to provide other demographic information that could be pulled to look as this connection. This is a variable that might work to be a more targeted population and to provide the district with some more specific intervention direction for their underrepresented populations including students of color, students with disabilities, and students from the lower SES homes.

Finally, because this study was done using data from a very high achieving district, the sample size for students reporting high and low grades were pretty uneven. Students reporting high grades as defined by mostly As and Bs were reported by approximately 750 students while those reporting mostly Ds and Fs were around 80. Conducting a similar study in a more balanced district whereby an ANOVA is used (because the sample size for each extreme is more balanced) could be done to gain more information about the differences as opposed to the predictive values. This particular survey has many potential directions in which a researcher could gain more information.

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APPENDIX A: Pennsylvania Youth Survey – Passive Parental Permission

Dear XXXX Parent/Guardian:

Our school is taking part in the 20XX Pennsylvania Youth Survey (PAYS) sponsored by the Pennsylvania Commission on Crime and Delinquency, the Pennsylvania Department of Education, and the Pennsylvania Department of Drug and Alcohol Programs. The survey will ask questions about the behaviors of students in the 6th, 8th, 10th and 12th grades, including questions about school climate, violence, depression, bullying, and substance abuse.

The information we receive will assist us and our community partners in working to prevent adolescent drug use and other problem behaviors. We want to ensure that all parents are notified that the survey is being conducted and provide you with as much information about the survey as possible. As a parent, you have the right to prohibit your child's participation. The following facts about the survey will help you make an informed decision about your child's participation:

- Participation in this survey is completely voluntary. Students will be instructed by their teacher that they can skip any questions they do not understand or choose not to answer. If they have any questions or concerns after taking this survey, they are instructed to talk with their school counselor or a trusted adult.
- The survey is designed to protect each student's privacy. It is anonymous and confidential. Students will not put their names on the survey, and no student will ever have their individual responses reported.
- The survey is well tested, having been administered to over 1,000,000 Pennsylvania students since the 1990's. The information collected has proved invaluable to prevention planners in selecting programming to promote healthy youth development.

You can request a list of the survey questions by visiting this link: http://episcenter.psu.edu/node/599. For more information about the survey, including a list of Frequently Asked Questions, please visit www.pays.pa.gov then click on "20XX"

The survey will be administered during the school day October 9-13 and will take one class period to complete. If you do not want your child to participate, please submit your request to [INSERT NAME] in writing by October 2.

Thank you for your help in our efforts to keep our schools drug free and safe for learning. If you have any questions, please contact [INSERT NAME] at [INSERT PHONE NUMBER

APPENDIX B: Classroom Proctor Instructions – Paper/Pencil

THIS SURVEY IS FOR STUDENTS IN 6TH, 8TH, 10TH, AND 12TH GRADES ONLY!

- Some parents may have opted their child out of participating in the survey; your survey coordinator will notify you if any of those students are in your classroom.
- If you need Spanish language forms, please notify your survey coordinator prior to the day of the survey.
- Make sure that each student has a No. 2 pencil. (Students should NOT take the survey using pen.)

(1) On the day of the survey administration, write the School AUN (provided by your Survey Coordinator) on the chalk/white board at the front of the room. Each student will need to write this number on the front of their survey booklet.

(2) READ the following instructions ALOUD to STUDENTS before handing out the Survey Booklets:

- Today we will be taking the Pennsylvania Youth Survey. Your school and community want to hear about issues affecting you.
- This is not a test. There are no right or wrong answers.
- Participation in this survey is completely anonymous; No one will know which booklet or answers are yours. Do not put your name anywhere on the Survey Booklet.
- Answer as many questions as you can and choose the answer for each question that is true for you.
- Participation in this survey is voluntary. If you don't want to answer a question, just leave it blank. If you don't understand a question, you can move on to the next question.
    - Do not to talk to other students during the survey.
    - At the end of class, place your survey face up on my desk. I will seal all of the surveys
    - in an envelope.
    - Any questions?

(3) Hand out the Survey Booklets.
(4) READ the following to your students:
- Write the number listed on the board on the front page of your booklet and fill in the appropriate bubbles.
- Read the cover page and instructions on page 2.
- Answer the questions in this Survey Booklet by marking one of the answer bubbles as shown in the example on the second page of the survey booklet.
- Your answers will be read by a computer, so fill in the bubble completely using a No. 2 pencil. If you want to change an answer, erase the old answer completely.
- Begin!

