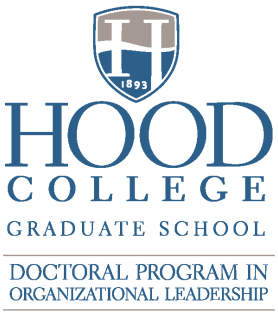

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Statement of Academic Integrity

I certify that I am the author of the work contained in this dissertation and that it represents my original research and conclusions. I pledge that apart from my committee, faculty, and other authorized support personnel and resources, I have received no assistance in developing the research, analysis, conclusions, or text contained in this document, nor has anyone written or provided any element of this work to me.

Signed:

_____ _____

Joel Beidleman Date

HOOD COLLEGE

School Psychological Safety:
A Quantitative Analysis of Maryland Middle Schools

A DISSERTATION

Submitted to the Faculty of the
Graduate School of Hood College
In partial fulfillment of the requirements
for the degree
Doctor of Organizational Leadership

by
Joel Beidleman

Frederick, Maryland

2021

Doctoral Committee

The members of the committee appointed to examine the dissertation of Joel Beidleman find that this dissertation fulfills the requirements and meets the standards of the Hood College Doctoral Program in Organizational Leadership and recommends that it be approved.

Jennifer Cuddapah, Ed.D., Chair Date

Keith Harris, Ed.D., Member Date

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DEDICATION

To my two sons, Dillon and Dean Beidleman. As you move throughout life remember to strive for excellence in all things and follow your dreams with perseverance and tenacity.

Love, your Dad

School Psychological Safety: A Quantitative Analysis of Maryland Middle Schools

Joel Beidleman

Committee Chair: Jennifer Cuddapah, Ed.D.

ABTRACT

This correlational study of 234 Maryland middle schools investigated the association between psychologically safe school environment scores, based on perceptions of students, and their literacy achievement. Student responses on the Maryland School Survey were used as the measure of psychologically safe school environment (PSSE). The association between PSSE scores and students' literacy, using state language arts assessment results, was investigated at three levels: PSSE and overall literacy achievement, PSSE and literacy achievement of economically impacted students, PSSE and literacy achievement of non-economically impacted students. An economic moderator, economics of school attendance area by school zip code, was investigated to determine if it strengthened or weakened the correlation between the two variables. Students typically come from adjacent zip codes. The assumption was that the economic moderator, based on the school's physical location, represented more or less economic resources which impact student achievement. A moderated multiple regression model was used to account for PSSE scores and the product of PSSE and the economic moderator. After completing statistical tests, trends, patterns, and variance were examined. A moderated multiple

regression model revealed that PSSE had a 35% unique contribution to the variance in overall literacy achievement. It was also discovered that PSSE displayed a 30.1% unique contribution to the achievement of economically impacted students and 30.8% of non-impacted students. This research moved beyond the identification of economically impacted student groups to reveal school psychological safety is associated with higher levels of achievement. Recommendations are made on how to use the PSSE scores to improve school environments, identify areas of improvement, and explore characteristics of schools with high psychologically safe school environment scores. Recommendations for future research include using available school data to investigate programs, partnerships, or other resources supporting school psychological safety. This study provided statistical data with interpretations on Maryland middle schools in hopes researchers will seek out identified schools and uncover practices to increase psychological safety and, ultimately, academic success for all students.

CHAPTER 1 INTRODUCTION

In 1926 in White Sulphur Springs, Virginia, a 6th grader named Katherine Johnson was selected to move up a grade to 9th grade because she demonstrated the ability to solve complex mathematic problems. She went on to be one of the greatest mathematicians at NASA and penetrated the glass ceiling for women and people of color (Washington, 2019). This example conveys that middle school educational years are critical; during that time, students experience rapid physical, cognitive, and social change.

After being an educator at the middle school level for over two decades, I believe our ability to inspire and make middle school students feel safe in their academic environment can change their lives forever. Thus, it is important to understand the relationship between how students perceive psychological safety within their school and how this perception correlates with their academic achievement. Schein (1985) argued there is an association between school psychological safety and the proficient literacy achievement of students. He measured safety of the school environment using a psychologically safe school environment (PSSE) score. Converse to experiencing safe environments, children in poor school climates may observe adult practices that disconfirm their expectations and hopes for meeting academic benchmarks (Schein, 1985). Climate surveys completed in schools have been used to measure perceptions of a school's social-emotional and physical characteristics that potentially influence academic development (Cohen et al., 2009; Voight & Hanson, 2017).

In 2019, Maryland students rated their physical safety a 3.5 on a scale of 1 to 10 and their emotional safety a 5.4, on a scale of 1 to 10, with 10 being the best score (Maryland State Department of Education [MSDE], 2019). This study demonstrated that economically impacted students benefitted greatly from psychological safety at school. Economically impacted students

include those who receive free and reduced meals due to their family's need for support for basic economic needs (Hagenaars, 2014). Economically impacted students often are forced to overcome challenges such as defensiveness or learning anxiety that can mitigate academic success in school (Schein, 1985).

Sherman & Cohen (2006) suggested that unsupportive environments adversely affect academic achievement, mental health, and physical health. Due to comparative differences between the achievement of students of color and their peers, race has received attention within the education community (Rothstein, 2013). The term, *achievement gap,* was coined by educators to bring attention to discrepancies in the average achievement by students of color compared to their White peers. Underachievement of students is often aligned to disproportionality in educational services attributed to race and the impact of desegregation during the civil rights era (Rothstein, 2013).

In Earthman's 2002 research, factors influencing low achievement included poor building conditions such as lighting, classroom configuration, noise reduction, and temperature. Similarly, Orfield and Lee (2005) conducted a study in Boston, Massachusetts, with public schools in which they argued that student underachievement is due to segregation and inequalities in facilities.

The present study examined PSSE constructs using archival data from the 2018–2019 school year from over 200 middle schools in Maryland. In Maryland, a psychologically safe school environment, as perceived by students, can be identified using the Maryland Student Survey created by the MSDE in collaboration with experts at the Mid-Atlantic Regional Educational Laboratory. The survey used a 4-point Likert scale with the following responses: *strongly agree*, *agree*, *disagree*, and *strongly disagree*. Middle school students in Grades 6–8

took the Maryland Student Survey which measured four domains: safety, environment, engagement, and relationships (MSDE, 2019). Overall student achievement was investigated as well as achievement for economically impacted students as they relate to a psychologically safe school environment. This study adds to the literature on school psychological safety and provides specifics on how schools can facilitate a psychologically safe school environment.

In summary, the study used data from the Maryland Student Survey and the U. S. Census Bureau to statistically test for associations between psychologically safe school environments (PSSE) and the literacy achievement of three groups within Maryland middle schools. The groups included overall literacy achievement (OLA), economically impacted literacy achievement (EILA), and non-economically impacted literacy achievement (NILA).

Statement of the Problem

The problem for this study is that there are stressful or traumatic childhood experiences that can have a negative psychological impact on children during middle school years. If a psychologically supportive environment is not available, school experiences can increase the risk for medical challenges such as those included in Adverse Childhood Experiences (Brown et.al, 2009). Determining the appropriate interventions to employ to eliminate or mediate these experiences has become increasingly challenging. Research has shown that economically impacted students have higher probability of exposure to variables that weaken achievement such as observing or being involved in violence, experiencing adolescent childhood trauma, and lacking resources available to their peers (Haberman, 1995). Challenges associated with poverty can be exacerbated when there is a high concentration of low-income families in a school's attendance area (Simons et al., 2004; Wilson, 1997).

Nearly 50% of children in poverty witness violence with higher levels of stress caused by either community violence, family drug use, or isolation (National Scientific Council on the Developing Child, 2010). Earlier research brought attention to the discrepancies in the achievement of students living in poverty and described elements of what is now termed the *economic gap* in that family background factors influence children's educational attainment more than short-term credit constraints (Carneiro et al., 2003). Darling-Hammond et al. (2014) suggested that an unintended consequence of No Child Left Behind (NCLB) includes increased emphasis on test-based rote instruction particularly in schools struggling to raise the scores of low-income students of color they serve. Student-centered and personalization practices that encourage leadership, character, and social emotional learning are more often in schools that serve affluent and middle-class students (Darling-Hammond et al., 2014). Uncovering schools with practices that influence the achievement of economically impacted students will assist others in identifying appropriate programs and learning frameworks.

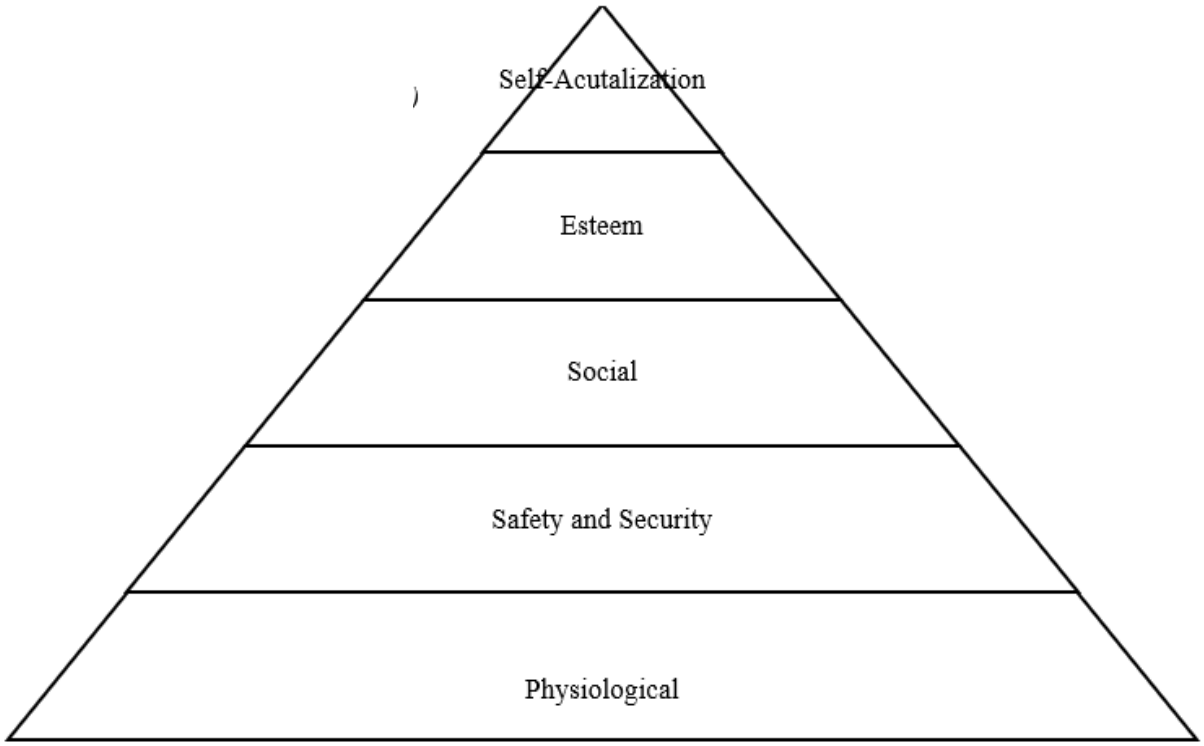
Theoretical Framework

If people do not feel safe in their environment, they will seek to find safety before they attempt to meet any higher level of survival beyond physiological needs, air, water, food, rest, and health (Maslow, 1943). The theoretical framework for this study is based on Maslow's (1943) hierarchy of needs. The framework rests on the idea that human needs are categorized into a hierarchy of five different levels as depicted in Figure 1. This study assumes that students' basic physiological needs are met (Maslow level 1) and focused on psychologically safe school environments that provided safety needs (Maslow level 2). According to the theory, ensuring safety needs are satisfied will move students to higher levels on the hierarchy thereby creating more human connections. Maslow (1943) believed all behaviors are driven by needs and those

needs are pursued in a hierarchical fashion. The pursuit suggests that higher level needs are contingent on the lower-level needs being met.

Figure 1

Maslow's Hierarch of Needs



Note. Figure taken from Maslow (1943).

Maslow's levels were designed in a pyramid with the concept of each previous level being sufficiently satisfied before emerging upward into the next level (Hooper, 2019). As people progress up the pyramid, needs become increasingly psychological and social. Maslow believed that these needs are similar to instincts and play a major role in motivating behavior. Physiological, security, social, and esteem needs are deficiency needs, which arise due to deprivation. The need for safety is especially important for children who thrive in predictable environments and can react with emotional fear when their need for safety is not met (Hooper,

2019). Economically impacted students commonly come from homes where guardians or parents provide twice as many reprimands as positive comments, compared with a 3:1 ratio of positives to negatives in middle-class homes (Hart & Risley, 2006).

To support economically impacted students, Jensen (2013) suggested the need for a strong, positive, caring adult. Maslow (1943) cautioned that students will attend to safety before attending to any other need if they have experienced a natural disaster, family violence, childhood abuse, institutional racism, post-traumatic stress disorder, or transgenerational trauma. To increase the statistical probability of economically impacted student achievement, the psychological practices performed in school environments where achievement has been positively impacted should be examined.

The Maryland Department of Education

Research that states economically impacted students have higher probability of exposure to mitigating variables (Haberman, 1995), makes it increasingly difficult to determine the appropriate interventions to employ. This study attempted to uncover practices of middle schools in the state of Maryland that enhance the learning environment and influence the proficient literacy achievement of economically impacted students. Maryland is one of the first states to develop a school climate index for accountability, and its experience might serve as a helpful example for state education agencies looking to incorporate survey-based measures into their statewide accountability plans under the requirements of Every Student Succeeds Act.

For over 200 years, Maryland has discovered ways to provide economically disadvantaged students with access to free education. As early as 1695, the state attempted to establish free public schools by assessing tax on exports. The first free school was established in Annapolis, the current capital of the state, with 12 additional schools in various counties opening

in 1723. In the early stages of development, governing boards were appointed, instructed to purchase centralized land, and provide education to as many economically disadvantaged students as possible (Maryland State Archives, 2020). In 1812, the state began to raise money for a Free School Fund by taxing the renewal of bank charters (Maryland State Archives, n.d.). Legislation followed in 1816 that provided for nine commissioners of the school fund in each county to distribute the Free School Fund (Chapter 256, Acts of 1816). Realizing that fund monies would not be sufficient, counties requested the first property tax assessment to pay for the education of poor children (Maryland State Archives, n.d).

More recently, enrollment in Maryland schools varies slightly to the actual demographics of the population within the state; for example, the percentage of African American people in Maryland is 31.1% compared to the enrollment of African American students its public schools which is 33.7%. Table 1 provides information on the disaggregated enrollment of Maryland schools by race.

Table 1

Maryland School Enrollment by Race

Total Students	American Indian/Alaska Native	Asian	Black/African American	White	Hispanic	Native Hawaiian/Other Pacific Islander	Two or More Races
893,689	2387	58823	301542	333552	155346	1300	40,739
%	0.3%	6.6%	33.7%	37.3%	17.4%	0.1%	4.6%

Note. See complete the 2017 disaggregated enrollment for Maryland Schools in Appendix A.

In 2009, Maryland was ranked first in the nation in achievement, according to separate independent studies conducted by Education Week, Newsweek, and MGT of America. According to the World Report by U.S. News (2019), Maryland ranked eleventh for K-12 education. According to the Maryland Report Card for the 2018–2019 school year, the reported attendance rate for Maryland schools was 93.5% and the graduation rate was 86.9%.

Currently, the MSDE, which operates in 23 counties and one city (Baltimore City), is a division within the state government of Maryland. According to MSDE, in 2019, the state had an enrollment of 893,689 students and operated 1,428 schools. The Maryland county with the smallest district enrollment was Kent County, and the largest three districts were Baltimore County (113,282 students), Prince George's County (132,322 students), and Montgomery County (161,546 students). Table 2 displays the number and level of schools for the state of Maryland during the 2019 school year.

Table 2

Number of Schools Within Maryland in 2019

Total Schools	**Elementary**	**Middle**	**High**	**Combined**	**Special Education Centers**	**Charter**	**Alternative/ Technical**
1,428	781	212	180	93	37	50	64

Note. See complete enrollment for Maryland Schools by district Appendix B.

The MSDE is led by the state superintendent with governance by the state board of education, and together they develop policy, regulation, and governance over the education within the state. Maryland's school demographics allow for schools in some areas to promote cross-racial understanding and promote learning in an environment that resembles an increasingly diverse work society (Goodman, 2008). Table 3 displays enrollment for Maryland schools during the 2019 school year with percentages of students in special categories.

Table 3

2019 School Enrollment by Category

Total Students	Students with Disabilities	FARMS	English Learners	504	Homeless
893,689	11.7%	42.3%	10%	4.0%	1.5%

Across the years, Maryland invested in teacher development and educational research. It broadened fiscal budgets to improve facilities. As an educational system, the state also provided grants and other funds for interventions for struggling schools and to increase the learning of economically disadvantaged students.

Purpose of the Study

The purpose of this study was to identify middle schools in the state of Maryland with high ratings of psychologically safe school environments and investigate the influence of aspects of the environment on achievement of middle school aged children—particularly economically impacted students. The psychologically safe school environment (PSSE) score incorporates student perceptions of emotional safety, physical safety, physical environment, bullying, and teacher-to-student relationships. The PSSE score was taken from the Maryland Student Survey provided to students in the spring of 2019.

This research moved beyond just identifying economically impacted student groups and sought to demonstrate whether psychologically safe environments were correlated to higher levels of literacy achievement. Recommendations were made on how to determine the PSSE score, identify associated literacy achievement data, and explore extreme data points for schools that demonstrated literacy achievement associated with psychologically safe school environments. The study included data from 234 middle schools within the state of Maryland. An economic stratum was used for schools to provide comparative analyses based on economics.

Additional information on specific programs, partnerships, or other resources of the schools that support psychological safety are recommended for future research. This study provides interpretations of statistical data on Maryland middle schools with hopes that the

research will drive researchers to seek out identified schools and uncover practices to increase the likelihood of psychological safety for students.

Research Questions and Hypotheses

Secondary data from the MSDE, including Maryland School Survey data and results of the Maryland Comprehensive Assessment Program (MCAP) were analyzed to answer the following research questions:

- **Research Question 1 (RQ1):** What relationship exists between psychologically safe school environments (PSSE) and literacy achievement? Does the strength of the relationship differ for economically impacted students compared to their non-impacted peers?
- **Research Question 2 (RQ2):** How does the effect of psychologically safe school environments on literacy achievement vary based on a school's economic stratum?

Given the purpose of the study and the research questions, the following hypotheses were examined:

- **Hypotheses to address RQ1:**
    - H1A: There is a correlation between overall PSSE scores and literacy achievement scores of all students.
    - H1B: There will be a correlation between PSSE scores and literacy achievement scores of economically impacted students.
    - H1C: There will be a correlation between PSSE scores and literacy achievement scores of non-economically impacted students.

- **Hypotheses to address RQ2:**
    - H2A: Economic stratum will moderate the relationship between PSSE on literacy achievement.
    - H2B: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically impacted students.
    - H2C: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically non-impacted students.

Overview of Methodology

This study of Maryland middle schools used an analytical quantitative design. More specifically, it was a correlation study to determine if there was an association between psychologically safe school environments (PSSE) and (a) overall literacy achievement (OLA), (b) economically impacted literacy achievement (EILA), and (c) non-impacted literacy achievement (NILA). An economic moderator (ECOZ), the economics of school attendance area by school zip code, is considered as it may influence achievement in schools based on access to or lack of resources. It is common for students to come from a variety of adjacent zip codes; however, this study argues that the economic moderator of the physical site where the school resides may influence the relationship.

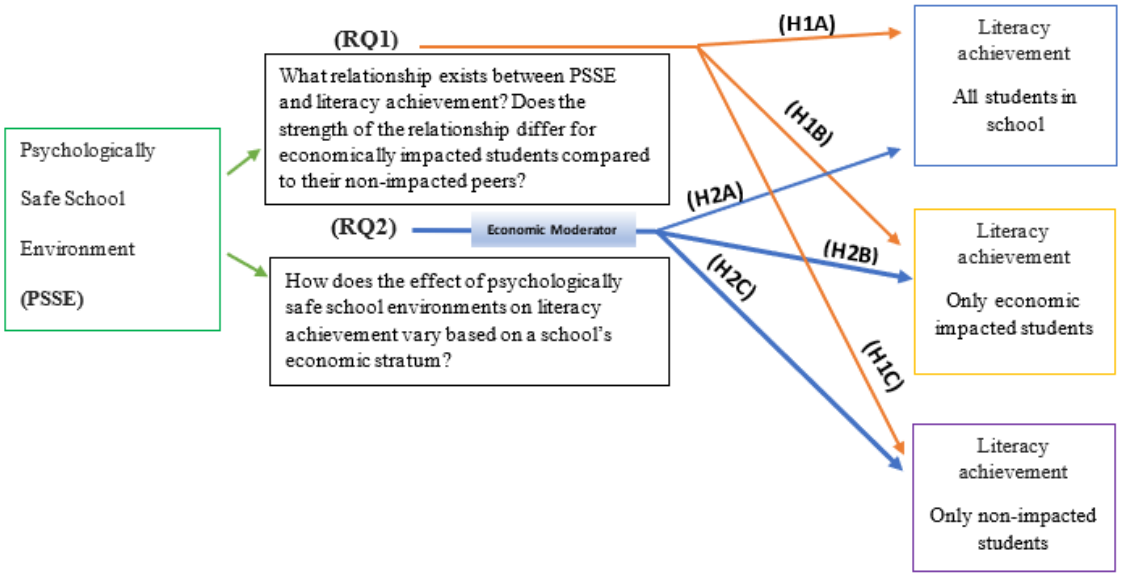
Moderated multiple regression (MMR) statistical tests were used to explore the independent and dependent variables for associations among them. The statistical test used the economic moderator to account for the strengthening or weakening of the effect on access to economic resources. After completing statistical test data, the study examined for trends, patterns, and variance. Graphical representations and tables were used to create visualization

tools to accentuate levels of PSSE and any associations with literacy achievement for three different groups within schools in the sample.

The independent, dependent, and control variables are shown in Figure 2, the Concept Map for the research. An economic moderator by school zip code (ECOZ) that may influence achievement in schools based on access to resources is also included.

Figure 2

Concept Map



The Statistical Package for the Social Sciences (SPSS) was used to analyze the PSSE scores and test for correlations to the dependent variables (Pallant, 2016). SPSS was used to run descriptive statistics for each variable as well as three moderated analysis using MMR tests. Preliminary analyses ensured no violation of the assumptions of normality, linearity, multicollinearity, or homoscedasticity. This study used data reported by the U. S. Census Bureau (n.d.) on several different factors including the economics of the school's attendance area because this research focused on the influence of PSSE particularly on economically impacted students.

The PSSE score was based on student responses on the Maryland School Survey developed by the Maryland State Department of Education (MSDE, 2019a) in collaboration with experts at the Mid-Atlantic Regional Educational Lab (MSDE, 2019a). The survey responses provided the basis for the school score for PSSE, a requirement of the Protect Our Schools Act of 2017 (Maryland State Education Association, 2017). Middle school students in Grades 6–8 took the survey which measured four domains: safety, environment, engagement, and relationships. All responses used the same 4-point Likert Scale of *strongly agree, agree, disagree*, and *strongly disagree*. Schools earned a maximum of 7 points for students (MSDE, 2019a). Results were included in the accountability system, and a school survey score was reported to schools and published on the MSDE website.

Literacy achievement data were pulled from the MSDE website (MSDE, 2019a) in the form of the percent proficiency in literacy on the MCAP for schools. The survey was field tested statewide during fall 2018 which allowed the study team to examine the properties of the survey and adjust the survey instruments to ensure sufficient reliability and validity. The study team confirmed the reliability and validity of the ultimate survey by conducting similar validation exercises using data from the spring 2019 operational survey administration.

This study used Maryland Student Survey data from spring 2019 operational survey administration (MSDE, 2019a). This quantitative study examined data on Maryland middle schools to identify schools that may have been able to overcome patterns associated with underachievement for economically impacted students and to shed light on their practices and common beliefs regarding these schools for future research.

Significance of the Study

The middle school educational years are critical to development of students experiencing rapid physical change, cognitive development, and peer acceptance needs. Students at this age also develop a sense of social relationships, incorporate concepts around self- identity, and operationalize their own ethical code of morality (Eccles & Midgley, 1989; Jackson & Davis, 2000). How students respond to and accept the variety of influences, both positively and negatively, may play a key role in their educational development. The research on the effect of adverse childhood experiences has awakened educators about how students in middle school demonstrate a variety of psychological responses stemming from traumatic experiences in early childhood (Burke et al., 2011). Researchers furthered the discussion on adolescent trauma by presenting quantitative data on a sample from the Chicago Longitudinal Study (CLS). The study conducted by Mersky et al. (2013) tracked development of a cohort of racial and ethnic minorities in economically impacted communities and found that nearly four out of five of the CLS study participants had at least one ALE.

Recognizing the presence of trauma of adolescent children, I analyzed school data on psychological safety to identify schools with best practices. As a result, educators can use the results of this study and identify and gain access to more psychologically safe practices to enable students to increase their rate of learning. The PSSE scores revealed a story of students feeling safe to enable them to employ themselves in tasks without fear of negative consequences stemming from peer image, academic status, or teacher judgement (Kahn, 1990).

Limitations

The sample was limited to the population of all public middle schools with the exclusion of charter, magnet, and schools with insufficient data on the MSDE website. For consistency, the

study excluded various private and special schools, academies, technical schools, special needs' schools, and schools with data not reported. Schools with enrollment less than 5% for either the economically impacted or non-economically impacted subgroup were excluded due to data not reported by MSDE.

The study was limited to the correctness of the reported data on the Maryland State Report Card. In this data set, the economically impacted subgroup could be overrepresented in some areas where the majority of the population has been identified as eligible for free and reduced meals (FARM) program causing the State to approve the entire school for representation as low income. Another consideration regarding economics is that the state of Maryland has been in the top two states or territories for highest median household incomes for the last 5 years (U.S. Census Bureau, 2019). In other areas, the data were underrepresented due to the application process and some parents deciding not to complete the application process. Survey data from one school year was used to measure the psychologically safe school environment construct.

Definitions

Table 4 includes key terms and definitions used in this research.

Table 4

Key Terms and Definitions for Research

Definition	Description of Term as Used in Research
Economically Impacted	All students within this subgroup have been identified by their local school district as eligible to receive free or reduced-price meals through direct application. A student's household income must not exceed 185% of the federally designated poverty threshold for a comparable size family living in a similar geographic area (U.S. Department of Agriculture, Food and Nutrition Services, 2015).
Psychological Safe School Environment (PSSE) score (Independent Variable)	School score will be based on a survey by the MSDE in collaboration with experts at the Mid-Atlantic Regional Education Lab. All responses will use the same 4-point Likert Scale of *strongly agree, agree, disagree*, and *strongly disagree*. Middle school students in Grades 6–8 take the survey which measures four domains: safety, environment, engagement,

Definition	Description of Term as Used in Research
	and relationships. A school can earn a maximum of 7 points for students (retrieved from www.MarylandPublicSchools.org)
Psychological Safe School Environments (PSSE)	The environment that supports students to overcome defensiveness, or learning anxiety, that can occur when they are presented with content or verbal statements that disconfirm their expectations or hopes (Schein, 1985). The ability for each student to demonstrate oneself without fear of discipline or negative peer comments to self-image, peer status, or teacher reprimand (Kahn, 1990).
Literacy Achievement (Variables OLA, EILA, and NILA)	Literacy achievement is measured by the percentage of students scoring proficient or higher on the Maryland state assessments in English Language Arts. The percentage of students scoring proficient or higher on state standardized English Language Arts tests will be used as the dependent variable. On state assessments for English Language Arts, proficient or higher is Performance Level 4 or 5. (retrieved from www.MarylandPublicSchools.org).
Economic Moderator for School Attendance Area (Moderator Variable ECOZ)	In a causal relationship, if x is the predictor variable and y is an outcome variable, then z is the moderator variable that affects the casual relationship of x and y. Most of the moderator variables measure causal relationship using regression coefficient. The moderator variable, if found to be significant, can cause an amplifying or weakening effect between x and y.

CHAPTER 2 LITERATURE REVIEW

The analysis of literature focused on the variables associated with the research questions, hypotheses, and work pertaining to the subject of psychological factors that influence academic success by students. Topics in this review that were related to the first research question, RQ1, and its hypotheses included: regulations on school safety, political mandates, student perception, and literacy achievement. In researching psychologically safe school environments, other factors were suggested that may also influence student achievement including economics, high expectations for student achievement, frequent evaluation of student progress, a safe and orderly school climate, and educational leadership (Reynolds et al., 1996).

To address the second research question, RQ2, the study design included the use of an economic moderator defined as the median income of participating school's attendance area. This moderator was included to determine if there was variance in student achievement based on the economics of school attendance areas. The identification of economically impacted students, adverse experiences associated with poverty, and the effect poverty has on student learning were considered in addressing RQ2.

This literature review recovered documents published after 2000 and included relevant articles and texts on seminal work in the field of psychological safety with earlier publication dates. Several online research engines including EBSCO, Google Scholar, and peer-reviewed article databases provided research on the context of educational issues on race, historical accountability systems for education, and the school climate of middle school education for students. Research conducted by the U. S. Census Bureau as well as the MSDE provided support in building the foundation of learning concerning the student survey, state economics, student achievement levels, demographic enrollment, and school attendance. In this literature review, the

main focus was on the construct of psychological safety, factors of psychologically safe school environments aligned with the reported data from the MSDE student survey, identification process of identification of economically impacted students, and student achievement as measured by literacy proficiency.

Finally, connections were provided on the impact of psychologically safe environments on literacy performance. Furthermore, the study also characterized the psychological safety of students as a whole-school construct rather than individual student perceptions. Attention was also given to the rise in interest of mental and emotional health of students and the connection to increased levels of academic achievement. This literature review is divided into the following sections: safety, school accountability, political mandates, literacy achievement, student perception, PSSE, and economic impact.

Safety

Common definitions of safety requirements grew with research from the Advisory Committee on Safety in Nuclear Installations (1993). After the nuclear accident in Chernobyl, governing entities gave attention to human factors by creating new regulations, practices on safety, training procedures, and requirements. These changes demonstrated that traumatic events that impact people, such as Chernobyl, can have an effect on policy and bring change (Burstein, 2014).

In the winter of 1948, the United Nations adopted the Universal Declaration of Human Rights, within these rights the concept of safety is listed throughout the document as a universal right for all humankind (United Nations General Assembly, 1948). At the cornerstone of every governing country, safety is mandated, and within the United States Constitution, safety regulations on a variety of topics including work environment, driving, receipt of medical

attention, education, and law requiring states to create groups to govern the implementation of federal expectations (U. S. Archives, n.d.).

In recent years, more attention has been given to the mental health of employees with research questions focused on the influence of mental health on performance. In 1998, the state of Maryland implemented the Mental Health Parity and Addition Equity Act which set forth regulations to organizations with 50 or more employees. The act stated that organizations had to provide the same benefits for mental health as physical benefits (msba, n.d.). On December 13, 2016, President Obama signed the 21st Century Cures Act which established governance over the mental health of employees at the federal level that included programs, accountability, committees, and a federal position of assistant secretary for mental health (U.S. Food and Drug Administration, 2020).

Kreworuka (2020) wrote about Hope Rubito, 16, now receiving a student leadership award, who spoke out about her middle school years. In the article, the teen commented that she was approached in middle school and told that she was too fat and should kill herself. She credits her teacher who had a gut feeling about her change in behavior and reached out to her parents. Hope wanted to commit suicide and the communication between her teacher and parents prevented a tragedy. Specifically, the teen stated, “She [her teacher] saved my life.” Middle school can be a difficult emotional time for students and a critical time for bullying (Harris & Hathorn, 2006).

Olweus (Olweus 1993) provided a definition of two forms of bullying observed in schools. Direct bullying involves physical or verbal attacks from one student to another. Indirect bullying involves groups of students who exclude or socially isolate students. In literature, bullying has been defined as hostile aggression, recurring over a period time, deliberate, and

without baiting the victim (Harris & Petrie, 2002). As students move from concrete to abstract thinking in their cognitive development, they are more aware of the nuances of social relationships. As changes in technology have allowed for more opportunities for communication, accessibility to receive harmful messages has also increased (Kowalski et al., 2012). As a result, in the middle school years bullying may shift from direct physical instances to more subtle forms of verbal, relational, as well as sexual bullying (Cunningham & Whitten, 2007).

Bullying involves an imbalance of power that is generally repeated over time (Olweus, 1993; Sherer & Nickerson, 2010). Although this study focuses on PSSE and its impact on economically impacted student achievement, research suggested that bullying has an immediate impact on students (Haynie et al., 2001; Juvonen et al., 2003). Students who experience or observe bullying also play a role in the breakdown of PSSE. These students use reactive behaviors in response to being victimized. Their academic achievement is impacted, and they may exhibit conduct problems and limit opportunity to build relationships (Haynie et al., 2001; Juvonen et al., 2003).

School Accountability

Government policies before 2002 focused solely on providing access to education with no accountability measures to ensure learning was occurring for all students. For example, Lyndon B. Johnson signed the Elementary and Secondary Education Act (ESEA) on April 11, 1956, which provided federal funds to primary and secondary schools with emphasis on equal access and the intention to decrease the gap between the wealthy and impoverished. It was perceived that if children in poverty can become literate, it would ignite the economy. This vision had to be implemented at every local school level across the country. With ethical laws

based on gender and ethnicity taking precedence, more attention was focused on access with little oversight for achievement.

In 2002, George W. Bush reauthorized the Elementary and Secondary Education Act by adding provisions requiring states to develop assessments within specific grade levels to receive federal funding. This reauthorization was named the No Child Left Behind Act (No Child Left Behind (NCLB), 2002)**.** The provisions included accountability measures for states and additional funds to schools where at least 35% of the children in their attendance area come from low-income homes. During this time, the achievement of schools started to be shared publicly with performance data disaggregated by filters such as gender, grade, ethnicity, special education programming, and economically impacted.

As accountability measures progressed, school data were being accessed through internet sites by state departments of education, local politicians, and parents. Responses to underachievement were reform, restructuring, accountability meetings, and personnel changes. Various grade levels and student groups started to become part of research as educational leaders attempted to provide strategies to increase the learning of underperforming groups.

Political Mandates

In December 2015, Congress reauthorized the Elementary and Secondary Education Act law. This bill retained the assessment requirements of NCLB but shifted governance accountability to state-level control. Under new guidelines, states submitted their goals and standards for federal approval (NCLB, 2002)**.** Within the last decade, politicians have begun to look at education accountability systems and pass bills concerning the learning of each student. As a result of there not being enough research on effective educational environments to support the learning of all students, counterproductive approaches have been documented which resulted

in more time spent discussing the bias educators bring into schools, which has been defined as racism.

Based on this trend, educational institutions have instituted recruitment practices to diversify staff, created human resource policies, and used professional development for educators on culturally responsive teaching. Even with addressing the adult thinking on diversity, many educators still have problems educating students from families who are poor. Most educators come to urban or low economic settings believing poor students need to be saved which could equate to the perception that something is wrong with the students (Elie, 2016).

The vision of Lyndon's B Johnson's "Great Society" was to end poverty, abolish inequities, and improve the environment. A research argument concerning inequities turned into the development of the Early Childhood Longitudinal Study (Lee et al., 2014). This study analyzed the math achievement and literacy skills of over 25,000 students between the years 1998 and 2007. The final analysis found the gap in literacy grew 1.25 years each year until Grade 8.

The present study brings attention to literacy achievement in the middle school environment and specifically focuses on students in poverty. It examined quantitative data on Maryland middle schools to identify those that have overcome the pattern of underachievement for economically impacted students. The study was also designed to shed light on the practices and common beliefs of these schools. Describing a school with traditional measures such as academic achievement, graduation rate, and attendance is important, but these alone cannot capture the quality and character of school life. That is why the Maryland accountability system was developed to include a school survey of students and educators to capture perceptual data.

The Maryland School Survey is intended to provide information to support a positive learning and working environment that promotes success for all students.

Literacy Achievement

The ability to read and write is a foundational academic skill that allows students and adults access to all educational content. Students who find challenges with literacy skills often present difficulty in meeting instructional benchmarks in early grades as well as through secondary education. In 2019, 14% of the United States was recorded as being illiterate which could be correlated to the country's high school graduation rate of 87.7% (U.S. Census Bureau, n.d.). How close are we to closing an academic gap in literacy within our country? The National Assessment of Educational Progress (NAEP) reported that the average reading scores in Grade 8 have not significantly changed in a decade (NAEP, 2019).

Although literacy assessments imply more than just reading, it is reading that gets the focus of attention (Alverman et al., 2005). When analyzing the National Assessment of Educational Progress (NAEP) assessment scores from 31 states, Grade 8 scores were lower in 2019 than in 2017. Students in Maryland, the state of study, experienced a declining trend in reading performance. The purpose of the present study was to identify school environments in which economically disadvantages students were performing at the proficient or above level. This led to examining the literacy achievement of middle school students in the state of Maryland as measured by the Maryland Comprehensive Assessment Program (MCAP).

This study was based on the assumption that literacy is the key content area that unlocks success in all school subjects. If the most impacted group is successful in literacy, it can mitigate challenges in other comprehension-based curricula (Alverman, 2005). The psychologically safe school environment is at risk when students have fallen behind their peers in literacy

development. Efforts within schools to intervene often included isolation, additional classes, after-school classes, or computer intervention in the back of the classroom (Fisher & Frey, 2007). Although students may feel isolated from other peer classes, these individualized intensive reading groups of 50 minutes have demonstrated significantly higher scores for students. Palumbo and Sanacore (2009) listed two main reasons why middle school is critical in the literacy achievement of highly impacted students: (a) cognitive ability of students increases from late childhood to early adolescents, and (b) curriculum shifts in focusing on the process of reading to reading within content areas.

In a study of 365 students, Fisher and Frey (2014) reported students in the reading intervention significantly outperformed 290 of the students in a control group. Their analysis of over 7,000 students reveals that technology applications had a small impact on reading achievement of struggling readers with an effect size of .14. When examining reading achievement, a psychologically safe school environment alone does not provide the necessary support. Even with a supportive school structure, the low-income, male, and English language learners participating in the study averaged only 5 or 6 months of progress annually across their years of schooling (Fisher & Frey, 2007). Middle school students who had academic challenges or even life challenges, benefitted from having a caring and supportive environment. This is even more significant when the student has yet to experience success in school (Palumbo & Sanacore, 2009).

Student Perception

In a survey on student perception of safety provided by the U.S. Department of Education (n.d.), 95% of students agreed that they felt safe at schools (Diliberti et al., 2019). Among students in this survey who felt unsafe in schools, there was a significant amount of crime in

their home neighborhoods. Children have a need to feel safe and thrive within predictable environments where emotional fear is proactively protected (Smith et al., 2020). Perceptions of psychological safety include a belief that converges in school environments where students are subject to the same set of structural influences that are determined by salient shared experiences (Edmondson & Moingeon, 1999).

Schools develop safety plans that include training and are designed to mitigate crisis. Graham et al. (2006) conducted a study of 2,148 school districts. It revealed that, of the 2,137 usable responses regarding safety plans for school, 42.8% of the schools reported having no prevention plan for mass-casualty incidents at schools.

Using results of a national preparedness survey, Bucher and Manning (2003) suggested schools' attention in providing safety should be on elements like overcrowding, supervision, and safety plans. They also suggested evaluating community dynamics and negative schoolwide messages. Incidents regarded as violence within schools included mass shootings, sexual harassment, bullying, gang violence, extortion, and other forms of intimidations (Bucher & Manning, 2003). In order to mitigate unsafe incidents, schools create safety action plans, conduct drills, and report serious incidents to their local school districts. In 1997, there were 202,000 serious violent crimes (rape, sexual assault, robbery, and aggravated assault) against students ages 12-18 years in school and 2.7 million total school crimes (Kaufman & Mann 1999).

Santagata, Google's Head of Industry, was quoted by the Harvard Business Review (Delizonna, 2017) regarding the research conducted on high-performing teams within his company. Google had previously conducted a 2-year study on work performance that revealed the highest performing teams had one thing in common: psychological safety. The industry leader defined this as the belief that you will not be punished when you make a mistake (Delizonna, 2017).

After conducting a study consisting of 74 teachers, Kulikova and Maliy (2017) considered psychological safety as one of the most important factors to developing and impacting the well-being of students. Their research reported indicators of psychological safety as students' lack of fear of the teacher, ability to elicit questions to the teacher, independence from the opinions of others, successful establishment of relationships with peers, satisfaction of school conditions, ability to address stress, and positive feeling of content within the school process (Kulikova & Maliy, 2017).

Another way to address psychological safety is to provide an integrated approach of character building, academic interventions, and consistent safety briefings (Kulikova & Maliy, 2017). Fundamentally, the world has changed; a new industrial revolution asks students to work closer together and produce more ideas as a team. These new career skills are incorporated into the learning environment and schools need to address students' psychological safety as well as their physical safety when working with their peers. Edmondson and Lei (2014) proposed that the recent trend in research on psychological safety is due to the enhanced importance of learning and innovation.

As many businesses begin to operationalize their work into teams, decisions need to be made as a group. When making decisions on the direction or next steps teams should take, Johnson and Johnson (1987) found that members who were shy or not quick to communicate were dominated by other members of the group. Hoffman & Maier (1967) commented on working in groups and suggested that people conformed to the norm of the group and that groups tended to lead toward unanimity instead of promoting different ways of thinking.

Psychologically Safe School Environments (PSSE)

For this study, a psychologically safe environment is defined as one that supports students to overcome defensiveness, or learning anxiety, that can occur when they are presented

with content or verbal statements that disconfirm their expectations or hopes (Schein, 1985). Edmondson (1999) provided the term, *team psychological safety,* as the group's ability to display interpersonal risk within the team. This research looks to add school psychological safety to the area of psychology. Psychological safety presents the ability for students to demonstrate oneself without fear of discipline or negative peer comments (Kahn, 1990). Morris et al. (2007) described student perception or student voice as the emotional feelings about any aspect of their school. This feeling of safety was also defined based on the individual's perception of risks in their specific work environment (Kramer, 1999). The concept has recently entered into discussions within schools as more attention is focused on how students perceive their learning environment.

Researchers argued that psychological safety exists when individuals within an organization, team, or group behave in such a way that they feel free to take risks which can also be related to freedom (Dollard & Karasek, 2010). These psychological risks can be described as structures designed for completing tasks in an environment that does not present the potential for causing psychological harm (Cox & Cheyne, 2000). It is important to delineate the difference between psychosocial safety used in this research and psychological safety. Psychosocial is the research of the policy, procedures, and practices that can influence the psychological health of individuals within the environment (Dollard & Karasek, 2010). Psychosocial constructs can cause psychological harm and this study focuses on the student's perception and feeling of those constructs.

The word *safety* is often associated with physical health and safety (i.e., safety climate such as the perceived risk of industrial accidents and injury to physical health). However, this work is focused on psychological health (Dollard & Karasek, 2010). Kramer (1999) described

psychological safety as an individual's perceptions about the consequences of interpersonal risks in the environment.

Edmonson (1999) noted the difference between psychological safety and group cohesiveness in that cohesion reduces an individual's willingness to disagree or challenge each other. Psychologically safe environments are those in which individuals do not take for granted beliefs about how others will respond when one puts oneself on the line, such as when asking a question, seeking feedback, reporting a mistake, or proposing a new idea. The connection this study made to achievement is that students need to feel support and caring from their learning environment. Cohen (2006) suggested that unsupportive environments adversely affect academic achievement, mental health, and physical health.

As stated earlier, psychological safety provides the ability to demonstrate oneself without fear of discipline or negative peer comments to self-image (Kahn, 1990). Within an organizational workforce, research on taking risk when working with teams in order to increase productivity exists within a multimethod field study. Edmonson (1999) presented the argument that psychological safety is a shared belief held by members of a team that it is safe for interpersonal risk taking. The author went on to explain ideas about the team or organization benefiting from the effects of the psychological safety of teams and the impact on learning and performance. The most important priority in the key dynamics revealed in the study of effective teams conducted in the Google organization was psychological safety. Edmondson (1999) found the Google teams with higher psychological safety were less likely to leave the organization, heard diverse ideas from team members, brought in more revenue, and had higher evaluation ratings by superiors.

In 2017, the Maryland legislature created a law requiring the state's federal Every Student Succeeds Act plan include a survey-based measure of school climate (Kautz et.al., 2020). To meet this requirement, the MSDE developed the Maryland School Survey (MSS), a school climate survey for school staff and students (MSDE, 2019). The score for the construct of psychologically safe school environments used in this study is based on this MSDE survey of perceptions administered to all students attending middle schools. Literature discussing the methodology from the research department of MSDE and their collaboration partners at the Mid-Atlantic Regional Educational Laboratory will be reviewed and discussed in Chapter 3.

Fedotenko and Maliy (2013) described negative behaviors that impact psychological safety as school harassment, psychological pressure, bullying, and serious violent crimes. Research has shown that identifying the presence or absence of PSSE in schools can be inferred by analyzing the perceptions of students regarding learning in the environment (Kramer, 1999). The PSSE score incorporates student-reported perception on the negative behaviors and therefore provides one score representing the various challenges perceived by middle school students. For the purpose of this study, the research adds the term psychologically safe school environments to link schools to the organizational thinking presented in the Google research. Now there are schools with high psychological safety that decrease students' fear of asking for feedback, asking questions with elicitation, brainstorming openly in groups, and being comfortable making academic mistakes.

Economic Impact

Poverty has been attributed to having a major impact on student achievement even though some studies such as the one conducted by Orfield and Lee (2005) on public schools in Boston. It found that underachievement of students was due to segregation and inequalities in

facilities. A closer look at their study revealed the urban school district in the sample comprised of 97% of schools with concentrated rates of extreme poverty (Orfield & Lee, 2005). In 2019, 14% of the United States was recorded as being illiterate which could be correlated to the 87.7% high school graduation rate within the United States (U.S. Census Bureau, n.d.). In 2004, Canada provided statistics that indicated literacy levels that increased by just 1% raised the labor productivity by 2.5% which, in turn, increased the annual gross domestic product (GDP) by $32 billion dollars (Project Literacy, n.d.).

Rothstein (2013) maintained for decades that research focused on the percentage of ethnicities in schools, available economic resources in communities, disproportionality in educational services attributed to race, and the impact of the civil rights era. Based on the 2016 census information, the number of students under the age of 18 living in poverty was 31% for Black students, 26% for Hispanic students, and 10% for White and Asian students (National Center of Education Statistics, 2017). Many argued that with certain pedagogical professional development, all educators can learn the necessary skills to support the education of all children. This argument is somewhat validated by achievement data; however, it does not consider that these practices move the performance average for all students. Therefore, within areas with a mix of students performing disproportionality, school-wide professional development not directly focused on impacted student moves the bell curve for achievement for all students.

The perception of poverty is subjective, and the interpretation of how one views or interacts with those in poverty has potential for future research. Obidah and Teel (2001) conducted a study examining racial and cultural differences in schools. This research found that, when students of color were asked if they preferred a White teacher, the majority (70%) of the students of students of color said no. In interviews, a student stated, “No, it doesn’t matter what

color the teacher is, they all teach the same" (Obidah & Teel, 2001, p. 59). The study also noted that 73% of students of color stated they would not prefer a teacher from their own race, 88% were comfortable with a White teacher, and 90% stated they felt their White teacher did not treat them differently than teachers of another race (Obidah & Teel, 2001).

Dr. Christoper Emdin conveyed that educators, especially those teaching in poverty areas, are not in the classroom to save students; they should focus instead on integrating cultures and views of the students into the learning experience (Downs, 2016). Counterproductive approaches have been documented which indicated that educators come into classrooms believing that poor students need to be saved. Could this equate to the perception that something is wrong with the students? If students are seen as victims, then what is the role of educators (Elie, 2016)? Alverman (2005) called the lowering of expectations of students out of good will and reasonable effort "domesticating" education. Students of poverty can come with a false sense of control in their lives. Acting out or withdrawal may be a sign of loss of control and an attempt to regain control. A caring teacher and school environment can provide opportunities for a student to return to their control by offering choices on assignments and demonstrating knowledge using high-interest material (Usher, 2019). When economically impacted students are presented with content or verbal statements that disconfirm their expectations or hopes they often fail to meet educational expectations (Schein, 1985). The current study argues that individuals who are classified as living in poverty need a psychologically safe environment more than any other group of people and, if provided, their achievement may be positively influenced.

In identifying students who are considered within the economically impacted subgroup, each state has their own formula for determining thresholds and application processes for applying for the Free and Reduced Meals (FARMS) program. In the state of Maryland, the

economically impacted subgroup of a school is determined using the number of students who qualify for free meals. In Maryland, students within this subgroup are identified by their local school districts as eligible to receive free or reduced-price meals through direct application. A student's household income must not exceed 185% of the federally designated poverty threshold for a comparable size family living in a similar geographic area (U.S. Department of Agriculture, 2015). Maryland also has other conditions to qualify students for FARMS; all children in households receiving benefits from the Food Supplement Program or Temporary Cash Assistance are eligible to receive free meals at school regardless of parent income.

This study agrees that there are many factors that can mitigate student success, but the important educational tool is to create a psychologically safe school environment. Even though, of all the states, Maryland had the third lowest percentage of poverty during 2018, there remains a concern that poverty has been overlooked as a significant moderator of underachievement. Deluca and Rosenblatt (2010) suggested that most students in poverty attended their zoned neighborhood school which tended to be underperforming. This research on school choice indicated that a way to improve school opportunities is to provide more opportunities to economically disadvantaged neighborhoods (Deluca & Rosenblatt, 2010).

Johnson (2013) maintained that educational research has started to associate underachievement with school quality. Most of the research, however, comes back to documenting concerns about school climate because of the geographic location of schools in urban areas with high rates of poverty. Realistically, educators should be able to embrace the concept that the same outcomes for wealthy students can be applied to students in poverty (Johnson, 2013).

An increase in teacher and student relationships may increase student motivation to actively participate when traditionally a student may have had little interest in a particular content (Fredriksen & Rhodes, 2004). Fredriksen and Rhodes (2004) noted the result of effective staff for student relationships. They found that supportive relationships with teachers may augment students' motivation to learn and secure attachment with a teacher partially compensated for insecure child-mother attachment relationships. Students in middle schools that intentionally sought to enhanced teacher-student relationships tended to have fewer adjustment difficulties during the transition (Fredriksen & Rhodes, 2004). They also maintained that resources should be deployed that enhance student-teacher fit such that the student feels supported, and the teacher feels effective (Fredriksen & Rhodes, 2004).

Teachers can influence the dynamics of their classrooms and build strong teacher-student relationships that support student learning. Fredriksen and Rhodes (2004) suggested that students with adequate socialization concepts can interact with teachers and peers in a positive way. Their position supported the present study's argument by stating students' negative perceptions of overall school environment resulted in students being reluctant to use teachers for support without the school's investment in staff-to-student relationships.

Conclusion

The study attempted to engage further discussion on the overarching placebo effect that psychologically safe school environments can have on the school's most impacted subgroup, economically impacted students. Table 5 includes an annotated list of the foundational works that support the present study. Comments and recommendations have been presented that school leadership also plays a role in shaping an important climate for underperforming schools (MacNeil et al., 2009). The bottom-line is that the impact of poverty on students can be

detrimental to their education. Educators must be able to understand that students in poverty, on average, come with higher probability of exposure to violence, adolescent childhood trauma, and lack of resources compared to their peers (Haberman, 1995, 2005). These characteristics can be exacerbated when there is a high concentration of low-income families in a school's attendance area (Simons et al., 2004; Wilson, 1997). This study considers that, while the basic physiological needs are met, the next level of need is the safety of humans. Children have a need for safe and predictable environments and can react with emotional fear when this need is not met (Smith et al, 2020).