{Remain at the front of the classroom during the survey to ensure confidentiality. NOTE: because the questions are not in the same order for each student, you should not read the questions out loud.}

(5) At the end of class, place unused surveys into the envelope and READ the following

ALOUD:
- Class is now over. If you have not finished the survey, stop where you are and close the survey.

- As you leave the classroom, place your survey in the envelope.

- Thank you for your participation in this important survey!

  {If you have any questions, please contact your survey coordinator for assistance.}

APPENDIX C: Superintendent's Request for Raw Data

Good morning Ms. XXXXX,

      Per the email exchange below, I am sending this email to you requesting the PAYS raw data for XXXX Area School District. I am actually requesting the raw data for years **2013 and 2015** for inclusive excellence that we are working on for our District. Receiving this information from you would be extremely helpful to view where students feel needs are most specific.

      I thank you in advance for sending both the **2013 and 2015 PAYS raw data** and truly appreciate your help with accessing this information.

Sincerely,

XXXXX

XXXXX
Superintendent of Schools
XXXXX Area School District
131 W. XXXX Avenue
XXXXX, PA XXXXX

APPENDIX D: PRC PAYS Research Proposal Form

Lead Author (name, phone number, email address):

Kathy Pechtold

Co-authors (name, phone number, email address):

Title (provisional):

ACHIEVEMENT GAP: PREDICTING THE EFFECTS OF PROTECTIVE/RISK FACTORS ON STUDENT GRADES

Targeted Journal:

Journal of Counseling and Development

Research Objective(s) Addressed (based on aims/objectives/models/analyses in proposal):

The purpose of this study is to, within the framework of the Socioecological Model, explore which protective and risk factors influence student perceptions of their academic achievement in a high achieving, rural school district.

PAYS [Data set/Wave(s)]:

Survey years 2013 and 2015

Specific Measures To Be Used:

Factor analysis on each year of the survey 2013, 2015 and potentially 2017 T-Test or Repeated measures ANOVA, Multiple Regression Path analysis

Primary Literature Review/Rationale: (Specify the theoretical framework for this study? That is, what theory does it test, or what is the logic that leads one to make predictions regarding the specific model variables that are examined?

Over the past decades, school climate researchers have employed the use of Brofenbrenner's Socioecological Model (1974) as a framework in which the multiple variables influencing

academic success, peer victimization, and various other variables could be explained. More recently, researchers, such as Wang and colleagues (2014) aim to employ complex analysis to determine variable relationships on specific levels within the microsystem of the model such as school level and neighborhood/community level variables. In a recent article, Dorothy Espelage cited the importance of continuing to investigate and explore the relationships, mediating, or moderating role of specific variables within this model. In this study, our aim is to explore risk and protective factors within the microsystem of the Socioecological Model and their relationship to student perceptions of their academic success. Additionally, we aim to investigate the mediating or moderating role of factors within the microsystem on the relationship between student perceptions of school climate and their academic success. The research will help administrators plan for interventions based on factors identified as protective factors.

Hypotheses:

There is a difference between high-risk and low-risk student's perceptions of risk and protective factors for their success.

Incremental Value: How will this paper provide a new and significant contribution above and beyond existing work addressing similar hypotheses or research questions, including earlier work by project investigators, if relevant?

The information gathered in the data will provide explicit numbers specific to State College Area School District to cross reference each data points in an effort to support or refute the hypothesis.
Although there are many articles on school climate and the impact of school climate on academic success, most of the studies on school climate are conducted urban or suburban environments or low SES rural environments. Few studies on school climate have been conducted in high SES, rural environments.

Analytic approach:

Cross reference each question and categorize it based on grade and protective/risk factors of the self reporting students.

Key References Stated in Literature Review/Rationale:

Bronfenbrenner, U. (1974). Is early intervention effective?. *Early Childhood Education Journal*, *2*(2), 14-18.

Espelage, D. L. (2014, November). Using NCES surveys to understand school violence and bullying. In *Prepared for the National Academy of Education's Workshop to Examine Current and Potential Uses of NCES Longitudinal Surveys by the Education Research Community, Washington, DC*.

Wang, W., Vaillancourt, T., Brittain, H. L., McDougall, P., Krygsman, A., Smith, D., ... & Hymel, S. (2014). School climate, peer victimization, and academic achievement: results from a multi-informant study. *School Psychology Quarterly*, *29*(3), 360.

Tasks & Time Frames:

Analysis of raw data over the next year to determine next steps.

Data Security Plan

1. Who will be authorized to have access to the Data (list all):

XXXX XXXX
Kathy Pechtold
XXXX XXXX

2. How will you ensure the data is protected? Specify where the data will be stored?

Data is accessed through a secure site and will be accessed on a password protected laptop computer.