Table 5

Foundational Work that Influenced the Study

Author	Date	Association with Research	Research Contribution
Maslow	1943	Theory of human motivation	All behaviors are driven by needs and those needs are pursued in a hierarchical fashion. The pursuit suggests that higher level needs are contingent upon the lower-level needs being met.
Deluca & Rosenblatt	2010	Neighborhood Quality	Research which suggested that affluent communities have higher-performing schools, because of educationally engaged peers and parent access to networks about school quality.
Delizonna	2017	Risk taking	The industry leader defined this as the belief that you won't be punished when you make a mistake
Kramer	1999	Psychological safety	Described psychological safety as an individuals' perceptions about consequences of interpersonal risks in their environment.
(Orfield & Lee	2005	Impact of poverty on education	The majority of the schools identified with low (PSSE) were located in urban areas with concentrated rates of extreme poverty
Haberman	1995, 2005	Impact of poverty on education	The bottom-line is that the impact of poverty on students can be detrimental to their education. Educators need to understand that students in poverty on average come with higher probability of exposure to violence, adolescent childhood trauma, and lack of resources compared to their peers
Rothstein	2013	Impact of poverty on education	Believes research for decades has focused on the ethnicity percentages of schools, economic resources available in communities, disproportionality in educational services attributed to race, and the impact of the civil rights era.
Johnson	2013	School climate	Believes educational research has started to associate underachievement to school quality; however, most of the research comes back to documenting concerns with climate as a result of the geographic location of schools in urban areas with high poverty rates.

Author	Date	Association with Research	Research Contribution
Fredriksen & Rhodes	2004	Adolescent perception on school environment	Students with adequate socialization concepts are able to interact with teachers in a positive way and with peers.
Griffith	1999	Adolescent perception on school environment	Much of the literature on school leadership has focused on expectations of academic standards, evaluating teachers, and navigating outside interferences.
Kautz, Tilley, Ross, & Larkin,	2020	Student survey measures	Results from the student survey can elevate school improvement if data is disaggregated by perception topic, it provides accessible comparison tables using similar demographics, and highlights school stories to assist educators in diagnosing problems and designing solutions to address factors that can be difficult to measure.
Kautz, Tilley, Ross, & Larkin,	2020	Student survey measures	The Maryland State Department of Education (MSDE) partnered with the Mid-Atlantic Regional Educational Laboratory to co-develop, validate, and benchmark a school climate index based on the Maryland School Survey
Palumbo & Sanacore	2009	School environment	Authors list two main reasons why middle school is critical in the literacy achievement of highly impacted students: (1) cognitive ability of students increases from late childhood to early adolescents (2) curriculum shifts in focusing on the process of reading to reading within content areas.
U.S. Census Bureau	n.d.	School environment	In 2019, 14% of the United States was recorded as being illiterate which could be correlated to the 87.7% high school graduation rate within the United States.
Edmondson	1999	Psychological safety	This concept supports the research within business organizations that the environment if free to take more risks when all members take responsibility for doing good work without focusing on blame.
Kahn	1990	Psychological safety	Psychological safety provides the ability to demonstrate one's self without fear of discipline or peer comments negative to self-image
Dollard & Karasek,	2010	Psychological safety	The definition of psychological safety is when individuals within the organization, team, or group behave in such a way that they feel free to take risk which can also be related to freedom.
Kahn	1990	Psychological safety	The ability for each student to demonstrate one's self without fear of discipline or negative peer comments to self-image, peer status, or teacher reprimand.
Schein,	1985	Psychological safety	Defined a psychological safe environment as one that supports students to overcome defensiveness, or "learning anxiety," that can occur when they are presented with content or verbal statements that disconfirm their expectations or hopes
Smith et al.	2020	Psychological safety	Children have a need to feel safe and thrive within predictable environments where emotional fear is proactively protected
Reynolds et. al.	1996	Psychological safety	In researching psychological safe school environments, other factors may also influence student achievement such as: economics, high expectations for student achievement, frequent evaluation of student progress, a safe and orderly school climate, and educational leadership.

CHAPTER 3 METHODOLOGY

This chapter includes a description of the study methodology. Research questions, study variables and the study population are also included. Data collection instruments and procedures are followed by a description of reliability and validity. The chapter ends with a discussion of study limitations and conclusions.

This study fell under the umbrella of an analytical quantitative design, specifically a correlation study to determine if there is an association between variables. Statistical tests were used to explore the association between psychologically safe school environment (PSSE) and overall literacy achievement (OLA), economically impacted literacy achievement (EILA), and economically non-impacted (NILA). The independent, dependent, and moderator variables are shown in Figure 2, the concept map included in Chapter 1.

Research Questions and Hypotheses

Secondary data from the MSDE, which included a school survey and the Maryland Comprehensive Assessment Program (MCAP), were analyzed to answer the following research questions:

- Research Question 1 (RQ1): What relationship exists between psychologically safe school environments (PSSE) and literacy achievement? Does the strength of the relationship differ for economically impacted students compared to their non-impacted peers?
- Research Question 2 (RQ2): How does the effect of psychologically safe school environments on literacy achievement vary based on a school's economic stratum?

Given the purpose of the study and the research questions, the following hypotheses were examined:

- Hypotheses to address RQ1:
    - H1A: There is a correlation between psychologically safe school environments (PSSE) scores and literacy achievement scores of all students.
    - H1B: There will be a correlation between PSSE scores and literacy achievement scores of economically impacted students.
    - H1C: There will be a correlation between PSSE scores and literacy achievement scores of non-economically impacted students.
- Hypotheses to address RQ2:
    - H2A: Economic stratum will moderate the relationship between psychological safe school environments (PSSE) scores and literacy achievement scores of all students.
    - H2B: Economic stratum will moderate the relationship between PSSE scores on the literacy achievement scores of economically impacted students.
    - H2C: Economic stratum will moderate the relationship between PSSE scores on the literacy achievement scores of economically non-impacted students.

The Statistical Program for Social Sciences (SPSS) was used to conduct preliminary analysis, descriptive statistics, assumptions, and three moderated analyses. Preliminary analyses ensured no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Descriptive statistics were completed for each variable within the study and examined to determine variance, if any. Three moderated multiple regression models were used to explore the hypotheses set for each research question. SPSS was used to create visualization tools to accentuate the various economic stratum by Maryland school district, display levels of PSSE associated with literacy achievement, and provide visual representations.

Variables

I retrieved archival data on student perceptions of school safety from the Maryland Department of Education website dated spring 2019. This archival data was used to create the psychologically safe school environment score (PSSE). The study defined this independent variable, PSSE, as the environment that supports students to overcome defensiveness, also referred to as learning anxiety, that can occur when they are presented with content or verbal statements that disconfirm their expectations or hopes (Schein, 1985). The quantitative measure, the PSSE score, was based on the Maryland Student Survey developed by the MSDE in collaboration with experts at the Mid-Atlantic Regional Educational Laboratory. The Maryland Student Survey was created to assist Maryland educators in identifying qualities and characteristics of a positive learning and working environment. The survey is administered to all Maryland students in grades 5 to 11 in the spring each school year. The survey for students contains four domains: safety, community, environment, and relationships. The survey included respondents' level of agreement with statements about their school or classroom, their own behaviors and attitudes, and perceptions toward peers and teachers (Kautz et al., 2020). All responses on the survey used the same scale of *strongly agree, agree, disagree*, and *strongly disagree*. Each student must answer 50% or more of the items in a topic with each topic of the survey given a score between 1 and 10. The topic scores of the student survey, each between 1 and 10, are averaged together to become the student topic score (Maryland School Survey Manual, 2020). This score for each middle school was retrieved from the Maryland Report Card website for the school year 2018-2019 and labeled the psychologically safe student environment (PSSE) score for this study.

The dependent variables in this study were overall literacy achievement (OLA), economically impacted literacy achievement (EILA), and non-economically impacted literacy achievement (NILA). The literacy achievement data reported spring 2019 was retrieved from the MSDE website which provided the percent proficiency in literacy for schools using the MCAP. Literacy achievement was measured by the percentage of students scoring proficient or higher on the English language arts portion of the MCAP. The percentage represents students scoring proficient or higher on the MCAP literacy test (MSDE, 2021).

The quantitative measure for each of the dependent variables was reported as a percentage on the Maryland report card. Student groups include the following disaggregated groups: American Indian/Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, Black/African American, Hispanic/Latino of any Race, White, Two or More Races, Economically Disadvantaged, Students with Disabilities, or English Learners. Only student groups with 10 or more students were reported by MSDE.

In this study we introduce a moderator variable, Economic Attendance Area (ECOZ). In a causal relationship, if x is the predictor variable and y is an outcome variable, then z is the moderator variable that affects the casual relationship of x and y. Most of the moderator variables in causal relationship are measured using regression coefficient. A moderator variable, commonly denoted as just M, is a third variable that affects the strength of the relationship between a dependent and independent variable. The moderator variable, if found to be significant, can cause an amplifying or weakening effect between x and y. The quantitative measure for ECOZ was derived using the median income of the school's attendance serving area. Zip code median income was determined using the U.S. Census Bureau's archival data from the

economic year 2019, which is the same reported year as the achievement data used in this study (U.S. Census Bureau (2019).

Participants/Sample Population

The population sample for this study was Maryland middle schools using statistics on the entire population with a number of exclusions. The sample limited the population to all public middle schools with the exclusion of application charter, magnet select, and other specialty program schools. For consistency, the study excluded various private and special schools, academies, technical schools, homogenous special needs' schools, and schools with unreported data. Schools served as the unit of analysis while independent factors were analyzed to determine their influence on overall literacy achievement of economically disadvantage subgroups. The study included data retrieved from the MSDE website on all included middle schools. The school districts equated to 23 counties in the state of Maryland plus Baltimore City.

Data Analysis

Before data collection began, I requested and received the Hood College Institutional Review Board's (IRB) approval. The approval was received on October 26, 2020. Appendix C includes a copy of the IRB decision letter.

I analyzed the PSSE scores for Maryland middle schools along with the dependent variables of overall literacy achievement (OLA) scores, economically impacted literacy achievement (EILA) scores, and non-economically impacted literacy achievement (NILA) scores. Three moderated multiple regression (MMR) models were used to explore the influence psychological safety had on the three dependent variables. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, or homoscedasticity.

I used the Statistical Program for Social Sciences (SPSS) to perform MMR models that were analyzed at the .05 significance level. After completing the regression model, I examined the R squared to determine any change in variance. The beta value and statistical significance are reported together. The research design included a moderator, the median income of a participating school's attendance area (ECOZ) and will be the product of PSSE and (ECOZ).

I divided schools into a stratum of lower economic area (LE), middle economic area (ME), upper middle economic area (UME), and upper economic area (UE). The median income was used because some low economic areas had gentrified which skewed the average income as an appropriate unit of measure for a serving area. The terms low economic area, average economic area, and high economic area were based on taking the median incomes of all Maryland attendance school serving areas and creating a quartile range.

Microsoft® Excel was used to calculate quartile ranges for the median statistics by a school's attending zip code. The Excel function provided the option of calculating using Quartile Inclusive (Inc.) or Quartile Exclusive (Exc.). Quartile Inc. was selected for this calculation based on calculating and using a percentile range of 0 to 1 that has a greater-than or equal-to behavior when processing. Quartile Exc. function bases its calculation on a percentile range of 0 to 1 exclusively and processes with the greater-than behavior. Table 6 displays the median quartiles for median income for the study schools using both the quartile Inc. and quartile Exc.

Table 6

Median Income for School Sample Serving Area

Five Number Summary	Median quartile (Inc.)	Median quartile (Exc.)
Smallest Value (min)	$34,197.00	$34,197.00
Q1	$71,907.00	$71,907.00
Q2	$91,607.00	$91,607.00
Q3	$121,772.75	$122,466.50
Largest Value (max)	$950,052.00	$950,052.00

In analyzing the data shown in Table 6, it can be observed that, in the exclusionary calculation (Exc.), quartile 3 increases by $693.75; therefore, the quartile Exc. increases the range between Q2 and Q3. Thus, the quartile Inc. formula was used for calculating economic classifications for the study. SPSS software was used to identify outliers or leverage values that changed the economic stratum to exclude values that skewed the data.

Maryland provided three survey instruments on school quality for the following populations: elementary and middle school students, high school students, and instructional staff. Student survey forms were administered to elementary, middle, and high school students with the differentiation being that the high school survey had one additional question item in the bullying topic (Kautz et al., 2020).

Scores were benchmarked and can be compared to one another. Table 7 lists a sample of data on student perceptions provided by the MSDE through their public website. As an example of the data provided, Aberdeen Middle School's topic score for overall school quality, labeled PSSE for this study, is 2.6 compared to Mario Loiederman Middle School's higher score of 4.1 for overall school quality. This means that the latter school's average overall perception of school quality is more favorable than the average perception of Aberdeen Middle School. School leaders can use the comparability of topic scores to prioritize support in one area over another.

Table 7

Example of Data for Student Perception of Middle Schools in Maryland

School ID	School Name	PSSE	Zip code	Physical Environment	Staff-Student Relationships	Bullying	Emotional Safety	Physical Safety
787	A. Mario Loiederman Middle	4.1	20906	1	5.90540925	3.20093107	4.57373386	1.74470017
265	Aberdeen Middle	2.6	21001	1	4.20793335	1	2.23817966	1
509	Accokeek Academy	4.9	20607	3.38560828	6.05488995	3.59812573	5.07867824	2.73791398
337	Afya Public Charter School	5.3	21213	2.16666707	7.41383218	3.23122222	6.11121582	3.12988163
645	Andrew Jackson Academy	2	20747	1	2.99195516	1.49192081	1.63142566	1
4033	Annapolis Middle	3.1	21403	1	5.04861961	1.89619785	3.65588445	1
1356	Arbutus Middle	3.1	21227	1	5.22860271	1.85787549	3.14554255	1

The achievement data were pulled from the MSDE website and provided the percent proficiency in literacy for economically disadvantage subgroups. The data used in this study included overall school achievement for literacy Grades 6–8, overall achievement of White, Black, and Hispanic students, and overall achievement of economically impacted students. An example of these data is listed in Table 8.

Table 8

Example of Data for Literacy Achievement of Middle Schools in Maryland

School ID	School Name	ELA Overall	Two or more	Asian	White	Black	Hispanic	Economic Impacted
787	A. Mario Loiederman Middle	38.2	67.9	57.4	70.5	43.1	26.9	21.5
265	Aberdeen Middle	29.2	28.8	50	33.6	24.6	25.5	14.5
509	Accokeek Academy	60.4	76.9	87.1	77.4	59.1	51.1	48.4
337	Afya Public Charter School	22				22.4	7.7	20.8
645	Andrew Jackson Academy	8.7				9.5	0	7.5
4033	Annapolis Middle	27.5	43.5	83.3	69.9	11.5	11.5	5.5
1356	Arbutus Middle	37.4	27.3	55.6	40.1	23.3	34.1	24.8

Reliability and Validity

The MSDE partnered with the Regional Educational Laboratory (REL) Mid-Atlantic to co-develop, validate, and benchmark a school climate index based on the Maryland School Survey (Kautz et al., 2020). The climate index served as a measure of school quality and student success in Maryland's school accountability framework. The MSDE and their REL Mid-Atlantic partner developed the Maryland School Survey by drawing on items from several existing, validated surveys: the Delaware School Climate Survey, the ED School Climate Surveys [EDSCLS], the Illinois 5 Essentials Survey, and a survey from a federally funded principal professional development program evaluation. The Maryland School Survey met standard criteria for reliability and validity using data from a fall 2018 field test and the 2019 spring administration. MSDE and its partner followed a process of psychometric analysis and benchmarking based on the U methodology. Comparability of topic scores was accomplished using a Rasch partial credit model (MSDE, 2020).

The MSDE psychometric benchmarking methodology addressed school climate items by using a 4-point Likert response option scale. Instead of using the average value of the responses within a school climate topic as the topic's score, Rasch-based 5 methodologies statistically adjusted and converted original responses onto a common scale that accounted for differences in item difficulty. In a Rasch model, the item difficulty and the measure of a person's ability (or a person's other latent traits such as perception of school climate) are placed on a common scale. The item difficulty is then defined as the point at which people with the same level of perception of school climate have a 0.5 probability of selecting a specific response category instead of its lower category (Wang & Degol, 2016).

The MSDE administered the survey statewide for accountability purposes beginning in spring 2019 following a field test in fall 2018 (Kautz et al., 2020). The Rasch partial credit model (PCM) (Masters, 1982) was used instead of the Rasch rating scale model (RSM) (Andrich 1978) for item calibration because PCM did not assume equal category thresholds across items (Wang & Degol, 2016). Items of the student survey were designed to require a reading level commensurate with the population being surveyed. Researchers examined items for high nonresponse rates and low item response variance to validate the use of the survey (Kautz et al., 2020).

All responses on the Maryland School Survey used the same 4-point scale of *strongly agree, agree, disagree*, and *strongly disagree*. Elementary and middle school students in Grades 5–8 took a survey with 54 questions. High school students in Grades 9–11 took a survey with 55 questions. Educators took a survey with 73 questions. The survey was untimed. Most students typically completed the survey within 30 minutes once they have logged into the online system (MSDE, 2020). Each participant (respondent) must have answer at least 50% of the items in a topic or at least three items within a topic in order for a topic score to be calculated and used in determining the school survey index. A participant received a topic score for any topic where they meet the minimum requirements, regardless of their participation in the rest of the survey topics. See Appendix D for the criteria for determining reliability and validity of Maryland student survey.

Limitations

The state of Maryland has been in the top two highest state or territory for median household incomes for the last 5 years (U.S. Census Bureau, 2019). Generalizability to states or territories with vastly different median household incomes may be limited.

The study is also limited to the correctness of the reported data on the Maryland State Report Card. In this data set, the economically impacted subgroup could be overrepresented in some areas where the majority of the population has been identified as eligible for the FARMS program which causes the state to approve the entire school for representation without application. In other areas, the data set could be underrepresented due to some parents deciding not to complete the application process. The survey data used for the psychologically safe school environment construct are limited to 1 year.

For disaggregated Maryland reporting information, any reporting subgroup (n) has number of students less than 5% or greater than 95% of the total, the exact number is suppressed. For example, if a school has 3% of its FARMs students proficient on the ELA8 test, the data will be reported as <5%. (personal communication, executive Director of Research, MSDE, February 5, 2019).

Conclusion

Early research by Maslow shows that there are important levels of support needed for people to feel safe. This study examined the differences in student achievement based on perceived psychological safety in school environments. Data analysis and findings of hypotheses will be shared in Chapter 4.

CHAPTER 4 FINDINGS, RESULTS, AND ANALYSIS

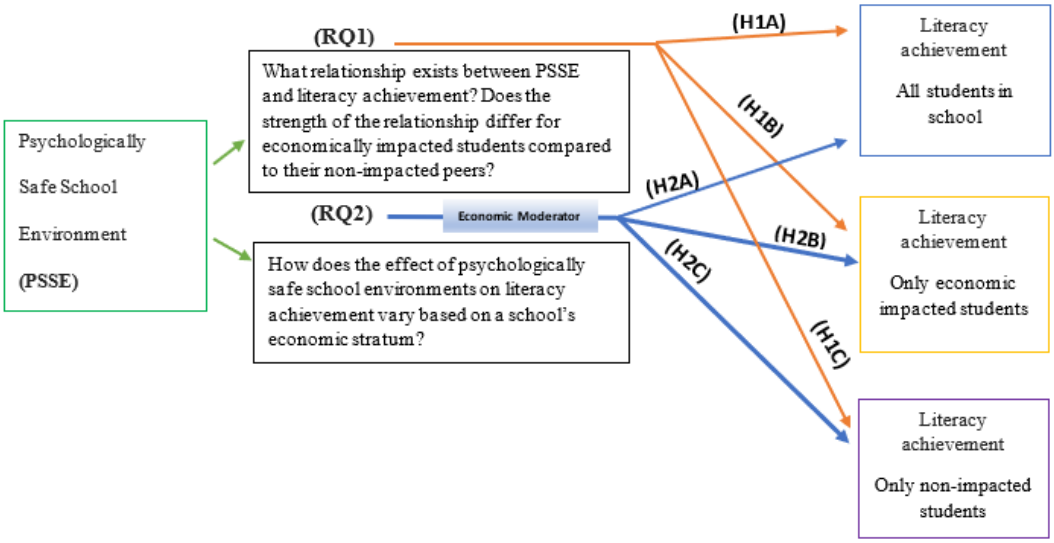
This study examined how school psychological safety can influence the literacy achievement for students. The literature suggests various ways of identifying mitigating factors and the benefits to psychological safety. The Maryland School Survey was administered by the state of Maryland to students in the spring of 2019. The school average score for students was used as the measure for psychologically safe school environments. This chapter presents the analysis and findings of three statistical regressions labeled Moderated Analysis I, II, and III. Each section is preceded by a description of the analysis and a summary of findings.

Summary of Methods

This study fell under the umbrella of an analytical quantitative design and was specifically a correlation study that determines if an association exists between variables. Statistical tests were used to explore the association between a psychologically safe school environment (PSSE) and overall literacy achievement (OLA), economically impacted literacy achievement (EILA), and economically non-impacted literacy achievement (NILA). The independent, dependent, and moderator variables are shown in Figure 2. The Statistical Package for the Social Sciences (SPSS) was used to conduct preliminary analysis, descriptive statistics, assumptions, and three moderated analyses.

Figure 2

Conceptual Map



Research Questions and Hypotheses

The following research questions and hypotheses guided the study.

- **Research Question 1 (RQ1):** What relationship exist between schools' psychological safe school environments (as measured by student perception survey) and literacy achievement (as measured by Maryland Comprehensive Assessment Program)? Does the strength of the relationship differ for economically impacted students compared to their non-impacted peers?

- **Research Question 2 (RQ2):** How does the effect of psychologically safe school environments (as measured by a student perception survey) on literacy achievement vary based on a school's economic stratum?

The research questions with associated hypotheses are displayed in Figure 2.

Given the purpose of the study and the research questions, the following hypotheses were examined:

- Hypotheses to address RQ1:
    - H1A: There is a correlation between overall psychological safe school environment (PSSE) scores and literacy achievement scores of all students.
    - H1B: There will be a correlation between PSSE scores and specifically literacy achievement scores of economically impacted students
    - H1C: There will be a correlation between PSSE scores and specifically literacy achievement scores of non-economically impacted students.
- Hypotheses to address RQ2:
    - H2A: Economic stratum will moderate the relationship between Psychological Safe School Environments on literacy achievement.
    - H2B: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically impacted students.
    - H2C: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically non-impacted students.

Table 9 provided the hypotheses and the study variables associated with each.

Table 9

Hypothesis Associated with RQ1 and RQ2 and the Primary Variables

Hypothesis	Primary Variables
H1A: There is a correlation between overall psychologically safe school environment (PSSE) scores and literacy achievement scores of all students.	PSSE, OLA
H1B: There will be a correlation between PSSE scores and specifically literacy achievement scores of economically impacted students	PSSE, EILA, NILA
H1C: There will be a correlation between PSSE scores and specifically literacy achievement scores of non-economically impacted students.	PSSE, NILA, EILA
H2A: Economic stratum will moderate the relationship between Psychological Safe School Environments on literacy achievement.	PSSE, ECOZ, OLA
H2B: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically impacted students	PSSE, ECOZ, EILA
H2C: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically non-impacted students	PSSE, ECOZ, NILA

Data Collection

The PSSE score and achievement data for schools were retrieved from the MSDE website for all middle schools in the state. Middle schools that are combined with elementary schools were filtered to only provide data representing middle school Grades 6–8. The economic data to form the moderator variable was retrieved from the U.S. Census Bureau for the year 2019, which is aligned with when the students were tested (U.S. Census Bureau, 2019). As stated in the discussion of limitations, the statistical findings were bound to correctness based on the accuracy of the Maryland State Report Card.

Data Preparation

Data from the MSDE survey, the MCAP achievement data, and enrollment were downloaded into a Microsoft® Excel file and then uploaded to SPSS version 26. The census data, which served as the economic moderator variable, were also downloaded to an Excel file with a

measure of variance conducted to provide an economic stratum for school analysis. I performed a visual inspection of the data to identify signs of missing data and reviewed downloaded data against the MSDE website to ensure accuracy. SPSS was used to test for extreme outliers and leverage values outside the acceptable statistical range. Visual inspection was based on looking for patterns of incorrect scores and descriptions of the schools that would qualify for exclusion. Based on the visual inspection and preliminary test, 230 schools entered into the descriptive statistics for each variable and for the moderated analyses (Moderated Analysis I, II, and III).

Characteristics of the Sample

Maryland middle schools served as the population for this study with exclusions occurring for a variety of reasons. The sample was limited to the population of all public middle schools with the exclusion of application charter schools, magnet select schools, or other specialty program schools. For consistency, the study excluded various private and special schools, academies, technical schools, homogenous special needs' schools, and schools with unreported data.

The first level of exclusions of the sample included several charter, magnet, and special program schools. Because the premise of the study centered on the correlation between PSSE and literacy achievement, schools such as charter and magnet programs with selection or application processes may base student enrollment on prior history of advanced academic performance. Charter, magnet, or special program schools were also excluded given the study's use of an economic moderator. It is common for students to come from a variety of adjacent zip codes; however, an assumption of the study is that the economic median income associated with the physical site of a school may influence the relationship between variables. The excluded schools may accept students outside a set attendance area adjacent to the physical site and the

current data set sample would be unable to identify and account for those students living outside the school's adjacent areas. As a result, schools with programs that accepted groups based on exceptional academics, residences in non-adjacent zip codes of a school, or other factors exacerbate data points were excluded.

Additional exclusions were made based on MSDE reporting criteria. Schools with enrollment below the MSDE threshold of reporting for any of the dependent variables were excluded from the sample. According to MSDE, only student groups with 10 or more students are reported. Student groups included: American Indian/Alaskan Native, Asian, Native Hawaiian or other Pacific Islander, Black/African American, Hispanic/Latino of any race, White, two or more races, economically disadvantaged, students with disabilities, or English learners (MSDE).