3. Institutional Review Board location, submission, submission date, and approval

The district does not currently have an IRB process.

Please read and sign the Data Use Agreement as part of the PAYS Research Proposal Form

Data Use Agreement

As part of this proposal, I agree to the following:

1. I agree that I will only utilize the PAYS data for the particular project specified above will not transmit any PAYS information to other parties or shared in any fashion. No attempt will be made to identify specific schools, nor will any listing of data at the school level be published or distributed.

2. If the identity of any person or school should be discovered inadvertently, I will notify Dr. Baker (rmb194@psu.edu) immediately of the incident and the identifying information will be safeguarded or destroyed as requested.

3. I agree to respond promptly and in writing to inquiries from the PRC or CRESA regarding compliance with this agreement or the expected date of completion of the research.

4. I agree that I will provide the PRC and PCCD/CRESA with a draft copy for review and comment for any research proposals, reports, or presentations stemming from the analysis of this data prior to their submission, release, or presentation.

5. I agree to destroy all electronic and paper files at a date specified within the data use agreement. (This date will likely depend, in part, upon the complexity of the project, the professional societies and journals to which the data will be reported, and the data retention policy of the institution with which the investigator is associated.)

6. I agree to provide an annual report to the PRC and CRESA, which include:
1. copy of the annual IRB approval for the project
2. update on research progress
3. updated research team members list

7. In the event that I change institutional affiliation during the period covered by this agreement, I will take the following actions before continuing work on PAYS data at the new institution:
1. Inform the PRC prior to relocation
2. Resubmit a data security plan
3. Obtain signed IRB approval from the new institution.
4. Provide assurance that all data files are removed from the original site.

8. I agree to return the data disk at the conclusion of this research to the **Prevention Research Center for the Promotion of Human Development at Pennsylvania State University.**

9. I agree to include in all written reports or other publication, the following statement:

This research is supported by a grant from the Pennsylvania Commission for Crime and Delinquency (PCCD) to the Prevention Research Center for the Promotion of Human Development at Pennsylvania State University. However, findings and recommendations herein are those of the authors and not official statements of PCCD.

Signature _____

Name: XXXX XXXX
Title: Superintendent XXASD
Date: 09/20/2017

APPENDIX E: School Climate/Inclusive Excellence Policy XXXX District

SECTION: PROGRAMS
TITLE: SCHOOL CLIMATE/INCLUSIVE EXCELLENCE POLICY
NUMBER: 100.1
ADOPTED: JANUARY 9, 2017
100.1 SCHOOL CLIMATE/INCLUSIVE EXCELLENCE POLICY

Purpose:
Each District school and program should support and promote teaching and learning environments in which all students can succeed, both academically and socially; have a strong and meaningful voice; and are prepared for democratic life and successful transition into the 21st century workplace. A positive school climate is an essential element of achieving these goals.

The Board of School Directors developed this policy to ensure that every school community member: 1) is treated with dignity; 2) has the opportunity to learn, work, interact, and socialize in physically, emotionally and intellectually safe, respectful, and positive school environments; and 3) has the opportunity to experience high quality relationships. Each shool and program, therefore, has the responsibility to promote conditions designed to create, maintain and nurture a positive school climate.

This policy serves as the umbrella policy for all relevant District policies and sets forth the Board's expectations for inclusive excellence, serves as a framework for the District's climate improvement process, and reflects principles set forth in the National School Climate Standards. Definitions School Climate is a broad, multifaceted concept that involves many aspects of the student's educational experience. A positive school climate is the product of a school's attention to fostering safety; promoting a supportive academic, disciplinary, and physical environment; and encouraging and maintaining respectful, trusting, and caring relationships throughout the school community.

A sustainable, positive school climate fosters the development and learning necessary for a productive, contributing, and satisfying life in a democratic society. In a positive school climate:
- Norms, values and expectations support people feeling socially, emotionally and physically safe.
- People are engaged and respected.
- Students, families and educators work together to develop, live, and contribute to a shared school vision.
- Educators model and nurture attitudes that emphasize the benefits and satisfaction gained from learning.
- Each person contributes to the operations of the school and the care of the physical environment.

(This definition of a positive, sustainable school climate was adapted from the definition consensually developed by the National School Climate Council.)

Inclusive Excellence is the understanding that working, living, and learning environments benefit when diversity in thought, learning, and personal characteristics is recognized and utilized.