The following schools were excluded due to the enrollment of their economically disadvantaged group being under 5% or their non-economically disadvantaged group being under 5%. This is followed by the list of schools excluded by district which were identified as charter, magnet, or insufficient public data was available through MSDE. The complete list of the 89 middle schools that were excluded from the study sample can be found in Appendix E.

Schools Excluded Due to Low Enrollment of their Economically or Non-economically Disadvantaged Group

Eight public schools were excluded for enrollment less than 5% of total student enrollment. Four schools were from Howard County, two were from Montgomery County, and two were from Baltimore City.

Schools Excluded for Charter, Magnet, or Insufficient Data

A total of 85 schools were excluded because they were either charter or magnet schools or because of insufficient data. Of the 85 schools, 40 were excluded due to their identification as

magnet schools. The largest number (24) of those schools were from the Baltimore City Public Schools followed by Prince George's Public schools which had 10. A total of 19 schools were excluded based on their identification as magnet schools. These schools came from one city and three counties (Baltimore City Schools, Prince George's Public Schools, Montgomery County Public Schools, and Washington County Public Schools). Finally, 13 schools were excluded based on low enrollment (less than 5% of total enrollment) of either their economic disadvantaged group or their non-economic disadvantaged group. These 13 schools came from Baltimore City Public Schools (5 schools) and six other school districts each of which had 1 or 2 schools excluded. Appendix E includes the list of all schools excluded and the reason for their exclusion.

Included Schools

After the excluded schools were eliminated, the remaining schools totaled 234 middle schools. I downloaded results of the Grades 6–8 spring 2019 administration of the Maryland survey for these 234 schools from the MSDE website. See Appendix F for a complete list of every school included in the study sample.

Unit of Analysis

This study used statistical data from 234 public middle schools in the state of Maryland and analyzed psychologically safe school environment scores and their influence on the achievement of middle school students, specifically economically impacted students. In the analyses, the impact of the economic area was used as a moderator to determine interaction effect. An economic stratum, shown in Table 10, was created based on the U.S. Census Bureau classification for family economics.

Table 10

Economic Classification Stratum

Economic Classification	Abbreviation	Range
Lower Economic Area	LE	≤ $71,907.00
Middle Economic Area	ME	$71,908.00–$91,607.00
Upper Middle Economic Area	UME	$91,608.00–$121,772.75
Upper Economic Area	UE	≥ $121,773.75

Table 11 provides the sample's frequency statistics for each economic classification. As indicated in the table, the study sample included 55 schools (23.5%) with an economic classification of lower economic area (LE), 52 schools (22.2%) with an economic classification of middle economic area (ME), 66 schools (28.2%) with an economic classification of upper middle economic area, and 61 schools (26.1%) with an economic classification of upper economic area.

Table 11

Economic Classification Frequency Table

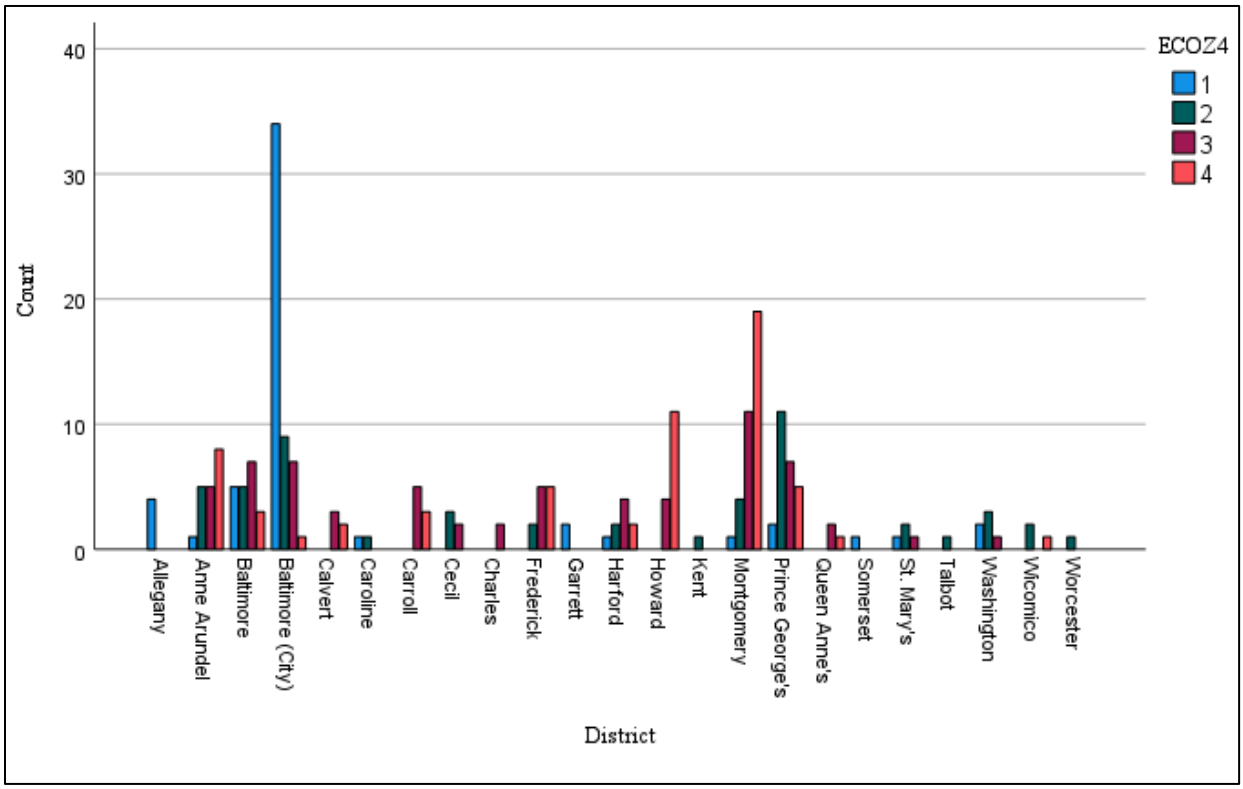
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Lower Economic Area (ECOZ 1)	55	23.5	23.5	23.5
Middle Economic Area (ECOZ 2)	52	22.2	22.2	45.7
Upper Middle Economic Area (ECOZ 3)	66	28.2	28.2	73.9
Upper Economic Area (ECOZ 4)	61	26.1	26.1	100.0
Total	234	100.0	100.0	

The study sample includes 107 Maryland middle schools that were geographically located in an area below the median income of $91,607.00. There were also 127 Maryland middle schools within this study that were geographically located in an area above the median income of $91,608.00. In the year of 2019, the median income for the United States was

$68,703. After sorting the median income for all school within the study, it was discovered that 183 schools in the sample were above the national median income for 2019. Figure 3 displays the economic classification stratum for the study by Maryland school district.

Figure 3

Economic Classification by Maryland School District



Descriptive Statistics and Analysis of Variables

The next section provides statistics on the independent, dependent, and moderator variables. Each section reports context, statistics on the variable, analysis of statistical data, and specific details on the findings. On each variable test for measures of variation, descriptive statistics, histogram, Q-Q plot, and Kolmogorov-Smirnov test are provided. The discussion of the of variables is given in the following order:

- psychologically safe school environment score (PSSE), independent variable
- overall literacy achievement of students (OLA), dependent variable
- economically impacted literacy achievement (EILA), dependent variable
- non-economically impacted literacy achievement (NILA), dependent variable

Table 12

Summary of Variables Used for Study Analysis

Variable Name	Variable Type	Level of Measure	SPSS Description	Data Source
Psychologically Safe School Environment	Independent	Scale	PSSE	MD School Survey
Overall Literacy Achievement	Dependent	Scale	OLA	% Proficient MCAP
Economically Impacted Literacy Achievement	Dependent	Scale	EILA	% Proficient MCAP
Non-Economically Impacted Literacy Achievement	Dependent	Scale	NILA	% Proficient MCAP
Product of Psychologically Safe School Environment and Economic moderator	Independent	Scale	PSSE_X_ECOZ	SPSS

Psychologically Safe School Environment (ESSE)

For the purpose of this research, I retrieved archival data on student perceptions of school and climate safety dated spring 2019 from the MSDE website. This archival data was used to represent the ESSE score. For this study PSSE, the independent variable, was defined as the environment that supports students to overcome defensiveness or learning anxiety that can occur when they are presented with content or verbal statements that disconfirm their expectations or hopes (Schein, 1985).

Reliability and Validity

The Maryland State Department of Education (MSDE) partnered with the REL Mid-Atlantic to co-develop, validate, and benchmark a school climate index based on the Maryland

School Survey (Kautz et al., 2020). The climate index served as a measure of school quality and student success in Maryland's school accountability framework. The Maryland School Survey was developed by drawing on items from several existing, validated surveys: the Delaware School Climate Survey, the ED School Climate Surveys [EDSCLS], the Illinois 5 Essentials Survey, and a survey from a federally funded principal professional development program evaluation.

The survey met standard criteria for reliability and validity using data from a fall 2018 field test and the 2019 spring administration. MSDE and REL Mid-Atlantic followed a process of psychometric analysis and benchmarking based on the U.S. Department of Education's methodology, provided below. Comparability of topic scores was accomplished using a Rasch Partial Credit Model, provided below (MSDE, 2019a).

The psychometric benchmarking methodology addressed school climate items by using a 4-point Likert response option scale. Instead of using the average value of the responses within a school climate topic as the topic's score, Rasch-based 5 methodologies statistically adjust and convert original responses onto a common scale that accounts for differences in item difficulty. In a Rasch model (Andrich, 2016), the item difficulty and the person ability (or a person's other latent traits, such as perception of school climate) are placed on a common scale, and the item difficulty is defined as the point at which people with the same level of perception of school climate have a 0.5 probability of selecting a specific response category instead of its lower category (Wang & Degol, 2016).

MSDE administered the survey statewide for accountability purposes beginning in spring 2019 following a field test in fall 2018 (Kautz et al., 2020). The Rasch partial credit model (PCM) (Masters, 1982) was used instead of the Rasch rating scale model (RSM) (Andrich, 1978)

for item calibration because PCM does not assume equal category thresholds across items (Wang & Degol, 2016). Items of the student survey were designed to require a reading level commensurate with the population being surveyed with identification of items respondents have difficulty understanding. Researchers examined items for high nonresponse rates and low item response variance to validate the use of the survey (Kautz et al., 2020).

The Scale

All responses to items used the same 4-point scale of *strongly agree, agree, disagree*, and *strongly disagree.* The MSDE survey was administered to elementary, middle, and high school students and to educators. Elementary and middle school students in Grades 5–8 took a survey with 54 questions. High school students in Grades 9–11 took a survey with 55 questions. Educators took a survey with 73 questions. The survey was untimed. Most students completed the survey within approximately 30 minutes once they had logged into the system (MSDE, 2020).

Each participant (respondent) was required to answer 50% or more of the items in a topic and at least three items within a topic in order for a topic score to be calculated and used in determining the School Survey Index. A participant received a topic score for any topic for which they met the minimum requirements, regardless of their participation in the rest of the survey topics. To ensure validity, survey participants could not have a score calculated for a topic which might impact the n-size for a school or student group in reporting.

As shown in the output presented in Table 13, the independent variable PSSE for the 234 schools in the sample ranged from 1.9 to 7.2, with a mean of 3.74 and a standard deviation of .9140. The data set in the variable PSSE has a small amount of variation and followed a standard normal distribution. Due to the positive skewness, the value suggested scores clustered

to the left at the low values, therefore, more schools with lower, rather than higher, PSSE scores existed in the sample.

Table 13

Measures of Variation for PSSE

	N	Minimum	Maximum	Mean	Std. Dev.	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PSSE	234	1.9	7.2	3.740	.9140	.541	.159	.233	.317
Valid N (listwise)	234								

Table 14 displays the statistics used to determine the 5% trimmed mean comparison as well as the median for the variation statistics for PSSE. This statistical table was used several times during preliminary analysis by comparing the 5% trimmed mean with the original mean. When items were listed as extremes, the data from individual schools were researched to determine if there were exclusionary characteristics. For example, when a school was identified within the lowest economic stratum that yielded a high statistical PSSE, I reviewed the data to ensure the school did not have an application process for enrollment based on academic ability such as existed for magnet schools.

Table 14

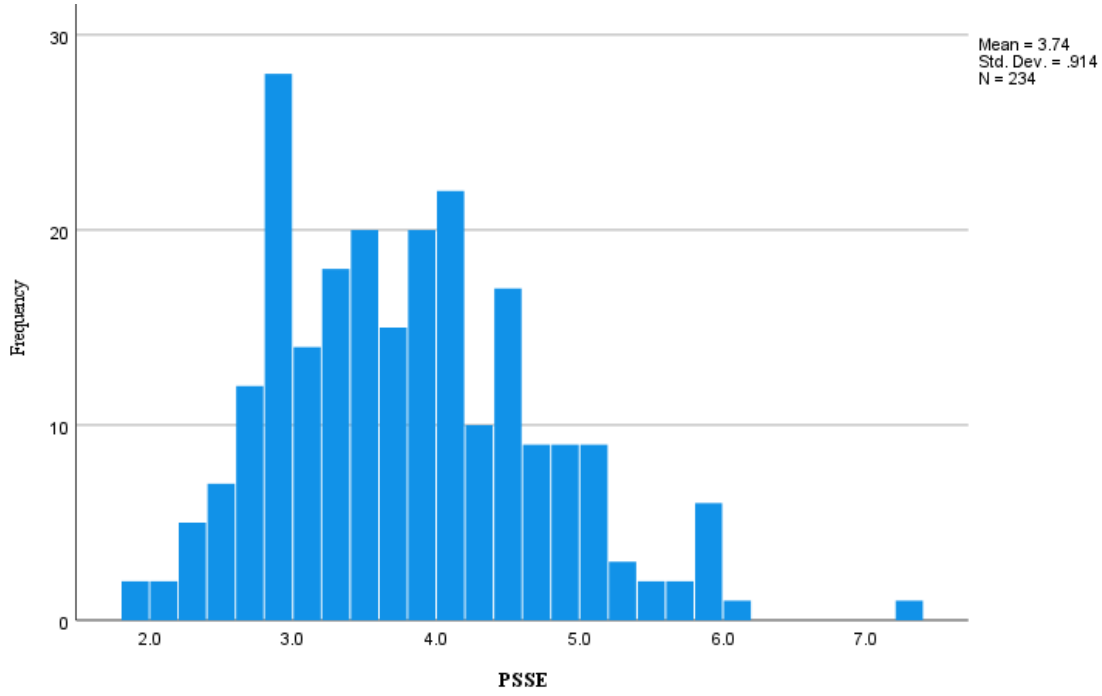
Descriptive Statistics for Independent Variable PSSE

			Statistic	Std. Error
PSSE	Mean		3.740	.0597
	95% Confidence Interval for Mean	Lower Bound	3.622	
		Upper Bound	3.857	
	5% Trimmed Mean		3.706	
	Median		3.700	
	Variance		.835	
	Std. Deviation		.9140	
	Minimum		1.9	
	Maximum		7.2	
	Range		5.3	
	Interquartile Range		1.4	
	Skewness		.541	.159
	Kurtosis		.233	.317

There is a difference of .034 (3.740 – 3.706) when the 5% trimmed mean is compared to the original mean, and the analysis determined that extreme scores did not have a strong influence on the mean. To assess normality within the independent variable, PSSE, I used the approach recommended by Tabachnick and Fidell (2013) who discovered that, for distribution of large samples (200+ cases), it was best to use a histogram to assess normality of the distribution. Figure 4 displays the actual shape of the distribution which revealed that the scores appeared to be reasonably normally distributed.

Figure 4

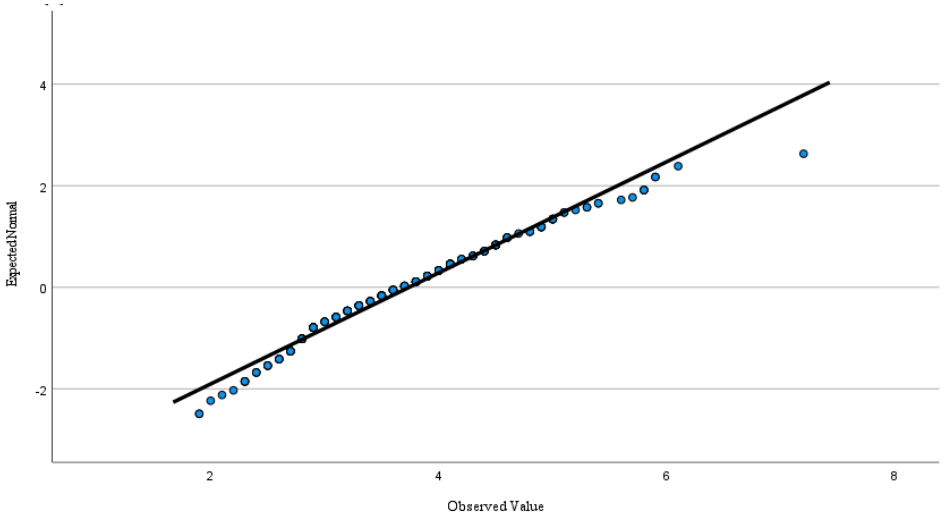
Distribution of PSSE Using Histogram



The results of the inspection of the histogram was supported by the normal probability plot which revealed a reasonably straight line suggesting a normal distribution. Figure 5 displays the normal Q-Q Plot of PSSE. In reviewing the plot, two extreme points were identified in the preliminary analysis. One extreme value for PSSE (7.2) represented Northern Middle School within Garret County Public Schools, and the second extreme point (6.5) represented Mount View Middle School within Howard County Public Schools. Northern Middle School, which was found to have an economic disadvantaged percent enrollment of 43.6%, remained in the study. Mount View School, which was found to have an enrollment of economically impacted students observed below 5%, met the exclusion criteria and was removed from the sample. After the exclusion of Mount View School, Hampden Middle Schools in Baltimore City had an extreme point (6.1) but remained in the study.

Figure 5

Normal Q-Q Plot of PSSE



In summary, based on the histogram analysis, the PSSE scores were determined to be reasonably normally distributed. This conclusion was also supported by an inspection of the normal probability plot in Figure 5. Table 15 provides the Kolmogorov-Smirnov statistics which is a useful nonparametric method for testing for normality. The results also suggest normality of the study sample.

Table 15

Tests of Normality for PSSE

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PSSE	.065	234	.018	.977	234	<.001

Overall Literacy Achievement of Students (OLA), Dependent Variable

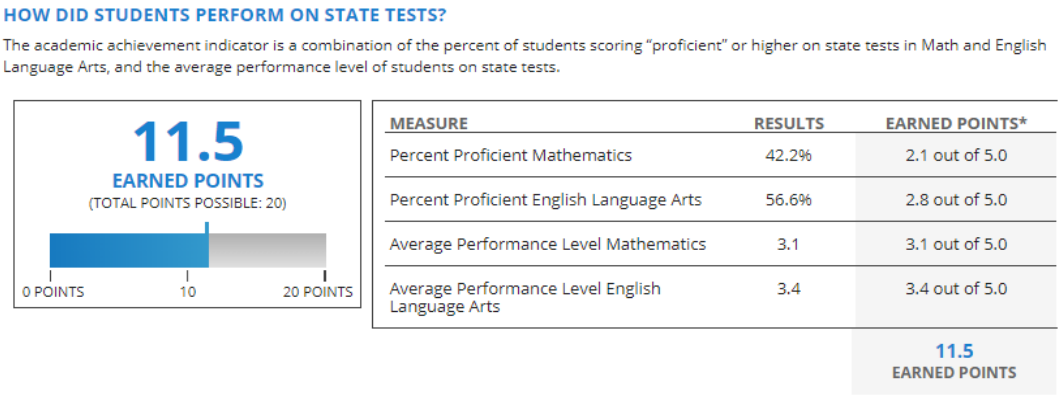
An assumption of this study was that literacy is a key content area for unlocking success in all school subjects. For the most impacted group, success in literacy can mitigate challenges in

the comprehension-based areas of the curriculum (Alverman, 2005). When students fall behind their peers in literacy development, intervention efforts are implemented by schools to address underachievement. Although intervention methods are necessary, often these methods include additional classes, after school classes, computer intervention at the back of the classroom which can make a student feel isolated (Fisher & Frey, 2007).

This variable, literacy achievement, is dependent on the percentage of students scoring *proficient* or higher on the MCAP assessment, specifically on assessments in English language arts. On state tests in English language arts, *proficient* or higher constitutes performance level 4 or 5. (On the MCAP assessment, *proficient* or higher is performance level 3 or 4). Figure 6 displays an example of how school data are displayed on the public MSDE website. The data for overall student achievement in language arts was derived from the percent proficient in English language arts by school. In Figure 6 the percentage result is listed in the third row under results which can be retrieved by school.

Figure 6

Academic Achievement for Middle Schools as Displayed on the MSDE website



HOW DID STUDENTS PERFORM ON STATE TESTS?

The academic achievement indicator is a combination of the percent of students scoring "proficient" or higher on state tests in Math and English Language Arts, and the average performance level of students on state tests.

11.5
EARNED POINTS
(TOTAL POINTS POSSIBLE: 20)

0 POINTS 10 20 POINTS

MEASURE	RESULTS	EARNED POINTS*
Percent Proficient Mathematics	42.2%	2.1 out of 5.0
Percent Proficient English Language Arts	56.6%	2.8 out of 5.0
Average Performance Level Mathematics	3.1	3.1 out of 5.0
Average Performance Level English Language Arts	3.4	3.4 out of 5.0
		11.5 EARNED POINTS

Note. Taken from the Maryland State Department of Education's (MSDE) public website at https://reportcard.msde.maryland.gov/.

Table 16 displays descriptive statistics for the mean, median, and standard deviation for the overall literacy achievement of all schools within the study. The table also provides distribution information (minimum and maximum) of the scores. In the output presented above, information from SPSS is summarized. For the variable overall literacy achievement (OLA), the information from 234 schools ranges from a school average proficiency score of 2.5% to 82.4% on the MCAP assessment with a mean of 41.04% and standard deviation of 19.72%.

Table 16

Measures of Variation for Overall Literacy Achievement

	Statistic					Skewness		Kurtosis	
	N	Mini-mum	Maxi-mum	Mean	Std. Deviation	Statistic	Std. Error	Statistic	Std. Error
OLA	234	2.5	82.4	41.042	19.7236	.020	.159	-.941	.371
Valid N (listwise)	234								

Positive skewness indicated that scores were clustered to the left at the low values which suggested low achievement below the mean for most schools. Negative kurtosis indicated the distribution is relatively flat. Table 17 provides the statistics used to determine the 5% trimmed mean comparison as well as the median for the variation statistics for OLA.

Table 17

Descriptive Statistics for Dependent Variable OLA

			Statistic	Std. Error
OLA	Mean		41.042	1.2894
	95% Confidence Interval for Mean	Lower Bound	38.502	
		Upper Bound	43.582	
	5% Trimmed Mean		40.980	
	Median		40.750	
	Variance		389.020	
	Std. Deviation		19.7236	
	Minimum		2.5	
	Maximum		82.4	
	Range		79.9	
	Interquartile Range		34.3	
	Skewness		.020	.159
	Kurtosis		-.941	.317

Comparing the 5% trimmed mean to the original mean reveals a difference of .062 (41.042 – 40.034), and, based on this analysis, it was determined extreme scores did not have a strong influence on the mean. In order to assess normality within the dependent variable OLA, I again used the procedure proposed by Tabachnick and Fidell (2013) for review of distribution of large samples which was to use a histogram to assess normality of the distribution. In Table 18, the extreme value statistics observed for all 5 values are listed with the highest levels of overall literacy achievement (OLA) which were each within the highest economic stratum four. The schools were Robert Frost (Montgomery County) 82.4, Glenwood (Howard County) 80.9, Urbana (Frederick County) 79.3, Cabin John (Montgomery County) 79.1, and Northern Middle (Calvert County) 77.6.

The lowest school data for overall literacy achievement was in the economic stratum of one with the exception of Cherry Hill Elementary/Middle which is identified in economic

stratum two middle economic area ($71,908.00 - $91,607.00). This school was in economic stratum three, upper middle economic area ($91,608.00 - $121,772.75). All other five schools were observed in economic stratum one; all five of the lowest performing were identified as the Baltimore City schools (Baltimore City School Public Schools, n.d.).

Table 18

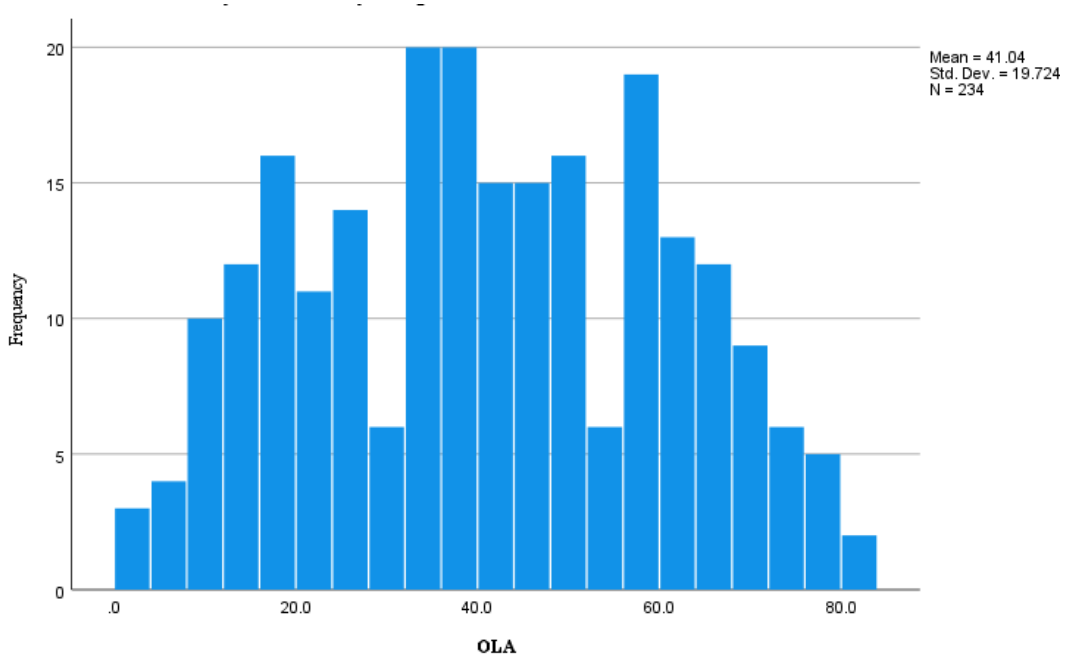
Extreme Values of Overall Literacy Achievement

			Case Number	ECOZ4	Value
Overall Literacy Achievement (OLA)	Highest	1	194	4	82.4
		2	229	4	80.9
		3	198	4	79.3
		4	230	4	79.1
		5	209	4	77.6
	Lowest	1	9	3	2.5
		2	7	1	3.0
		3	91	1	3.5
		4	12	2	4.3
		5	26	1	5.5

Normality was assessed within the dependent variable OLA. I again used the procedure of Tabachnick and Fidell (2013) for review of distributions of large samples which uses a histogram to assess normality of the distribution. The actual shape of the distribution is displayed in Figure 7 and the scores appear to be reasonably normally distributed.

Figure 7

Distribution of Overall Literacy Achievement by Histogram



This analysis is supported by the normal probability plot seen in Figure 8 which, along with the histogram, revealed a reasonably strait line suggesting a normal distribution. Both Figure 7 and Figure 8 were used to check for any extreme points. Kolmogorov-Smirnov statistics are provided in Table 19.

Figure 8

Normal Q-Q Plot of OLA

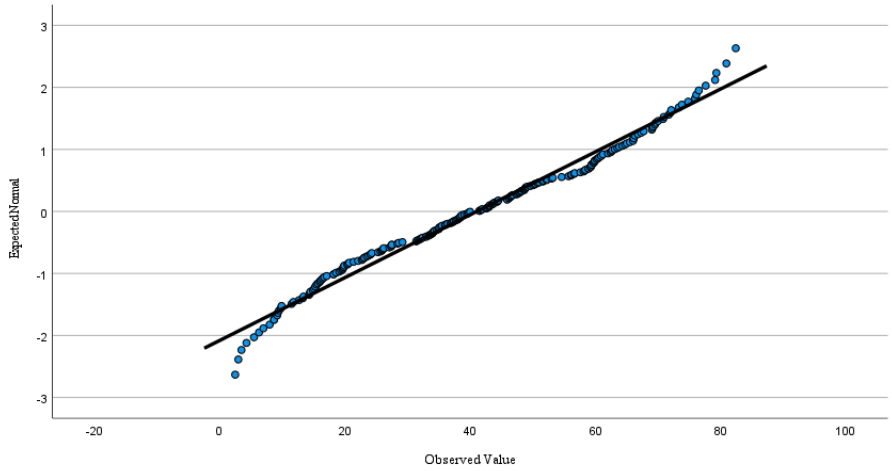


Table 19

Tests of Normality for OLA

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
OLA	.067	234	.012	.977	234	<.001

Economically Impacted Literacy Achievement of Students (EILA), Dependent Variable

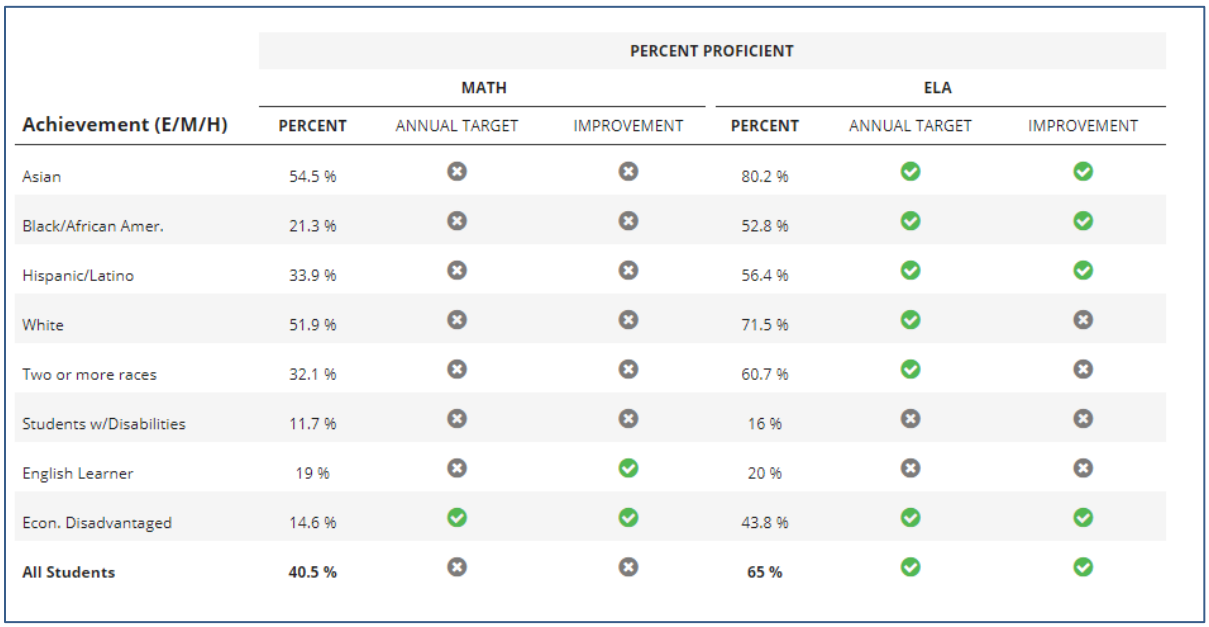
The data for EILA, a dependent variable in this study, consisted of the percentage of students scoring proficient in Maryland middle schools identified by their local school districts as eligible to receive free or reduced-price meals (FARMS) through direct application. The data for this variable were retrieved from the MSDE website and based on school data from the spring of 2019 MCAP literacy assessment. To be identified as economically impacted, a student's household income must not exceed 185% of the federally designated poverty threshold for a comparably size family living in a similar geographic area (Food and Nutrition Services, 2015). Maryland also has other conditions to qualify students for FARMS. All children in households receiving benefits from the Food Supplement Program (FSP) or from the Temporary Cash Assistance (TCA) Program are eligible to receive free meals at school regardless of parent income.

The data for overall student achievement in language arts was taken from the percentage of students proficient in English language arts. In Figure 9, the percentage result is listed in the third row under results and can be retrieved by school. During the pre-analysis of data, six schools from two counties were marked as excluded due to their enrollment of the subgroup being less than 5% of the total school enrollment. As indicated earlier, 6 schools (4 from Howard County schools and 2 from Montgomery County schools) did not meet eligibility. These excluded schools are included in Appendix E.

The 2019 data for this variable, as shown in Figure 9, was retrieved from the MSDE website under the percentage proficient for English language arts for the economically disadvantaged group. Based on the 2016 census information, the number of students under the age of 18 living in poverty was 31% for Black students, 26% for Hispanic students, and 10% for White and Asian students (National Center of Education Statistics, 2017).

Figure 9

Sample of Literacy Achievement by Middle School Disaggregated



	PERCENT PROFICIENT					
	MATH			ELA		
Achievement (E/M/H)	**PERCENT**	ANNUAL TARGET	IMPROVEMENT	**PERCENT**	ANNUAL TARGET	IMPROVEMENT
Asian	54.5 %	✗	✗	80.2 %	✓	✓
Black/African Amer.	21.3 %	✗	✗	52.8 %	✓	✓
Hispanic/Latino	33.9 %	✗	✗	56.4 %	✓	✓
White	51.9 %	✗	✗	71.5 %	✓	✗
Two or more races	32.1 %	✗	✗	60.7 %	✓	✗
Students w/Disabilities	11.7 %	✗	✗	16 %	✗	✗
English Learner	19 %	✗	✓	20 %	✗	✗
Econ. Disadvantaged	14.6 %	✓	✓	43.8 %	✓	✓
All Students	**40.5 %**	✗	✗	**65 %**	✓	✓

Note. Taken from the Maryland Report Card (https://reportcard.msde.maryland.gov/)

Table 20 displays descriptive statistics, including the mean, median, and standard deviation, for the literacy achievement of the economically impacted groups within all study schools. This data also provided distribution information (minimum and maximum) concerning the scores. The analyses were conducted using SPSS. For the variable, economically impacted literacy achievement (EILA), the data from 234 schools ranged from a school average

proficiency score of 0.9% to 80 % on the literacy achievement portion of the MCAP assessment, with a mean of 25.31% and a standard deviation of 12.88.

Table 20

Measures of Variation for Economically Impacted Literacy Achievement

	Statistics					Skewness		Kurtosis	
	N	Mini mum	Maxi- mum	Mean	Std. Deviation	Statistic	Std. Error	Statistic	Std. Error
EILA	234	.9	80.0	25.318	12.8855	688	.159	.685	.317
Valid N (listwise)	234								

Positive skewness indicated the scores were clustered to the left at the low values which suggested low achievement below the mean for most schools. Positive kurtosis indicated the distribution was rather peaked, clustered in the center and with long thin tails.

Table 21 displays data and provides the statistics used to determine the 5% trimmed mean comparison as well as the median for the variation statistics for EILA. Comparing the 5% trimmed mean to the original mean revealed a difference of .487 (25.318 – 24.831). Based on this analysis, it was determined that extreme scores were not having a strong influence on the mean.

Table 21

Descriptive Statistics for Dependent Variable EILA

			Statistic	Std. Error
EILA	Mean		25.318	.8424
	95% Confidence Interval for Mean	Lower Bound	23.658	
		Upper Bound	26.977	
	5% Trimmed Mean		24.831	
	Median		23.000	
	Variance		166.036	
	Std. Deviation		12.8855	
	Minimum		.9	
	Maximum		80.0	
	Range		79.1	
	Interquartile Range		17.8	
	Skewness		.688	.159
	Kurtosis		.685	.317

Table 22 displays the extreme value statistics for EILA which included three schools in the upper economic stratum (≥ $121,773.75) and two in the middle-income economic stratum ($71,908.00 - $91,607.00). The three schools with extreme values for EILA in the upper stratum were: Robert Frost (Montgomery County) 58.8%, Glenwood (Howard County) 80.0%, and Northern Middle (Calvert County) 55.9%. These three schools also listed within the top five highest in the previous exploration of overall literacy achievement, and they fell into the highest economic stratum. Two schools with extreme values for EILA in the middle economic stratum two were Stephen Decatur (Worcester County) and Smithsburg (Washington County). These two schools were listed among the high achievement bands within the EILA group. It is worth noting the difference in the percentage of enrollment of the subgroup of the two schools compared to the other three schools arriving in the highest performance.

Table 22

Extreme Values for Economically Impacted Literacy Achievement

			Case Number	Value
EILA	Highest	1	229	80.0
		2	194	58.8
		3	209	55.9
		4	77	55.3
		5	100	54.8
	Lowest	1	9	.9
		2	107	1.6
		3	7	2.4
		4	91	2.6
		5	63	3.0

Table 23 displays the five schools with the lowest extreme value statistics with enrollment percentages of economically impacted students exceeding 70% and observed achievement below 5%. Table 24 displays these five schools and their achievement percentage for subgroup EILA.

Table 23

Schools in Highest Band of Schools with Percentage of FARMS Enrolled and Associated EILA

School	District	Stratum	Students Identified as Economically Impacted	Achievement Percentage for the Subgroup EILA
Stephen Decatur Middle School	Worcester County Public Schools	2	33.6%	55.3%
Smithsburg Middle School	Washington County Public Schools	2	37.9%	54.8%
Robert Frost Middle School	Montgomery County Public Schools	1	5.9%	58.8%
Glenwood Middle School	Howard County Public Schools	1	8.4%	80.0%
Northern Middle School (	Calvert County Public Schools	1	9.5%	55.9%.

Table 24

Schools in Lowest Band with Percentage of FARMS Enrolled with Associated EILA

School	District	Stratum	Students Identified as Economically Impacted	Achievement Percentage for Subgroup EILA
Calverton Elementary/Middle	Baltimore City Public Schools	1	76.8%	.9%
Harlem Park Elementary/Middle	Baltimore City Public Schools	1	82.4%	.9%
Westport Academy	Baltimore City Public Schools	2	74.7%	1.6%
Cherry Hill Elementary/Middle	Baltimore City Public Schools	2	79.6%	2.6%
Charles Carroll Middle School	Prince George's County Public Schools	2	81.9%	3.0%

Normality of the variable was assessed within the dependent variable OLA using a histogram as recommended by Tabachnick and Fidell (2013) for reviewing distribution of large samples of 200+ cases. The actual shape of the distribution is displayed in Figure 10 indicating the scores appear to be reasonably normally distributed. This analysis is supported by the normal probability plot which suggest a reasonably strait line suggesting a normal distribution. Both Figure 10 and Figure 11 were used to check for any extreme points. Kolmogorov-Smirnov statistics are provided in Table 25.

Figure 10

Distribution of Overall Literacy Achievement by Histogram

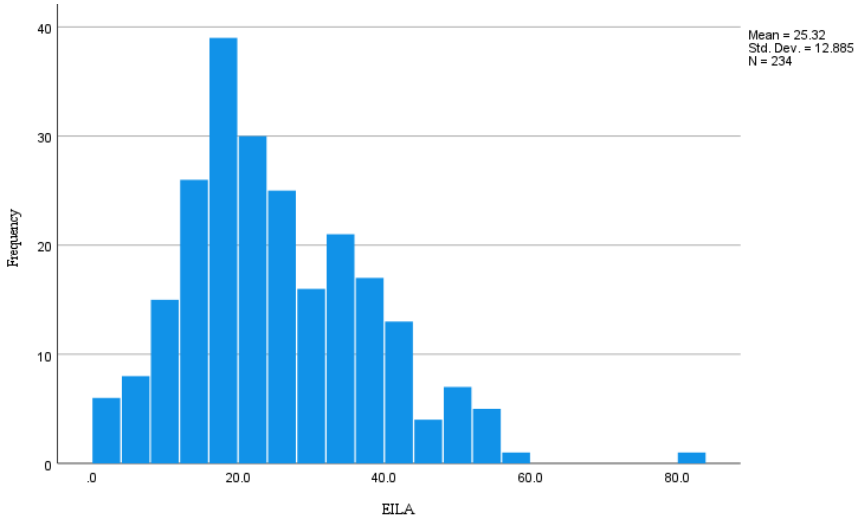


Figure 11

Normal Q-Q Plot of EILA

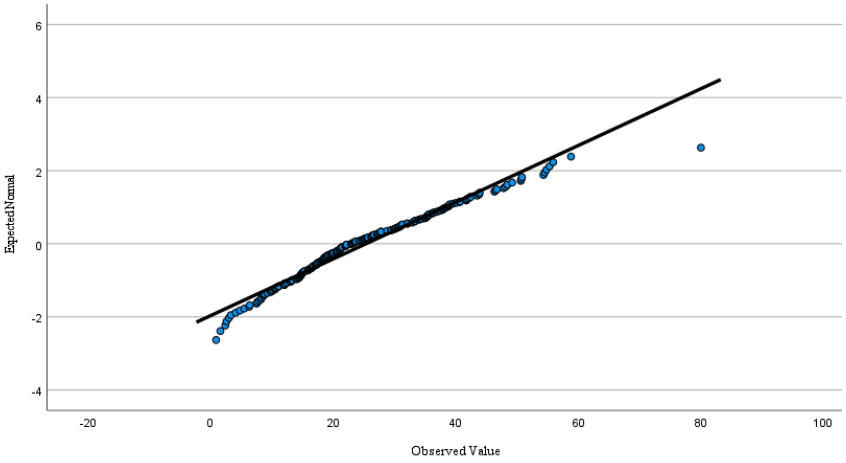


Table 25

Tests of Normality for EILA

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EILA	.091	234	<.001	.969	234	<.001

Non-Economically Impacted Literacy Achievement of Students (NILA), Dependent Variable

To determine the influence of the economic moderator on the association between PSSE and literacy achievement, it was important to note the relationship between the two variables for the students who were not impacted by poverty. This approach allowed ruling out increasingly numerous rival hypotheses regarding what factors could have caused the observed strength or weakening of association for the literacy achievement of the economically impacted. When significant influence or associations were observed, the possibility that the predictor caused the change was supported. Numerous other possible reasons for the change also exist such as other factors associated with poverty. Thus, control conditions were provided as well as disaggregating data by the unit of analysis of the achievement not associated with poverty (Campbell & Stanley 1963).

Table 26 presents the results of the SPSS analysis of the measures of variation for the NILA. SPSS analysis of information on the NILA from 234 schools resulted in school average proficiency scores on the MCAP assessment from 5.6% to 82.8 % with a mean of 44.56% and a standard deviation of 19.93. Negative skewness suggested scores were clustered to the right at the high values which indicated achievement above the mean for most schools. Negative kurtosis indicated the distribution was rather flat which is highly probable with cases over 200.

Table 26

Measures of Variation for Non-Economically Impacted Literacy Achievement

	Statistics					Skewness		Kurtosis	
	N	Mini mum	Maxi- mum	Mean	Std. Deviation	Statistic	Std. Error	Statistic	Std. Error
EILA	234	5.6	82.8	44.567	19.9366	-.138	.159	-.961	.317
Valid N (listwise)	234								

Table 27 displays data and provides the statistics used to determine the 5% trimmed mean comparison as well as the median for the variation statistics for NILA. Comparing the 5% trimmed mean to the original mean resulted in the difference between 44.567 and 44.6868 of 0.1193. Based on this analysis, it was determined that extreme scores were not having a strong influence on the mean.

Table 27

Descriptive Statistics for Dependent Variable NILA

			Statistic	Std. Error
EILA	Mean		44.5675	1.30330
	95% Confidence Interval for Mean	Lower Bound	41.998	
		Upper Bound	47.1353	
	5% Trimmed Mean		44.6868	
	Median		46.5500	
	Variance		397.470	
	Std. Deviation		19.936	
	Minimum		5.60	
	Maximum		82.80	
	Range		77.20	
	Interquartile Range		33.83	
	Skewness		-.138	.159
	Kurtosis		-.961	.317

In order to assess normality of the distribution within the dependent variable NILA, a histogram was used to assess normality. Figure 12 displays the histogram and Figure 13 displays the Normal Q-Q Plot of NILA. As with the other variables, tests of normality for NILA were conducted using Kolmogorov-Smirnov and Shapiro-Wilk. Results are shown in Table 28.

Figure 12

Distribution of Non-Economically Impacted Literacy Achievement

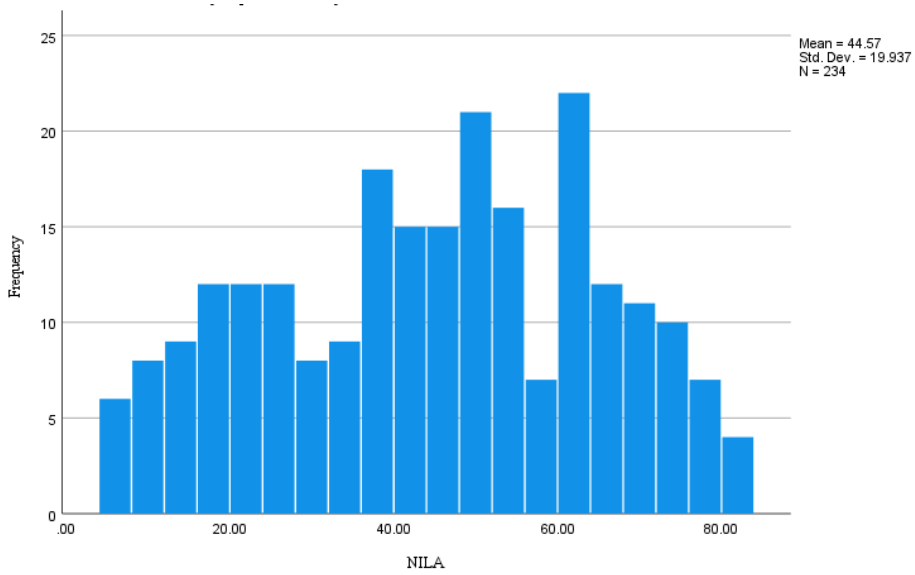


Figure 13

Normal Q-Q Plot of NILA

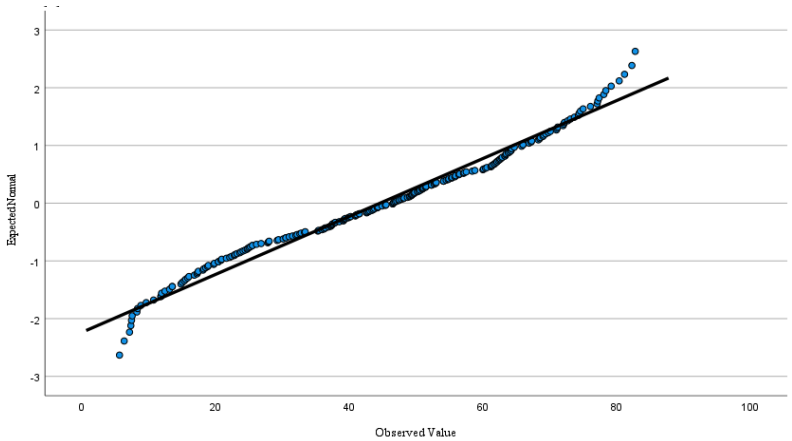


Table 28

Tests of Normality for NILA

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
EILA	.066	234	.016	.972	234	<.001

The results of the analysis to determine the extreme value statistics is displayed in Table 29. The highest extreme value statistics were found in three schools: Robert Frost (Montgomery County) 82.8%, Glenwood (Howard County) 81.2%, and Northern Middle (Calvert County) 79.2%.

Each of the three schools fell into the highest economic stratum. Two schools not identified in the exploration of the previous variable, but observed in NILA, were Cabin John Middle School (Montgomery County) and Urbana Middle School (Frederick County). All schools that posted high extreme values within this variable also were identified in the highest economic stratum.

The lowest extreme value statistics are displayed in Table 29. Five schools were identified with achievement of non-economically impacted students below 5%. Of the five schools posting the lowest values, three of the schools also posted the lowest extreme values within the NILA variable exploration. Table 30 includes the percentage of students identified as economically impacted along with the achievement percentage for the subgroup NILA.

Table 29

Extreme Values for Non-Economically Impacted Literacy Achievement

			Case Number	Value
NILA	Highest	1	194	82.8
		2	230	82.3
		3	229	81.2
		4	198	80.4
		5	209	79.2
	Lowest	1	7	5.6
		2	12	6.3
		3	91	7.1
		4	45	7.3
		5	26	7.4

Table 30

Schools in Lowest Band of Table 29 with Percentage of Enrolled Non-Economically Impacted with Associated NILA

School	District	Stratum	Students Identified as Non-Economically Impacted	Achievement Percentage for the Subgroup NILA
Baybrook Elementary/Middle	Baltimore City Public Schools	1	38.1%	6.1%
Wildwood Elementary/Middle	Baltimore City Public Schools	2	29.3%	7.4%
Harlem Park Elementary/Middle	Baltimore City Public Schools	1	52.2%	5.6%
Cherry Hill Elementary/Middle	Baltimore City Public Schools	2	20.4%	7.1%
Vanguard Collegiate Middle	Baltimore City Public Schools	2	20.4%	7.3%

Statistical Tests and Analyses

For the analyses, three different moderated multiple regressions were used to address the hypotheses related to the research questions. Before the presentation of the three moderated analyses, the procedures for testing assumptions are discussed. The appropriateness of data for moderated multiple regression is based on six assumptions: (a): independence of residuals, (b) lack of multicollinearity, (c) a linear relationship between the dependent variable and each independent variable, (d) homoscedasticity of residuals, (e) no significant outliers, and (f) normality (Laered Statistics, n.d.).

Preliminary Tests

Response Validity

Each model included one independent variable, one moderating variable, and one dependent variable, that were used to estimate the sample size required for the moderated multiple regression test following the G*Power 3.1 Manual (Buchner, 2017). The moderate effect size f^2 with an α of .05 and a power $(1 - \beta)$ of .95 requires a sample size of 138. Therefore, the study sample size of 234 surpassed the criteria for analyzing a moderate R^2 change using moderated multiple regression as the primary statistical test.

Independence of Residual

The Durbin-Watson statistic was used to determine if the assumption of independence of residuals was met. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation. Table 31 displays the Durbin-Watson statistic provided for each of the three analyses conditions of non-autocorrelation (Durbin-Watson, n.d.).

Table 31

Durbin-Watson Test for Moderated Analysis I, II, and II

Models	Durbin-Watson
Moderated Analysis I	2.007
Moderated Analysis II	2.109
Moderated Analysis III	2.060

Multicollinearity

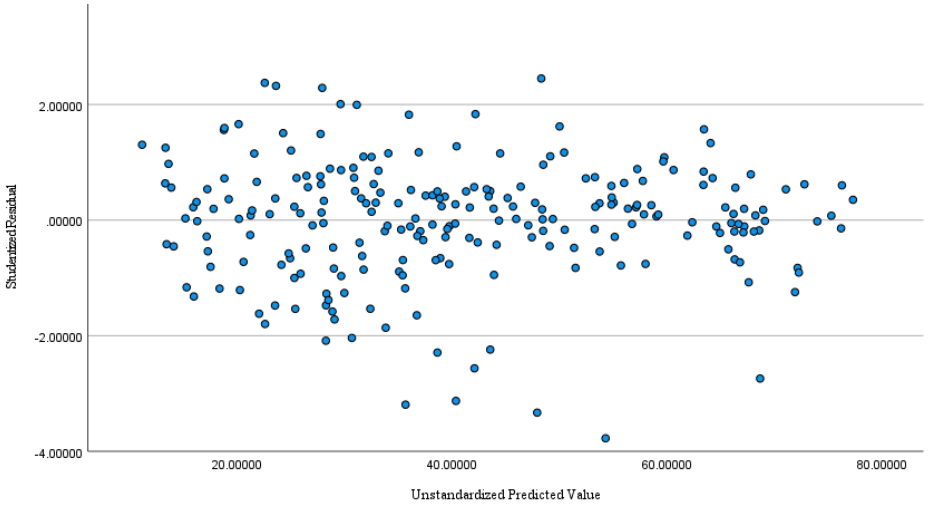
Multicollinearity was assessed using the variance inflation factor (VIF) and tolerance values. No evidence of multicollinearity was found as evidenced by no tolerance values less than 0.456 and no VIF value greater than 2.195.