Inclusive Excellence helps us to engage in civil conversation with those who hold views that differ from our own; and to socialize with persons who have had different life experiences. In both class and field experiences, inclusive excellence is addressed through ample opportunities to learn about diverse cultures, both locally and globally.

Expectations:

All XXXX Area School District (XXXXX) community members deserve a respectful environment in which the diversity of their experiences and background is understood, valued, and contributes to a positive environment and a successful experience for everyone. In addition, XXXX shares responsibility for preparing students to succeed in a racially and culturally diverse world.

The Board of School Directors is committed to promoting and sustaining culturally proficient schools, central offices, and school community support systems in order to create a climate of inclusion in which all individuals feel respected, are treated fairly, and are provided opportunities to excel. It is the intent of the Board that staff and students throughout the XXXXX work and interact in schools and classrooms that affirm diverse backgrounds, acknowledge the disparity of outside opportunities related to students' socioeconomic status, and promote appropriate educational experiences in learning options, achievement, and discipline.

Students will develop the capacity to recognize when preconceptions, attitudes, or incidents compromise the school climate; they will be equipped with the knowledge and strategies to respond effectively and appropriately; and they will understand and accept responsibility for their role in contributing to a positive school climate.

To create and sustain an environment of Inclusive Excellence, the Board establishes the following strategies:
- Educating students for life and for reflective democratic citizenship; all students will be prepared to succeed in a racially and culturally diverse local, national, and global community.
- Preparing students to engage with others in diverse community and work settings through skills and competencies in effective listening and communication, leadership, collaboration, participatory deliberation and problem solving.
- Ensuring that every student has access to high quality, culturally relevant, and responsive curriculum and instruction.
- Ensuring that policies, procedures, and practices result in equitable access for all students.
- Ensuring that our student discipline system: balances the needs of the school community with those of the individual student; includes supportive disciplinary practices; preserves the integrity of the learning environment, and addresses the causes of a student's actions in order to improve behavioral skills and long-term outcomes.
- Listening to, encouraging, and valuing student voice as an essential resource and component of this policy.
- Providing a safe environment for crucial conversations among students, between students and teachers, and for all staff.

- Ensuring cultural proficiency in among District staff so that every adult exhibits the ability to understand cultural differences and effectively interact with a diverse population. Professional development, staff evaluation and other support activities will assure that our teachers demonstrate culturally responsive pedagogy, assessment, teaching strategies and practice, and the capacity to effectively facilitate controversial issues and uncomfortable classroom discussions.
- Creating and maintaining a process that supports the sustainable recruitment, hiring, training and retention of educators who have a strong commitment to understanding, and the skills to address, a diverse student population.
- Fostering welcoming environments in all schools and offices that reflect and support the diversity of the population served.
- Ensuring that students, parents, teachers and community members have a clear and accessible mechanism for expressing their concerns and that they receive a prompt and appropriate response.
- Developing and maintaining strong partnerships with the community.
- Assessing implementation of this policy on a regular basis through the use of appropriate tools such as student, staff, and parent surveys, and reporting on the state of school climate to the public.
- Committing appropriate resources in order to implement and sustain these strategies.

Delegation of Responsibility:

The Superintendent shall designate a district coordinator to be responsible for overseeing the implementation of this School Climate/Inclusive Excellence Policy. In addition, each applicable administrator shall be responsible for leading a School Climate Committee that develops a plan designed to support continual improvement in the school's climate. This plan will constitute a continuous cycle of preparation, evaluation, action planning, and implementation. On an annual basis, or more often if appropriate, the administration will report to the Board and the community the progress that has been made on these initiatives.

APPENDIX F: Institutional Review Board Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

August 28, 2018

Kathleen Pechtold
IRB Application 3449: The Achievement Gap: Predicting the Effects of Protective/Risk Factors
on Student Grades

Dear Kathleen Pechtold,

The Liberty University Institutional Review Board has reviewed your application in accordance
with the Office for Human Research Protections (OHRP) and Food and Drug Administration
(FDA) regulations and finds your study does not classify as human subjects research. This means
you may begin your research with the data safeguarding methods mentioned in your IRB
application.

Your study does not classify as human subjects research because it will not involve the collection
of identifiable, private information.

Please note that this decision only applies to your current research application, and any changes
to your protocol must be reported to the Liberty IRB for verification of continued non-human
subjects research status. You may report these changes by submitting a new application to the
IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether
possible changes to your protocol would change your application's status, please email us at
irb@liberty.edu.

Sincerely,

Administrative Chair of Institutional Research
The Graduate School

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