Linearity

Linearity was assessed for the model based on visual inspection of the plot of studentized residuals versus unstandardized predicted values. The plot for the model is displayed in Figure 14. Linearity was also assessed by visual inspection of partial regression plots for each combination of independent and dependent variable.

Figure 14

Scatter Plot of Studentized Residual by Unstandardized Predicted Value



Homoscedasticity

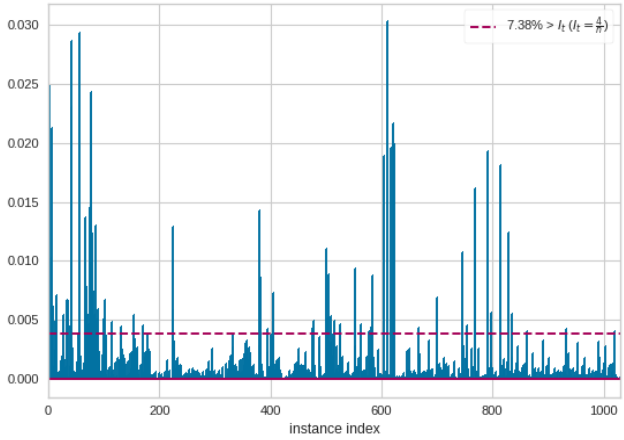
Homoscedasticity exists when the residual error distribution is consistent across values of the independent variables. Homoscedasticity was assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values.

Significant Outliers

Outliers were identified based on inspection of studentized deleted residuals greater than ±3. Four outliers were identified and, due to the points also being identified as high leverage, the four data points were removed from the model. Other points identified as outliers, but not leverage values, remained within the model. Each outlier was assessed for influence using Cook's distance formula. Results are shown in Figure 15.

Figure 15

Cook's Distance Outlier Detection



Moderated Multiple Regression (MMR) Analyses

Moderated Analysis I

The first moderated analysis addressed hypothesis H1A and H2A. The hypotheses were tested using a moderated multiple regression statistical test in SPSS. The moderated analysis was used to determine if there was an association between the continuous independent variable (PSSE) and the continuous dependent variable (OLA). The relationship between the two variables was moderated by a third independent variable, the product of the PSSE score and economics of the school serving area (ECOZ).

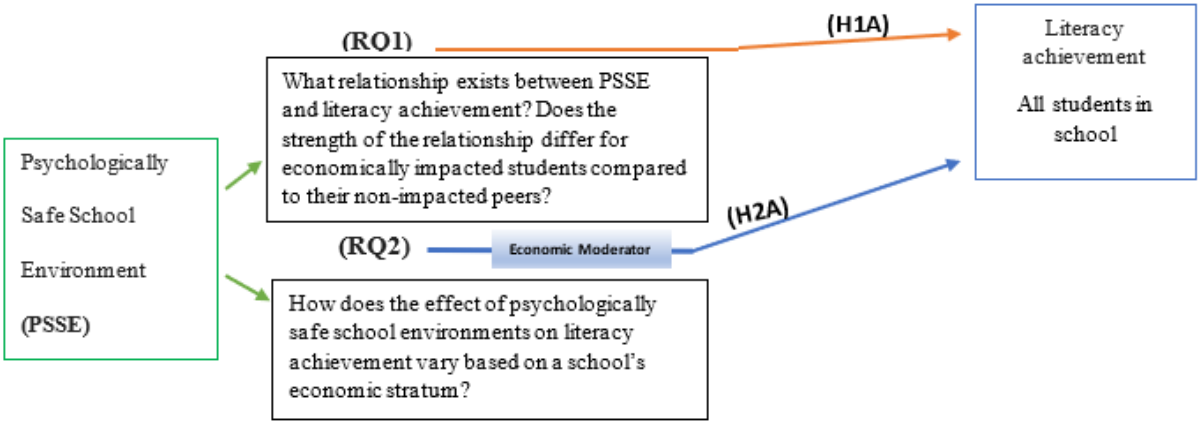
Moderated Analysis I is associated with Figure 16 and addressed the two research questions stated within the conceptual map.

- Hypotheses to address RQ1:
    - H1A: There is a correlation between overall psychologically safe school environment (PSSE) scores and literacy achievement scores of all students.

- Hypotheses to address RQ2:
    - H2A: Economic stratum will moderate the relationship between psychologically safe school environments literacy achievement scores of all students.

Figure 16

Moderated Analysis I



Moderated Analysis I was conducted using SPSS and placing the independent variable PSSE score in block 1 and placing the product of the PSSE score and the economic moderator (ECOZ) in block 2. The dependent variable in each block was overall literacy achievement (OLA).

Four schools were excluded from the analysis for correlations based on being outliers and having significant leverage values. The remaining 230 schools were placed into a moderated multiple regression (MMR) model. Table 32 displays the associations between variables which indicated the size of the value of the correlation coefficient which can range from -1 to 1. Cohen (1988) suggested the following guidelines for determining the strength of the correlation: small r=.10 to.29, medium r=.30 to .49, and large .50 to 1.0. These guidelines apply for positive or negative r values.

Table 32

Correlations for Moderated Analysis for Overall Literacy Achievement

		OLA	PSSE	PSSE_X_ECOZ
Pearson Correlation	OLA	1.000	.592	.720
	PSSE	.592	1.000	.738
	PSSE_X_ECOZ	.720	.738	1.000
Sig. (1-tailed)	OLA	.	.000	.000
	PSSE	.000	.	.000
	PSSE_X_ECOZ	.000	.000	.
N	OLA	230	230	230
	PSSE	230	230	230
	PSSE_X_ECOZ	230	230	230

The Pearson product-moment correlation coefficient was used to investigate the relationship between the PSSE, as measured by the Maryland student survey, and overall literacy achievement (OLA), as measured by the MCAP assessment. There was a strong, positive correlation between the two variables ($r = .592$, $n = 230$, $p<.0005$) with high levels of PSSE associated with high levels of overall literacy achievement (OLA). **Therefore, the hypothesis (H1A), there is a correlation between overall psychologically safe school environment (PSSE) scores and literacy achievement scores of all students, is accepted.**

In Table 33, the relationship of the moderator (PSSE_X_ECOZ) [the product of the PSSE score and the economic moderator (ECOZ)] and overall literacy achievement (OLA) as measured by the MCAP assessment was investigated using Pearson product-moment correlation coefficient. There was a strong, positive correlation between the two variables [$r = .720$, $n = 230$, $p<.0005$] with high levels of (PSSE_X_ECOZ) associated with high levels of overall literacy achievement (OLA). This value was higher than the PSSE alone which indicated a moderation. In order to gain a sense of how much variance was shared, the coefficient of determination was calculated by squaring the r value by itself and converting it to a percentage (Pallant, 2016).

Therefore, the hypothesis (H2A), the economic stratum will moderate the relationship between psychologically safe school environments and literacy achievement scores of all students is accepted due to the strength of the moderator which increased the correlation coefficient by .128. These results are shown in Table 31.

Table 33

Model Summary for Moderated Analysis I

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.592[a]	.351	.348	15.7152	.351	123.185	1	228	.000	
2	.726[b]	.527	.523	13.4441	.176	84.539	1	227	.000	2.007

The moderated analysis used data from Table 34 in order of importance (according to the beta values). The results indicated that both variables, PSSE and the moderated PSSE_X_ECOZ, made a unique, statistically significant contribution to overall literacy achievement with the (beta = .592, p<.0005) in the first model and with the addition of the moderator which encompassed the variable a (beta = .726, p<.005).

Table 34

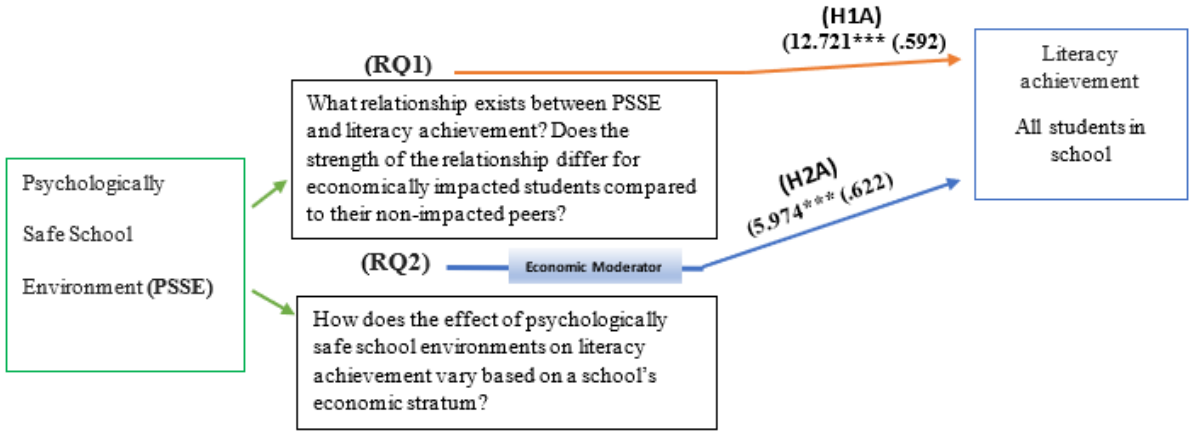
Coefficients Summary for Moderated Analysis I

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
	Model	B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-5.949	4.405		-1.350	.178					
	PSSE	12.721	1.146	.592	11.099	.000	.592	.592	.592	1.000	1.000
2	(Constant)	8.093	4.066		1.990	.048					
	PSSE	2.866	1.453	.133	1.973	.050	.592	.130	.090	.456	2.195
	PSSE_X_ECOZ	5.974E-5	.000	.622	9.194	.000	.720	.521	.420	.456	2.195

In the final model, the product of PSSE and the economics of the school by zip code (ECOZ) was used as a moderator (beta = .622, p<.0005). Note that these beta values represent the unique contribution of each variable after overlapping effects of other variables are statistically removed (Pallant, 2016). Figure 17 displays the conceptual map of this moderated analysis with the statistical results.

Figure 17

Moderated Analysis I



Note. Unstandardized coefficient β (Standardized Coefficient β.) N=230. ***p<.0005

In Table 34, an examination of the Part correlation coefficients provided an indication of the contribution of each variable to the total R squared. When the value by itself was squared, in the final block 2, it shows that (PSSE_X_ECOZ) has a Part correlation coefficient of .420 and when squared equals .176. This indicates that the moderator had a 17.6% unique contribution to the explanation of variance in overall literacy achievement. The Part correlation coefficient for PSSE of .592 when squared is .350. This indicates that PSSE has a 35% unique contribution to the explanation of variance in overall literacy achievement.

Moderated Analysis II

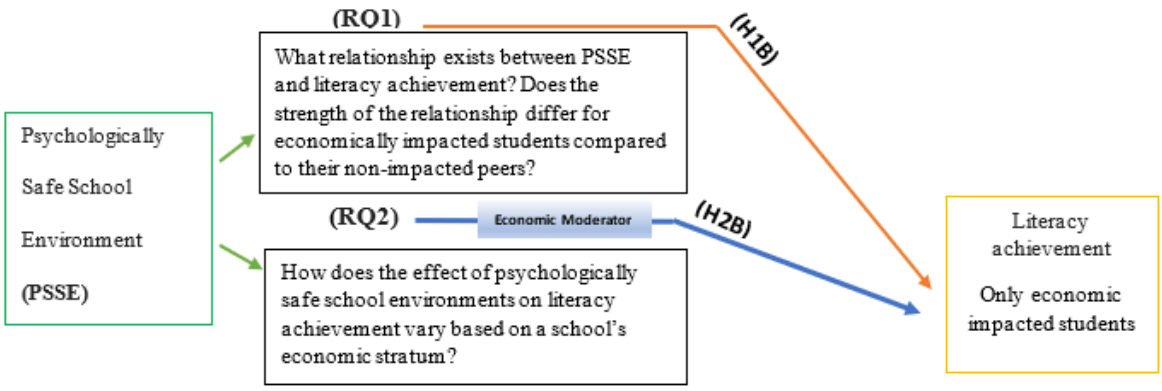
The second moderated analysis addressed hypothesis H1B and H2B. The hypotheses were tested using a moderated multiple regression (MMR) statistical test in SPSS. The moderated analysis was used to determine if there was an association between the continuous independent variable (PSSE) and the continuous dependent variable (EILA). The relationship between the two variables was moderated by a third variable, the product of PSSE and ECOZ, the economics of the school serving area.

Moderated Analysis II, displayed in Figure 18, addressed the two hypotheses stated within the conceptual map.

- Hypotheses to address RQ1:
    - H1B: There will be a correlation between PSSE scores and specifically literacy achievement scores of economically impacted students.
- Hypotheses to address RQ2:
    - H2B: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically impacted students.

Figure 18

Moderated Analysis II



Moderated Analysis II was analyzed using SPSS by placing the independent variable, the PSSE score, in block 1and the product of the PSSE score and the economic moderator (ECOZ) in block 2. The dependent variable in both blocks was economically impacted literacy achievement (EILA).

Four schools were excluded from the analysis for correlations based on being outliers and having significant leverage values. The remaining 230 schools were placed in a moderated multiple regression (MMR) model. Table 35 displays the associations between variables revealing the size of the value of the correlation coefficient which can range from -1 to 1. Guidelines (Cohen, 1988) for the association indicate that small r=.10 to.29, medium r=.30 to .49, and large r= .50 to 1.0. These guidelines apply for positive or negative r values.

Table 35

Correlations for Moderated Analysis II for Economically Impacted Literacy Achievement

		EILA	PSSE	PSSE_X_ECOZ
Pearson Correlation	EILA	1.000	.549	.560
	PSSE	.549	1.000	.738
	PSSE_X_ECOZ	.560	.738	1.000
Sig. (1-tailed)	EILA	.	.000	.000
	PSSE	.000	.	.000
	PSSE_X_ECOZ	.000	.000	.
N	EILA	230	230	230
	PSSE	230	230	230
	PSSE_X_ECOZ	230	230	230

In Table 35, the relationship between psychologically safe school environment (PSSE), as measured by the Maryland student survey, and economically impacted literacy achievement (EILA) as measured by the MCAP assessment was investigated using Pearson product-moment correlation coefficient. There was a strong, positive correlation between the two variables [r= .549, n = 230, p<.0005] with high levels of (PSSE) associated with high levels of economically impacted literacy achievement (EILA). **Therefore, the hypothesis (H1B), there will be a correlation between PSSE scores and specifically literacy achievement scores of economically impacted students, is accepted.**

The Pearson product-moment correlation coefficient was used to investigate the relationship of the moderator (PSSE_X_ECOZ) and economically impacted literacy achievement (EILA) as measured by the MCAP. As shown in Table 35, there was a strong, positive correlation between the two variables [r = .560, n = 230, p<.0005] with high levels of (PSSE_X_ECOZ) associated with high levels of economically impacted literacy achievement (EILA). **Therefore, the hypothesis (H2B), economic stratum will moderate the relationship**

between PSSE on the literacy achievement scores of economically impacted students, is accepted. The moderator increased the correlation coefficient by .011.

In order to gain a sense of how much variance is shared, the coefficient of determination was calculated by squaring the r value by itself and converting it to a percentage (Pallant, 2016). The PSSE score helped to explain nearly 30.1% of the variance in economically impacted literacy achievement within this model. The moderator (PSSE_X_ECOZ) helped to explain nearly 31.3% of the variance in overall literacy achievement within the Maryland middle schools in this study. The model summary is included in Table 36.

Table 36

Model Summary for Moderated Analysis II

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.549[a]	.301	.298	10.7277	.301	98.126	1	228	.000	
2	.595[b]	.354	.348	10.3377	.053	18.527	1	227	.000	2.109

In the moderated analysis, data from Table 37 was used in order of importance according to their beta values, both variables make a unique statistically significant contribution to economically impacted student achievement with PSSE (beta = .549, p<.0005) and PSSE_X_ECOZ (beta = .595, p<.0005).

Table 37

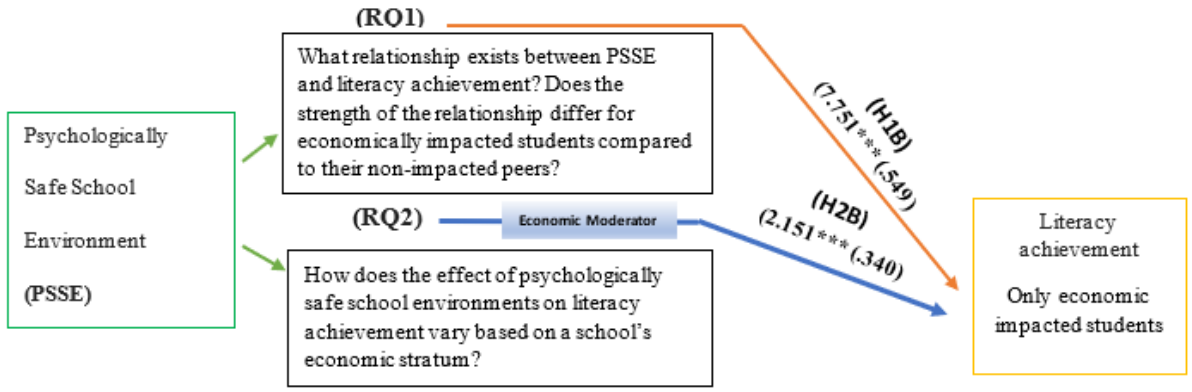
Coefficients Summary for Moderated Analysis II

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-3.353	3.007		-1.115	.266					
	PSSE	7.751	.782	.549	9.906	.000	.549	.549	.549	1.000	1.000
2	(Constant)	1.701	3.127		.544	.587					
	PSSE	4.203	1.117	.297	3.763	.000	.549	.242	.201	.456	2.195
	PSSE_X_ECOZ	2.151E-5	.000	.340	4.304	.000	.560	.275	.230	.456	2.195

In the final model, the product of PSSE and economics of the school by zip code (ECOZ) was used as a moderator (beta = .340, p<.0005). Note that these beta values represent the unique contribution of each variable after overlapping effects of other variables are statistically removed (Pallant, 2016). Figure 19 displays the conceptual map of this moderated analysis along with the statistical results.

Figure 19

Moderated Analysis II



Note. Unstandardized coefficient β (Standardized Coefficient β. N=230; ***p<.0005

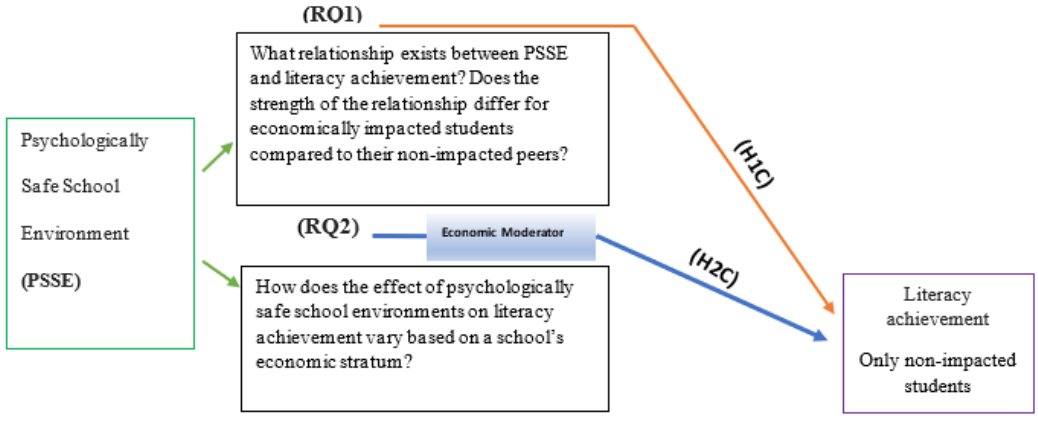
In Table 37, an examination of the Part correlation coefficients indicated the contribution of each variable to the total R square. If the value is squared by itself it shows, for example, in the final block 2 (PSSE_X_ECOZ) has a Part correlation coefficient of .230 and when squared =.0529. This provides the information that the moderator had a 5.2% unique contribution to the explanation of variance in economically impacted literacy achievement. PSSE had a partial correlation coefficient of .549 which indicated that psychologically safe school environment had a 30.1% unique contribution to the explanation of variance in economically impacted literacy achievement within the 230 Maryland middle schools in the study.

Moderated Analysis III

The third moderated analysis addressed hypothesis H1C and H2C as displayed in Figure 20. The hypotheses were tested using a moderated multiple regression statistical test in SPSS. The moderated analysis was used to determine if there was an association between the continuous independent variable (PSSE) and the continuous dependent variable (NILA) within the study. The relationship between the two variables was moderated by a third variable, the product of PSSE and economics of the school serving area (ECOZ).

Figure 20

Moderated Analysis III



Moderated Analysis III addressed the two hypotheses stated within the conceptual map:

- Hypotheses to address RQ1:
    - H1C: There will be a correlation between PSSE scores and specifically literacy achievement scores of non-economically impacted students.
- Hypotheses to address RQ2:
    - H2C: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically non-impacted students.

Moderated Analysis III was conducted using SPSS by placing the independent variable the PSSE score variables in block 1, the product of the PSSE score and the economic moderator (ECOZ) in block 2 (Pallant, 2016). The dependent variable in both blocks was non-economically impacted literacy achievement (NILA).

In analyzing the correlation, missing data represented 4 schools which were excluded based on being outliers and having significant leverage values. The remaining 230 schools were placed in a moderated multiple regression (MMR) model. Table 38 displays the associations between variables reflected in the size of the value of the correlation coefficient, which can range from -1 to 1. Cohen (1988) suggested the follow guidelines: small r=.10 to.29, medium r=.30 to .49, and large .50 to 1.0. These guidelines apply for positive or negative r values.

Table 38

Correlations for Moderated Analysis III for Non-economically Impacted Literacy Achievement

		NILA	PSSE	PSSE_X_ECOZ
Pearson Correlation	NILA	1.000	.555	.668
	PSSE	.555	1.000	.738
	PSSE_X_ECOZ	.668	.738	1.000
Sig. (1-tailed)	EILA	.	.000	.000
	PSSE	.000	.	.000
	PSSE_X_ECOZ	.000	.000	.
N	NILA	230	230	230
	PSSE	230	230	230
	PSSE_X_ECOZ	230	230	230

The Pearson product-moment correlation coefficient was used to investigate the relationship between PSSE, as measured by the Maryland student survey, and non-economically impacted literacy achievement (NILA) as measured by the MCAP. There was a strong, positive correlation between the two variables ($r = .555$, $n = 230$, $p<.0005$) with high levels of PSSE associated with high levels of non-economically impacted literacy achievement (NILA). **Therefore, the hypothesis H1C, there will be a correlation between PSSE scores and specifically literacy achievement scores of non-economically impacted students, is accepted.**

The Pearson product-moment correlation coefficient was used to investigate the relationship of the moderator (PSSE_X_ECOZ), the product of the PSSE score and the economic moderator (ECOZ), and non-economically impacted literacy achievement (NILA) as measured by the MCAP. As shown in Table 38, there was a strong, positive correlation between the two variables ($r = .668$, $n = 230$, $p<.0005$) with high levels of PSSE_X_ECOZ associated with high levels of NILA. **Therefore, the hypothesis H2C, the economic stratum will moderate the relationship between PSSE on the non-economically impacted achievement, is accepted.** The moderator increased the correlation of PSSE coefficient by .11.

In order to gain a sense of how much variance is shared, the coefficient of determination was calculated by squaring the r value by itself and converting it to a percentage (Pallant, 2016). The PSSE score helps to explain nearly 30.8% of the variance in non-economically impacted literacy achievement within this model. The moderator (PSSE_X_ECOZ) helps to explain nearly 44.6% of the variance in non-economically impacted literacy achievement within the Maryland middle schools in this study.

In the moderated analysis, using data shown in Table 39 in order of importance according to their beta values, both variables made a unique statistically significant contribution (less than .05). The PSSE has a beta = .555 ($p<.0005$) in the first model and naturally lost strength with the addition of the moderator which encompassed the variable.

Table 39

Model Summary for Moderated Analysis III

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.555[a]	.308	.305	16.36220	.308	101.552	1	228	.000	
2	.674[b]	.454	.449	14.56532	.146	60.725	1	227	.000	2.060

In the final model, the product of PSSE and economics of the school by zip code (ECOZ) is used as a moderator (beta = .566, $p<.0005$). Note that these beta values represent the unique contribution of each variable after overlapping effects of other variables are statistically removed (Pallant, 2016).

An examination of the Part correlation coefficients provided an indication of the contribution of each variable to the total R square as shown in Table 40. If the value by itself is squared, as shown in the final block 2, (PSSE_X_ECOZ) has a Part correlation coefficient of .382 and when squared it is .146. This indicates the moderator had a 14.6% unique

contribution to the explanation of variance in non-economically impacted literacy achievement. PSSE had a partial correlation coefficient of .555 which indicated that PSSE had a 30.8% unique contribution to the explanation of variance in non-economically impacted literacy achievement in the 230 Maryland middle schools included in the study.

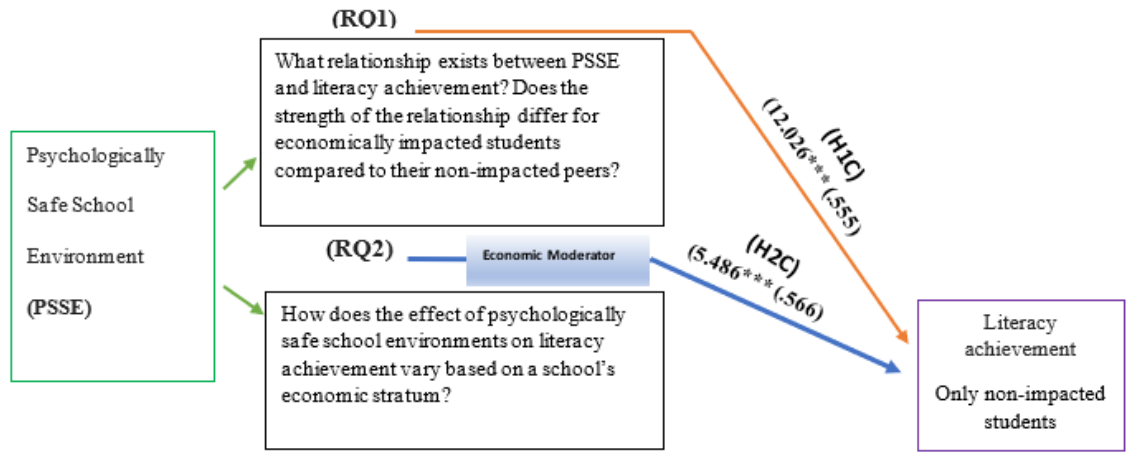
Table 40

Coefficients Summary for Moderated Analysis III

		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.206	4.587		.045	.964					
	PSSE	12.026	1.193	.555	10.077	.000	.555	.555	.555	1.000	1.000
2	(Constant)	13.100	4.406		2.973	.003					
	PSSE	2.977	1.574	.137	1.892	.060	.555	.125	.093	.456	2.195
	PSSE_X_ECOZ	5.486E-5	.000	.566	7.793	.000	.668	.459	.382	.456	2.195

Figure 21

Moderated Analysis III



Note. Unstandardized coefficient β (Standardized Coefficient β, N=230. ***p<.0005

Summary

This study examined the relationships between the independent variable, the psychologically safe school environment and the dependent variables, overall literacy achievement, economically impacted achievement, and non-economically impacted achievement. Archival data from 230 schools were used in the moderated multiple regression analysis to address the study research questions and hypotheses. Data eligibility testing was conducted. The study provided information that the economic moderator had a 17.6% unique contribution to the explanation of variance in overall literacy achievement. The statistical test provided information that the moderator had a 14.6% unique contribution to the explanation of variance in non-economically impacted literacy achievement (NILA). PSSE had a partial correlation coefficient of .555 which indicated that a psychologically safe school environment had a 30.8% unique contribution to the explanation of variance in non-economically impacted literacy achievement within the 230 Maryland middle schools in the study.

In examining PSSE with economically impacted literacy achievement performance by school, PSSE was found to have a statistically significant and strong relationship with economically impacted literacy achievement. PSSE had a 30.1% unique contribution to the explanation of variance in economically impacted literacy achievement within the 230 Maryland middle schools in the study. Table 41 summarizes the findings for hypotheses analyzed in this study.

Table 41

Summary of Findings

Hypotheses	Findings	Justification
H1A: There is a correlation between overall Psychological Safe School Environment (PSSE) scores and literacy achievement scores of all students.	Supported	Moderated Analysis I
H1B: There will be a correlation between PSSE scores and specifically literacy achievement scores of economically impacted students	Supported	Moderated Analysis II
H1C: There will be a correlation between PSSE scores and specifically literacy achievement scores of non-economically impacted students.	Supported	Moderated Analysis III
H2A: Economic stratum will moderate the relationship between Psychological Safe School Environments on literacy achievement.	Supported	Moderated Analysis I
H2B: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically impacted students	Supported	Moderated Analysis II
H2C: Economic stratum will moderate the relationship between PSSE on the literacy achievement scores of economically non-impacted students	Supported	Moderated Analysis III

Chapter 5 presents a discussion of findings. It also includes recommendations for future research. The chapter ends with conclusions.

CHAPTER 5 DISCUSSION

This chapter presents findings, recommendations, and conclusions. The chapter is divided into sections: findings of study, discussion highlighting significance of findings, implications, recommendation for practice, recommendations for future research, and final conclusions.

Findings

Research question one (RQ1) asked the following: *What relationship exists between psychologically safe school environments (as measured by a student perception survey) and literacy achievement (as measured by Maryland Comprehensive Assessment Program)? Does the strength of the relationship differ for economically impacted students compared to their non-impacted peers*?

Hypotheses H1A (PSSE associated with literacy achievement of all students), H1B (PSSE associated with literacy achievement of economically impacted students), and H1C (PSSE associated with literacy achievement of non- economically impacted students) were all accepted within the study with each association found to be statistically significant. The results of the moderated multiple regressions performed on the data from 230 middle schools in Maryland indicated there was a strong, positive correlation between the two variables, PSSE and literacy achievement. It is important to note the difference in strength of r between non-impacted and impacted students was .006 which translated to a unique contribution difference less than 1%. The results conveyed that, within the study, there was little variance in literacy achievement between economically impacted and non-impacted schools that was related to psychologically safe school environments.

In Moderated Analysis I, the part correlation coefficient for PSSE of .592 provided information that psychologically safe school environments had a 35% unique contribution to the

explanation of variance in overall literacy achievement within the study schools sampled. There was a strong, positive correlation between the two variables ($r = .592$, $n = 230$, $p<.0005$) with high levels of PSSE associated with high levels of overall literacy achievement (OLA).

In Moderated Analysis II, the part correlation coefficient for PSSE of .549 provided information that psychologically safe school environments had a 30.1% unique contribution to the explanation of variance in economically impacted literacy achievement within the schools sampled. There was a strong, positive correlation between the two variables ($r = .549$, $n = 230$, $p<.0005$) with high levels of PSSE associated with high levels of economically impacted literacy achievement (EILA).

In Moderated Analysis III, the part correlation coefficient for PSSE of .555 provided information that psychologically safe school environments had a 30.8% unique contribution to the explanation of variance in non-economically impacted literacy achievement within the study schools. There was a strong, positive correlation between the two variables ($r = .555$, $n = 230$, $p<.0005$) with high levels of PSSE associated with high levels of non-economically impacted literacy achievement (NILA).

All three hypotheses associated with research question two (H2A, H2B, and H2C) were accepted. All tests were statistically significant and provided results that the economic stratum moderated the relationship between psychologically safe school environments and literacy achievement. The results of the hypotheses supported claims found in the literature that for students who are experiencing economic disadvantages, the economic area of the school plays a role in underachievement (Rothstein, 2013).

In Moderated Analysis I, economic stratum moderated the relationship between PSSE and overall literacy achievement due to the strength of the moderator increasing the correlation

coefficient by .128. In Moderated Analysis II, economic stratum moderated the relationship between PSSE and the literacy achievement scores of economically impacted students due to the moderator increasing the correlation coefficient by .011. The strength of the moderation was not as large as the impacts on overall students and non-economically impacted students. In Moderated Analysis III, economic stratum moderated the relationship between PSSE on the literacy achievement scores of economically impacted students due to the moderator increasing the correlation coefficient by .11.

Discussion

In 2017, Maryland legislature created laws supporting the state's mandate to implement the federal Every Student Succeeds Act (ESSA) which included a method to consider survey-based measures of school climate (Kautz et.al., 2020). In efforts to meet this requirement, the Maryland State Department of Education (MSDE) developed the Maryland School Survey (MSDE, 2019a), a school climate survey for school staff and students. The Maryland School Survey was created to make transparent a variety of factors that may impact school performance, help educators to diagnose problems, and design solutions to address factors that can be difficult to measure (Kautz et.al., 2020). Middle school students in Grades 6–8 take the survey which measured four domains: safety, environment, engagement, and relationships.

This study provided adequate data correlated to achievement that supported the MSDE's proposal for implementing a state-wide survey on student perceptions. The Maryland School Survey has only recently been introduced and survey data need to be used more extensively to inform practice and impact school improvement. In this regard, the present study provides a model for future research using the school survey data. This study also demonstrated that levels of psychological safety can be moderated by the economics of a school's attendance area. The

following sections discuss psychological safety as it relates to study findings followed by implications of study findings for practice and future research.

School Psychological Safety

The discussion in this section focused on term "school psychological safety," the process of turning student survey data into actionable information for school improvement, and information on the variability in school psychological safety based on the moderation effect of economic area.

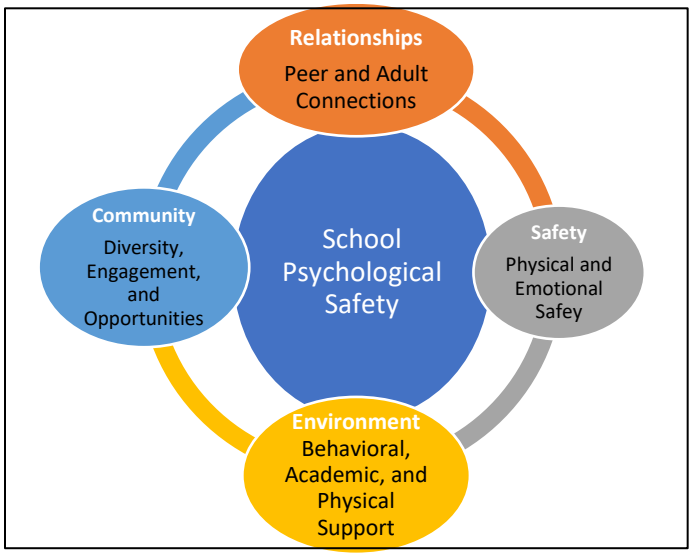
Kramer (1999) described psychological safety as an individuals' perceptions about consequences of interpersonal risks in their environment. The term "school psychological safety" extends the work presented by Edmondson (1999) to include similar characteristics of psychological safety with a focus on schools. The term *school psychological safety* is presented in this chapter as the intentional climate created by school employees that results in students perceiving the environment as psychologically safe. This research was anchored in Maslow's (1943) hierarchy of needs, specifically regarding the feeling of safety. At the core of intentional actions to create school psychological safety should be the core belief associated with the conviction that organization can define the environment for the people they serve.

It is important to note, no member of the school team is solely responsible for developing, understanding, and implementing this environment. Several roles are important in establishing a core belief within schools that will strengthen student perception of school psychological safety. Key roles in school such as principal, teacher, counselor, and psychologist must believe in creating a risk-free environment. This concept supports the research within business organizations that when all members take responsibility for doing good work without focusing on blame the environment is free to take more risks (Edmonson, 1999).

In this study, the independent variable, psychologically safe school environments (PSSE), was operationalized using the Maryland School Survey (MSDE, 2019a). Each topic of the survey is defined and provides insight into the types of questions a school can expect on the student survey with topics categorized by four domains: safety, community, environment, and relationships. The safety domain describes student perceptions of physical and emotional safety and the degree to which bullying and substance abuse occurs in the school (MSDE, 2020). The community domain describes the degree to which respect for diversity and opportunities for engagement in school activities exist (MSDE, 2020). The environment domain describes the degree to which behavioral, academic, and physical environment support a positive learning atmosphere (MSDE, 2020). The relationships domain describes the degree to which students feel they have positive, caring, and respectful connections with their peers and adults (MSDE, 2020). Figure 22 is a graphic of psychological safety with characteristics of each domain.

Figure 22

School Psychological Safety Schema



The domains of school safety suggest the various roles school personnel can serve in promoting safety within school buildings. Psychologists play key roles in providing supportive mental health services and proactive supports to students. The National Association of School Psychologists (NASP) (2017) suggested a ration of no more than 1,000 students per school psychologist, and no more than 500 to 700 students per school psychologist when more comprehensive and preventive services are needed. According to NASP (2017), only seven states meet this recommendation, and many states exceed 1,500 students to 1 psychologist. Research within the NASP organization found there will be shortages in school psychologists that will persist through 2025.

It was found that counselors in psychologically safe environments exhibited creativity in providing guidance and counseling services. Their creativity served to assist students to achieve success in their personal-social, academic, and vocational development (Purwaningrum et.al, 2019). These areas, especially the personal-social, contribute to a psychologically healthy school environment which, as the results of this study, can contribute to academic success.

Teachers can influence the dynamics of their classrooms by building strong teacher-student relationships that enhance student learning. This study supported a study of interviews of more than 74 teachers conducted by Kulikova and Maliy (2017) which found that psychological safety was one of the most important factors for developing and impacting the well-being of students. Fredriksen and Rhodes (2004) suggested students with adequate socialization concepts were able to interact with teachers and peers in a positive way which emphasizes the important role that teachers have in promoting positive socialization among their students.

Much of the literature on school leadership has focused on expectations of academic standards, teacher evaluation, and navigation of outside interferences (Griffith, 1999). Danley

and Burch (1979) described effective principals as master teachers who improve instruction. Principal leadership was categorized by Griffith (1999) with four different descriptions: instructional, custodial manager, missionary, and gamesman/politician. The missionary leader described a principal who is concerned about meeting the social needs of students, teachers, and parents through promoting a positive school climate (Griffith, 1999). This description supports the leadership qualities necessary to create, develop, and implement psychological safety within a school.

Student Perception Surveys

Based on the significant results from this study, student voices need to be elevated and actively used as data to drive school improvement. The study findings derived from a student survey aligns with the claim in research that student climate surveys completed in schools provide insights on the environment which can influence academic development (Voight & Hanson, 2017; Cohen et, al., 2009). Results from student surveys can be an effective tool in improving the climate of a school and, ultimately, promote academic achievement. The effectiveness of using student survey data for school improvement needs to be viewed as an important topic for discussion at the local, state, and federal levels.

Results of well-designed student surveys can elevate school improvement. However, survey responses need to be disaggregated by perception topic so personnel can develop comprehensive improvement plans that target multiple domains. Datasets also need to include demographic tables readily accessible for use by state, district, and school personnel. Highlighting school stories that emerge from the data can assist educators in diagnosing problems and designing solutions to address factors that can be difficult to measure (Kautz et.al., 2020). Analysis of school climate data can provide practitioners with the ability to compare

similar schools and dig deeper into understanding a school story which can lead to creating psychological safety.

Economic Areas of Schools

This research supported the claim in the literature that economic areas play a role in underachievement. According to Maslow's theory, students in low economic strata need to satisfy physiological needs before their psychological needs (Earthman, 2002; Maslow, 1943). In areas in this study where the economics fell into the lowest (the first) economic stratum, an exacerbated concentration of low achievement existed, a phenomenon supported by other research on student achievement (Simons et al., 2004; Wilson, 1997).

The results of this study supported claims found in literature that when students experience personal economic disadvantages, the economic area of the school can moderate their achievement (Rothstein, 2013). The results of this study supported Cohen's (2006) suggestion that unsupportive environments adversely affect academic achievement, mental health, and physical health. The results of this study suggest that high school psychological safety is correlated with higher levels of achievement than less psychologically safe schools.

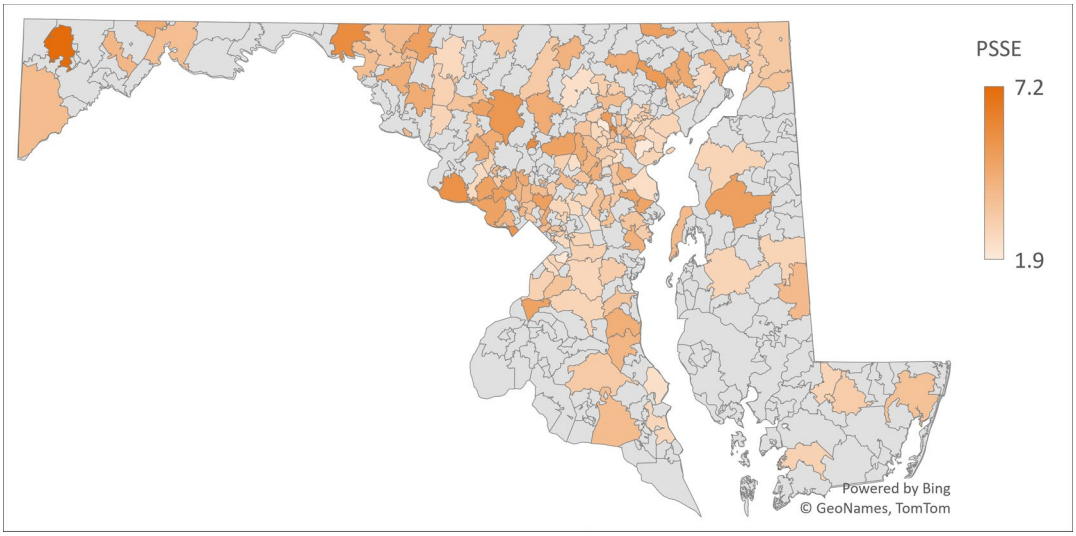
In investigating economic areas, a table of zip codes and a heat map were used as new geographic ways to view comparable PSSE scores and economic areas. Figure 23 displays the heat map of Maryland with the distribution of PSSE scores by zip code. Scores ranged from 1.9 (low PSSE) to 7.2 (high PSSE). Appendix G provides a table with a complete list of PSSE by zip code for all 230 schools in the study.

To analyze data in heat maps or tables of PSSE, the student survey scores were calculated by taking student scores between 1 and 10 on each topic and creating an average for the entire survey (MSDE, 2020). Because all scores are benchmarked, overall scores or topic scores from

the Maryland student survey can be compared to one another. This provides school leaders the ability to compare topic scores in order to prioritize school improvement goals (MSDE, 2020).

Figure 23

Heat Map of PSSE for Maryland



Locations of outliers and other unexpected examples emerged as the analyses of the survey data proceeded. For example, one of the schools with the highest levels of PSSE recorded in the study was Northern Middle School in Garrett County, Maryland. At the time of the study, the school's percentage of enrollment for economically impacted students was 43.6%, a high rate and the school's PSSE score was 7.2, also a high rate. A brief scan of the school's website revealed that the stated vision of the school included references to social well-being. Northern Middle School's mission was to successfully meet the academic and social challenges of the transitional student. The site also communicated that the mission was about striving to be supportive while setting high standards and to be child-centered while encouraging growth. Additionally, the homepage of the website displayed a variety of links for psychological services (Garret County Public Schools, n.d.). Because this school is located in a rural area, the school's

ability to create psychological safety should be compared to rural schools with similar demographics.

Based on the story of Northern Middle School with its higher levels of achievement compared to schools in Maryland with similar percentages of economically disadvantaged students, two questions arise. First: Why did economically disadvantaged students in Garrett County perceive their school as safer than students in urban areas? And second, why are more economically disadvantaged students not moved to adjacent schools with higher levels of psychological safety?

Improving urban settings can be difficult and requires leadership to consider all domains of psychological safety within the school as well as in the community (Green, 2015). The results of this study revealed that schools with low PSSE were associated with low achievement. Additionally, the majority of the schools identified with low PSSE were located in urban areas with high concentrated rates of extreme poverty (Orfield & Lee, 2005). In areas where the economics fell into the lowest economic stratum, exacerbated concentration of low achievement also existed, a finding supported by the literature (Simons et al., 2004; Wilson, 1997).

Because this research was grounded in Maslow's (1943) hierarchy of needs, the belief is that the effects of economic area on underachievement is related to students seeking to satisfy physiological needs before their psychological needs (Earthman, 2002; Maslow, 1943). Based on the theoretical framework of this study, students in environments with low achievement and associated low psychological safety are potentially seeking physiological needs instead of accessing learning. There is extensive research on school reform within urban areas much of which has been associated with local community conditions (Green, 2015). Given the need to

meet accountability standards, much attention has been placed on the quality of instruction rather than on student well-being.

The quantitative results of the study supported the research of Deluca and Rosenblatt (2010) which suggested that affluent communities have higher-performing schools because of educationally engaged peers and parent access to networks focused on school quality. Within the present study, economic stratum moderated the relationship between psychological safe school environments and overall literacy achievement due to the strength of the moderator in increasing the correlation between the two variables. Deluca and Rosenblatt (2010) also found that neighborhood change could improve opportunities for students which ultimately could improve their educational outcomes.

When considering ways to provide opportunities for economically impacted students to attend more psychologically safe schools, the challenge remains how can urban areas or large districts provide access. Research has identified the process of boundary analysis, and Bayer et al. (2007) found evidence of bias associated with differences in the quality of neighborhoods across school boundaries. However, many school districts have not conducted analysis of boundaries since the 1954 decision of the U.S Supreme Court in Brown v. Board of Education and might do well to investigate this area of inquiry related to reducing concentrations in schools of students from low stratum economic areas. In any case, large school districts should ask the question: With one of the lowest median economic incomes of $66,750, what strategies are being provided at Northern Middle School to have all student perceive their schools as psychologically safe?

Information about attendance zones is not available digitally and requires substantial effort to transform into a usable format (Dhar & Ross, 2012). In reviewing research on

capitalization of current school quality and boundary analysis, Black (1999) suggested that studies might be biased because information on neighborhood quality may not be readily available. Research efforts and political policies on population composition, school attendance zones, optional attendance zones, and the effects of segregated systems all need to provide updated information on the impact on school communities. Increased efforts by researchers and policy makers to provide information on economic areas and their relation to schools are needed.

In large school districts, boundary analysis is sidetracked by conversations about race and class. It is difficult to interpret if the conflict to create effective school boundaries is due to race, economic status, or other demographic forces. Given residential transition along racial lines and its relationship to district-wide school enrollment percentages, there continues to be a decline of White populations and an increase in other races in large districts (Clark, 1987). The intended purpose of any boundary changes, programs to elevate minority groups, or optional choices can have adverse effects and therefore a mechanism is needed to control for the differences in neighborhood quality across boundaries (Dhar & Ross, 2012).

Implications

Professional Development

In this study, student perceptions of psychologically safe school environments were found to have a significant relationship with student achievement. These findings suggest schools should elevate the design and development of psychological safety within every school to mitigate the physical and emotional needs of students to free them to focus on academics. As indicated earlier, the Maryland School Survey included four domains of the psychological safety of a school: safety, community, environment, and relationships. Descriptors of each domain were also provided. These descriptors can serve as objectives for school improvement and can be used

as a framework for professional development. Table 42 displays the descriptors taken from the Maryland Student Survey Manual (MSDE Student Survey Manual DE, 2019a) which can be used as components of a professional development program to enhance a school's psychological safety for students.

Use of Student Perception Surveys

A recommendation stemming from this research includes expanding the use of carefully designed student perception surveys focused on psychologically safe school environments and other aspects of students' wellbeing. While many states may not have implemented state-wide surveys on students' perceptions of their environment, this study reveals the importance and usefulness of such surveys. State- or area-wide surveys allow for deeper understanding of the status of individual schools within a larger context. In schools where students are routinely surveyed on a variety of issues, it is important that surveys are targeted, and the resulting data are useful. Most importantly, survey results should not be overlooked; the data needs to be used for designing and implementing school improvement plans.

A second recommendation regarding the student surveys is that they be designed to facilitate disaggregation by topic. Reviewing a school's disaggregated scores by topics allows school systems to view specific areas of psychological safety which facilitates use of the data to fashion improvement objectives. Figure 24 shows an example of the data collected in this study disaggregated by topic scores. One recommendation is that schools select the perception topic with the lowest rating and provide school improvement objectives with actions in order to improve safety in that area. Note that overall survey results are listed in the figure and can be compared to schools with similar demographics.

Table 42

Professional Development Domains for School Psychological Safety (

Domain	School Descriptor	Student Perception Descriptor
Safety	Student perceptions of physical and emotional safety and the degree to which bullying and substance abuse occur in the school.	The **physical safety** topic describes the degree to which students feel safe at school, and whether students at the school fight, threaten other students, and/or damage others' property. The **emotional safety** topic describes the degree to which students feel happy, socially accepted, listened to, and a part of their school. The **bullying** topic describes the degree to which students' feel students are teased, picked on, or bullied/cyberbullied, whether in general or specifically about their race, ethnicity, cultural background, religion, or ability. The **substance abuse** topic describes the degree to which students believe students think that it is okay to use alcohol, drugs, and/or tobacco while at school and can do so without getting caught.
Community	The degree to which there is respect for diversity and that there are opportunities for participation and engagement in the school.	The **respect for diversity** topic describes the degree to which students feel students are treated fairly and respectfully, and whether they feel represented and included, regardless of race, ethnicity, gender, cultural background, or family income. The **participation and engagement** topic describe the degree to which students feel there are chances to participate in class discussions and activities, school-sponsored events, extracurricular activities, and school rule making.
Environment	The degree to which there are behavioral and academic supports, and the physical environment supports a positive learning and working environment.	The **behavioral and academic supports** topic describes the degree to which students feel they receive social, emotional, behavioral, and academic supports from adults at the school. Behavior is addressed appropriately, and what students are learning is important to them and connected to life outside the classroom. The **physical environment** topic describes the degree to which students feel the school is kept clean, comfortable, and in good repair.
Relationships	The degree to which students and educators feel that students have positive, caring, and respectful connections with their peers and adults in the school.	The **student-student relationships** topic describes the degree to which students feel other students are friendly with, care about, get along with, and respect one another. The **student-staff relationships** topic describes the degree to which students feel adults at the school like, care about, listen to, and respect students.
Classroom	Teachers can influence the dynamics of their classrooms by building strong teacher-student relationships that enhance student learning.	Implement strategies that **mitigate students fear** of asking for critical feedback. Provide strategic processes that allow students to **ask questions without prompting**. Plan lessons and impromptu moments for students to **brainstorm openly in groups**. Support and elevate strategies that promote an environment for students to be comfortable **making academic mistakes.**

Note. Abbreviated from the MSDE Student Survey Manual, 2020

Figure 24

Sample of Disaggregated Student Survey Results (MSDE, 2020)

2019 MD Report Card Survey Data By Topic, All Students & Educators

		All Students		
		2019	2020	2021
Survey Count		677		
Overall Survey Results		5.910		
Community	Participation and Engagement	6.735		
	Respect for Diversity	6.330		
Environment	Behavioral and Academic Supports	5.864		
	Physical Environment	6.494		
Relationships	Staff-student Relationships	6.757		
	Student-student Relationships	4.181		
Safety	Bullying	5.212		
	Emotional Safety	5.689		
	Physical Safety	4.671		
	Substance Abuse	7.172		
Instructional Support	Instructional Feedback	NA		

Note. Taken from MSDE, 2020.

Key Roles Within Schools

If schools want to increase practices around school psychological safety, emphasis should be placed on ensuring school leaders are able to provide proactive actionable objectives and support in all domains of school psychological safety: community, environment, relationships, and safety. Local school districts should reexamine the role of psychologists in assisting in the design of school psychological safety. More importantly, local school districts should redesign how they allocate psychologist positions to ensure the ratio of psychologist to students allows for increased interaction while actively supporting the community with resources. This approach moves the position beyond evaluations and attendance at student assessment meetings and conceives of it as one that provides proactive strategies and accessible pathways that support students' mental health.

Teachers should be provided ongoing professional development on classroom practices that provide support for mental health and trauma. The article, "Professional and Personal Qualities of the Teacher in the Context of the Psychological Safety of Educational Environment," by Kulikova and Maliy (2017) includes recommendations around building teacher capacity for psychological safety in the classroom. It is essential that the education field provide access to shared best practices in mental health, trauma, anxiety, depression, bullying, and cognitive support. The research in this area found that as students perceived their environment as safe, their ability to express themselves without fear was directly correlated to their achievement (Kramer, 1999). As indicated in Table 42 and recommended by Edmonson (1999), teachers should be supported in: (a) implementing strategies that mitigate students' fear of asking for critical feedback; (b) providing strategic processes that allow students to ask questions without prompting; (c) planning lessons and impromptu moments for students to brainstorm openly in groups; and (d) supporting, promoting, and elevating strategies that promote an environment for students to be comfortable making academic mistakes.

Counselors can promote effective practices that decrease proximity to students by frequently approaching and talking during lunch or break times. Fredriksen and Rhodes (2004) supported this study's argument by stating students' negative perceptions of overall school environment result in students being reluctant to use the school environment for support. Counseling proactive strategies can mitigate reluctant students. Guidance and counseling rooms allow visitation for support without judgment.

Griffith (1999) provided research which reviewed literature on effective principals associated with school climate relations. School configuration has played a substantial role in the priorities of school leadership with school configuration within large districts responding to

parents, community groups, and political groups, rather than students' voices (Chubb & Moe, 1990). It is the recommendation of this study for local school districts to actively lead administrators through professional development on transformation or missionary leader leadership, where principals are concerned about meeting social needs of students, teachers, and parents through positive school climate (Griffith, 1999).

Future Research

Although it is not within the parameters of the data from this study, Hart and Risley (2006) suggested economically impacted students come from homes where twice as many reprimands as positive comments are provided by guardians or parents. Future research could interview teachers and staff from schools with evidence of high levels of school psychological safety to determine what antecedent behaviors were associated with promoting high levels of psychological safety.

Future research could take a closer look at underperforming schools to see if there is an association with how student perceive their school safety and, in particular, their school authority figures. This could be particularly helpful in urban districts. Future research could look more specifically at antecedents that moderate the strength of student perceptions. Within each school, the results of the study revealed little variance between economically impacted and non-impacted students once the moderator, the product of psychologically safe school environment score, and the median economics of attendance area impacted psychological safety and overall achievement. This minimal difference in subgroups supported the claim by Johnson (2013) that educators should be able to embrace the concept that the same outcomes for wealthy students can be applied to students in poverty.

Future research should focus on providing antecedent data on risk-taking and conduct walkthrough observations of schools with high levels of psychological safety. Research could be conducted using the data file from this study and performing a regression to determine the impact of economically disadvantaged enrollment and the impact on achievement.

Furthermore, researchers could determine thresholds of economically disadvantaged enrollment at which point achievement levels decrease the most. Understanding this data point could lead to a more meaningful conversation around boundary analysis and economic impact. A final recommendation for researchers is to explore schools with high psychological safety to discover additional information on specific programs, partnerships, or other resources that support a school's psychological safety.

Conclusions

This study examined the relationships between an independent variable, psychologically safe school environment, and dependent variables, overall literacy achievement, economically impacted achievement, and non-economically impacted achievement. Archival data from 230 schools were used in three moderated multiple regression analyses to address the research questions and hypotheses.

This study presented quantifiable data displayed throughout chapters using tables, charts, graphs, and diagrams that contained data sets specifically around the characteristics of the sample, the unit of analysis, statistics on individual variables, and three moderated multiple regression (MMR) statistical models that addressed the research questions. The association between the variables in each analysis was found to be statistically significant and to have a strong positive relationship. A moderated multiple regression model revealed that PSSE had a 35% unique contribution to the explanation of variance in overall literacy achievement. It was

also discovered that PSSE displayed a 30.1% unique contribution on the achievement of economically impacted students and 30.8% on non-impacted students. In the moderated multiple regression model, it was discovered that the moderator had a strong effect on the association between PSSE and overall literacy achievement by .128 and .11 for non-impacted students. The moderator had the lease effect on economically impacted students at .011.

Early research by Maslow (1943) showed that there are important levels of support needed for all people to feel safe. This study examined differences in student achievement based on the differences in perceived school psychological safety. The study engaged discussion on the overarching placebo effect that psychological safety can have on students. This research adds to the literature on education and also provides comments and pathways to schools with characteristics that play a significant role in shaping school climate for students (MacNeil et al., 2009). This study added to research the term *school psychological safety* that synthesized the dynamics of psychological safety for business teams and applied them to classrooms.

This study was designed to uncover factors such as school safety that mediate academic performance of middle school students. The middle school educational years are critical; students experience rapid change physically, cognitively, and socially. Students also develop a sense of social relationships, incorporate concepts around self-identity, and operationalize their own ethical code of morality (Eccles & Midgley, 1989; Jackson & Davis, 2000). A measure of student perceptions was used with the conviction that voices of middle school students need to be heard. Furthermore, statistical tests on hypotheses using available data sets were conducted with the hope of motivating educational researchers to mine available school data and seek out schools with high psychological safety to uncover practices for improving the school environment for students.

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APPENDIX A

2017 ENROLLMENT BY RACE/ETHNICITY IN MARYLAND SCHOOLS

Enrollment in Maryland Public Schools by Race/Ethnicity: September 30, 2017

Local Unit	Total Students	American Indian/ Alaska Native		Asian		Black/ African American		White		Hispanic		Native Hawaiian/ Other Pacific Islander		Two or More Races	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Total State	**893,689**	**2,387**	**0.3**	**58,823**	**6.6**	**301,542**	**33.7**	**333,552**	**37.3**	**155,346**	**17.4**	**1,300**	**0.1**	**40,739**	**4.6**
Allegany	8,629	14	0.2	82	1.0	284	3.3	7,591	88.0	122	1.4	3	0.0	533	6.2
Anne Arundel	82,777	232	0.3	3,088	3.7	17,296	20.9	44,631	53.9	12,276	14.8	186	0.2	5,068	6.1
Baltimore City	80,591	186	0.2	776	1.0	63,976	79.4	6,420	8.0	8,362	10.4	163	0.2	708	0.9
Baltimore	113,282	487	0.4	8,119	7.2	44,297	39.1	43,826	38.7	10,979	9.7	150	0.1	5,424	4.8
Calvert	15,908	33	0.2	260	1.6	2,044	12.8	11,323	71.2	933	5.9	11	0.1	1,304	8.2
Caroline	5,787	12	0.2	69	1.2	839	14.5	3,629	62.7	795	13.7	2	0.0	441	7.6
Carroll	25,290	47	0.2	698	2.8	983	3.9	21,112	83.5	1,619	6.4	52	0.2	779	3.1
Cecil	15,364	37	0.2	109	0.7	1,417	9.2	11,793	76.8	1,050	6.8	18	0.1	940	6.1
Charles	26,891	106	0.4	839	3.1	14,884	55.3	6,784	25.2	2,233	8.3	40	0.1	2,005	7.5
Dorchester	4,767	4	0.1	78	1.6	1,898	39.8	2,058	43.2	393	8.2	3	0.1	333	7.0
Frederick	42,140	138	0.3	2,268	5.4	5,112	12.1	25,460	60.4	6,958	16.5	79	0.2	2,125	5.0
Garrett	3,811	0	0.0	11	0.3	10	0.3	3,674	96.4	50	1.3	1	0.0	65	1.7
Harford	37,780	107	0.3	1,265	3.3	7,203	19.1	24,076	63.7	2,704	7.2	79	0.2	2,346	6.2
Howard	56,784	127	0.2	12,425	21.9	13,411	23.6	21,161	37.3	6,086	10.7	75	0.1	3,499	6.2
Kent	1,993	4	0.2	10	0.5	457	22.9	1,213	60.9	169	8.5	0	0.0	140	7.0
Montgomery	161,546	275	0.2	23,253	14.4	34,615	21.4	45,769	28.3	49,704	30.8	88	0.1	7,842	4.9
Prince George's	132,322	372	0.3	3,719	2.8	76,881	58.1	5,494	4.2	43,860	33.1	284	0.2	1,712	1.3
Queen Anne's	7,778	10	0.1	103	1.3	454	5.8	6,192	79.6	605	7.8	4	0.1	410	5.3
SEED School	400	0	0.0	0	0.0	379	94.8	4	1.0	15	3.8	0	0.0	2	0.5
St. Mary's	18,053	56	0.3	456	2.5	3,314	18.4	11,580	64.1	1,280	7.1	28	0.2	1,339	7.4
Somerset	2,918	7	0.2	28	1.0	1,313	45.0	1,138	39.0	277	9.5	4	0.1	151	5.2
Talbot	4,646	4	0.1	90	1.9	753	16.2	2,713	58.4	830	17.9	2	0.0	254	5.5
Washington	22,595	27	0.1	483	2.1	2,979	13.2	15,180	67.2	2,083	9.2	15	0.1	1,828	8.1
Wicomico	14,953	85	0.6	464	3.1	5,478	36.6	6,363	42.6	1,476	9.9	12	0.1	1,075	7.2
Worcester	6,684	17	0.3	130	1.9	1,265	18.9	4,368	65.4	487	7.3	1	0.0	416	6.2

MSDE-DCRAA 12/17

Maryland Public School Enrollment

APPENDIX B

ENROLLMENT IN MARYLAND SCHOOLS (PARTICIPANTS AND NON-PARTICIPANTS)

Number of Maryland Public Schools: September 30, 2017

Local Unit	Total	Elementary	Middle	High	Combined	Vocational Technical	Special Education Centers	Alternative Centers	Charter	Programs
Total State	**1,428**	**781**	**212**	**180**	93	**22**	37	**42**	50	**11**
Allegany	26	14	4	3	0	1	0	0	0	4
Anne Arundel	123	80	19	12	0	2	4	3	3	0
Baltimore City	173	41	3	15	67	4	6	3	33	1
Baltimore	173	107	26	21	1	3	4	9	0	2
Calvert	25	12	6	4	0	1	1	1	0	0
Caroline	10	5	2	2	0	1	0	0	0	0
Carroll	44	22	8	7	0	1	1	5	0	0
Cecil	29	17	6	5	0	1	0	0	0	0
Charles	38	21	8	7	0	0	0	2	0	0
Dorchester	13	6	2	2	1	1	0	1	0	0
Frederick	67	36	12	10	1	1	1	3	3	0
Garrett	12	7	2	2	1	0	0	0	0	0
Harford	54	33	9	9	0	1	1	1	0	0
Howard	76	41	20	12	0	0	1	2	0	0
Kent	5	3	1	1	0	0	0	0	0	0
Montgomery	207	133	40	25	0	1	7	1	0	0
Prince George's	209	121	24	24	12	0	8	9	10	1
Queen Anne's	14	8	3	2	1	0	0	0	0	0
SEED School	1	0	0	0	1	0	0	0	0	0
St. Mary's	29	18	4	3	0	1	0	0	1	2
Somerset	9	5	1	0	2	1	0	0	0	0
Talbot	8	5	1	1	1	0	0	0	0	0
Washington	45	25	7	7	1	1	2	1	0	1
Wicomico	24	15	3	3	2	0	0	1	0	0
Worcester	14	6	1	3	2	1	1	0	0	0

APPENDIX C

IRB APPROVAL LETTER

October 26, 2020

Mr. Joel Beidleman
401 Rosemont Ave.
Frederick, MD 21701

Dear Mr. Beidleman,

The Hood College Institutional Review Board reviewed your proposal for the study entitled *"Psychological Safe School Environments: Examining the relationship between Psychological Safe School Environments (PSSE) and the proficient literacy achievement of economically impacted middle school students"* (Proposal Number 2021-1). The committee determined that this study merits EXEMPT status as you are using archival data with all identifying information removed. We approve this study for a period of 12 months. This approval is limited to the activities described in the procedure narrative and extends to the performance of these activities identified in the IRB research proposal.

All individuals engaged in human subjects research are responsible for compliance with all applicable Hood Research Policies:
https://www.hood.edu/sites/default/files/Hood%20IRB%20Policy%20revised%20September%202013.pdf.

The Lead Researcher of the study is ultimately responsible for assuring all study team members review and adhere to applicable policies for the conduct of human sciences research.

The Hood College IRB approval expiration date is October 26th, 2021. As a courtesy, approximately 30-60 days prior to expiration of this approval, it is your responsibility to apply for continuing review and receive continuing approval for the duration of the study as applicable. Lapses in approval should be avoided to protect the safety and welfare of enrolled participants.

No substantive changes are to be made to the approved protocol or the approved consent and assent forms without the prior review and approval of the Hood IRB. All substantive changes (e.g. change in procedure, number of subjects, personnel, study locations, study instruments, etc.) must be prospectively reviewed and approved by the IRB before they are implemented.

Sincerely,

Diane R. Graves, PhD
Chair, Hood College Institutional Review Board

APPENDIX D

CRITERIA FOR DETERMINING RELIABILITY AND VALIDITY OF MARYLAND STUDENT SURVEY

Table 4. Criteria for determining reliability and validity and performance of the final survey administered in spring 2019

Domain and definition[a]	Statistic	Criterion for acceptable fit	Performance of the final survey
Item response rate	The percentage of respondents who skip each item	Each item must be skipped by fewer than 10 percent of respondents (National Center for Education Statistics, 2015)[b]	All items met this criterion.
Item response variance	The percentage of responses in each response category	Fewer than 90 percent of responses fall within a particular response category (National Center for Education Statistics, 2015)[b]	All items met this criterion.
Reliability	Cronbach's alpha (Cronbach, 1951)	≥ 0.65 to 0.70 (Bland & Altman, 2007; Taber, 2018)	All topics met the lower-bound criterion for acceptable fit (0.65). All but one met the upper-bound criterion (0.70).
Overall CFA model fit	Root mean square error of approximation (Steiger & Lind, 1980)	≤ 0.05 for a close fit ≤ 0.08 for a reasonable fit (Browne & Cudeck, 1992)	All three survey forms met the criterion for a reasonable fit.
Overall CFA model fit	Comparative fit index (Bentler, 1990)	≥ 0.90 (Brown, 2015)	Two of three survey forms met this threshold. One was acceptably close (0.88).
Overall CFA model fit	Tucker-Lewis index (Tucker & Lewis, 1973)	≥ 0.90 (Brown, 2015)	Two of three survey forms met this threshold. One was acceptably close (0.89).
Relationship between items and associated topics	Standardized factor loading for each item	≥ 0.40 for each item (Stevens, 2012)	All items met this criterion.

CFA is confirmatory factor analysis.
[a]See Appendix A.III for descriptions of each of these criteria.
[b]These criterion are based on reporting standards used by the the ED School Climate Surveys (National Center for Education Statistics, 2015).
Source: Authors' analyses based on Maryland State Department of Education 2018-19 data.

APPENDIX E

EXCLUDED SCHOOLS FROM SAMPLE

Note of Exclusion	School	District
Charter	Chesapeake Science Point	Anne Arundel County Public Schools
Insufficient Data	Mary Moss at Adams Academy	Anne Arundel County Public Schools
Charter	Mary Moss at Adams Academy	Anne Arundel County Public Schools
Insufficient Data	Mary Moss at Adams Academy	Anne Arundel County Public Schools
Charter	Monarch Academy	Anne Arundel County Public Schools
Charter	Afya Public Charter School	Baltimore City Public Schools
Charter	Baltimore Collegiate School for Boys	Baltimore City Public Schools
Charter	Baltimore International Academy	Baltimore City Public Schools
Charter	Baltimore International Academy	Baltimore City Public Schools
Charter	Baltimore Leadership School for Young Women	Baltimore City Public Schools
Charter	Baltimore Montessori Public Charter School	Baltimore City Public Schools
Charter	Banneker Blake Academy of Arts and Sciences (Exclude)	Baltimore City Public Schools
Insufficient Data	Booker T. Washington Middle	Baltimore City Public Schools
Charter	City Neighbors Charter School	Baltimore City Public Schools
Charter	City Neighbors Hamilton	Baltimore City Public Schools
Charter	City Springs Elementary/Middle	Baltimore City Public Schools
Insufficient Data	Colington Square Elementary/Middle	Baltimore City Public Schools
Charter	ConneXions: A Community Based Arts School	Baltimore City Public Schools
Charter	Empowerment Academy	Baltimore City Public Schools
Charter	Green Street Academy	Baltimore City Public Schools
Exclude for Non-Impact Enrollment less than 5%	Guilford Elementary/Middle	Baltimore City Public Schools
Charter	Hampstead Hill Academy	Baltimore City Public Schools
Charter	Hampstead Hill Academy	Baltimore City Public Schools

Note of Exclusion	School	District
Insufficient Data	Highlandtown Elementary/Middle #215	Baltimore City Public Schools
Charter	KIPP Harmony Academy	Baltimore City Public Schools
Insufficient Data	Lois T. Murray Elementary/Middle	Baltimore City Public Schools
Insufficient Data	Lois T. Murray Elementary/Middle	Baltimore City Public Schools
Charter	Midtown Academy	Baltimore City Public Schools
Charter	New Song Academy	Baltimore City Public Schools
Charter	Patterson Park Public Charter School	Baltimore City Public Schools
Exclude for Non-Impact Enrollment less than 5%	Pimlico Elementary/Middle	Baltimore City Public Schools
Charter	Rosemont Elementary/Middle	Baltimore City Public Schools
Charter	Southwest Baltimore Charter School	Baltimore City Public Schools
Charter	The Crossroads School	Baltimore City Public Schools
Charter	The Stadium School	Baltimore City Public Schools
Charter	Turnbridge Public Charter School	Baltimore City Public Schools
Magnet	Deer Park Middle Magnet School	Baltimore County Public Schools
Magnet	Loch Raven Technical Academy	Baltimore County Public Schools
Magnet	Northwest Academy of Health Sciences	Baltimore County Public Schools
Magnet	Parkville Middle & Center of Technology	Baltimore County Public Schools
Charter	Southwest Academy	Baltimore County Public Schools
Magnet	Southwest Academy	Baltimore County Public Schools
Magnet	Stemmers Run Middle	Baltimore County Public Schools
Magnet	Sudbrook Magnet Middle	Baltimore County Public Schools
Insufficient Data	Crossroads Middle School	Carroll County Public Schools
Insufficient Data	Benjamin Stoddert Middle School	Charles County Public Schools
Insufficient Data	General Smallwood Middle School	Charles County Public Schools
Insufficient Data	John Hanson Middle School	Charles County Public Schools
Insufficient Data	Mattawoman Middle School	Charles County Public Schools
Insufficient Data	Matthew Henson Middle School	Charles County Public Schools

Note of Exclusion	School	District
Insufficient Data	Milton M. Somers Middle School	Charles County Public Schools
Insufficient Data	Piccowaxen Middle School	Charles County Public Schools
Insufficient Data	Theodore G. Davis Middle School	Charles County Public Schools
Insufficient Data	Mace's Lane Middle School	Dorchester County Public Schools
Insufficient Data	North Dorchester Middle School	Dorchester County Public Schools
Charter	Frederick Classical Charter School	Frederick County Public Schools
Charter	Monocacy Valley Montessori School	Frederick County Public Schools
Insufficient Data	Walkersville Middle	Frederick County Public Schools
Exclude for Econ Impact Enrollment less than 5%	Clarksville Middle	Howard County Public Schools
Insufficient Data	Dunloggin Middle	Howard County Public Schools
Exclude for Econ Impact Enrollment less than 5%	Folly Quarter Middle	Howard County Public Schools
Exclude for Economic Impact Enrollment less than 5%	Lime Kiln Middle	Howard County Public Schools
Exclude for Economic Impact Enrollment less than 5%	Mount View Middle	Howard County Public Schools
Magnet	Eastern Middle School	Montgomery County Public Schools
Exclude for Econ Impact Enrollment less than 5%	Herbert Hoover Middle	Montgomery County Public Schools
Magnet	Roberto W. Clemente Middle	Montgomery County Public Schools
Magnet	Takoma Park Middle School	Montgomery County Public Schools
Exclude for Econ Impact Enrollment less than 5%	Thomas W. Pyle Middle	Montgomery County Public Schools
Magnet	Benjamin D. Foulois Academy	Prince George's County Public Schools
Charter	Chesapeake Math and IT Public Charter	Prince George's County Public Schools
Charter	Chesapeake Math and IT South Public Charter	Prince George's County Public Schools

Note of Exclusion	School	District
Charter	College Park Academy	Prince George's County Public Schools
Magnet	Dora Kennedy French Immersion	Prince George's County Public Schools
Charter	Excel Academy Public Charter	Prince George's County Public Schools
Charter	Imagine Andrews Public Charter	Prince George's County Public Schools
Charter	Imagine Foundations at Leeland PCS	Prince George's County Public Schools
Charter	Imagine Foundations at Morningside PCS	Prince George's County Public Schools
Charter	Imagine Lincoln Public Charter	Prince George's County Public Schools
Magnet	John Hanson Montessori	Prince George's County Public Schools
Magnet	Judith P. Hoyer Montessori	Prince George's County Public Schools
Magnet	Maya Angelou French Immersion	Prince George's County Public Schools
Magnet	Robert Goddard Montessori	Prince George's County Public Schools
Magnet	Thomas G. Pullen School	Prince George's County Public Schools
Insufficient Data	Thomas Johnson Middle insufficient data by MSDE	Prince George's County Public Schools
Charter	Turning Point Academy Public Charter	Prince George's County Public Schools
Charter	Walker Mill Middle	Prince George's County Public Schools
Charter	Chesapeake Charter School	St. Mary's County Public Schools
Magnet	Western Heights Middle	Washington County Public Schools
Magnet	Springfield Middle	Washington County Public Schools

APPENDIX F

MARYLAND MIDDLE SCHOOLS INCLUDED IN STATISTICAL STUDY

School ID	School Name	District by County
504	Braddock Middle	Allegany
1301	Mount Savage Middle	Allegany
406	Washington Middle	Allegany
802	Westmar Middle	Allegany
4033	Annapolis Middle	Anne Arundel
3023	Arundel Middle	Anne Arundel
1023	Brooklyn Park Middle	Anne Arundel
4283	Central Middle	Anne Arundel
2423	Chesapeake Bay Middle	Anne Arundel
1043	Corkran Middle School	Anne Arundel
3263	Crofton Middle	Anne Arundel
2033	George Fox Middle	Anne Arundel
1053	Lindale Middle	Anne Arundel
3033	MacArthur Middle	Anne Arundel
2243	Magothy River Middle	Anne Arundel
1063	Marley Middle	Anne Arundel
3423	Meade Middle	Anne Arundel
3333	Old Mill Middle North	Anne Arundel
3343	Old Mill Middle South	Anne Arundel
2413	Severn River Middle	Anne Arundel
2043	Severna Park Middle	Anne Arundel
4053	Southern Middle	Anne Arundel
4043	Wiley H. Bates Middle	Anne Arundel
151	Catonsville Middle	Baltimore
853	Cockeysville Middle	Baltimore
1557	Deep Creek Middle	Baltimore
953	Dumbarton Middle	Baltimore
1251	Dundalk Middle	Baltimore
451	Franklin Middle	Baltimore
1255	General John Stricker Middle	Baltimore
1451	Golden Ring Middle	Baltimore
855	Hereford Middle	Baltimore
1253	Holabird Middle	Baltimore
1351	Lansdowne Middle	Baltimore
1556	Middle River Middle	Baltimore

School ID	School Name	District by County
1151	Perry Hall Middle	Baltimore
352	Pikesville Middle	Baltimore
957	Pine Grove Middle	Baltimore
852	Ridgely Middle	Baltimore
1559	Sparrows Point Middle	Baltimore
253	Woodlawn Middle	Baltimore
1356	Arbutus Middle	Baltimore
256	Windsor Mill Middle	Baltimore
234	Arlington Middle	Baltimore (City)
243	Armistead Gardens Elementary/Middle	Baltimore (City)
54	Barclay Elementary/Middle	Baltimore (City)
124	Bay-Brook Elementary/Middle	Baltimore (City)
246	Beechfield Elementary/Middle	Baltimore (City)
75	Calverton Elementary/Middle	Baltimore (City)
256	Calvin M. Rodwell Elementary/Middle	Baltimore (City)
159	Cherry Hill Elementary/Middle	Baltimore (City)
27	Commodore John Rogers Elementary/Middle	Baltimore (City)
247	Cross Country Elementary/Middle	Baltimore (City)
207	Curtis Bay Elementary/Middle	Baltimore (City)
201	Dickey Hill Elementary/Middle	Baltimore (City)
254	Dr. Martin Luther King, Jr. Elementary/Middle	Baltimore (City)
58	Dr. Nathan A. Pitts-Ashburton Elementary/Middle	Baltimore (City)
368	Elmer A. Henderson: A Johns Hopkins Partnership Sc	Baltimore (City)
241	Fallstaff Elementary/Middle	Baltimore (City)
85	Fort Worthington Elementary/Middle	Baltimore (City)
76	Francis Scott Key Elementary/Middle	Baltimore (City)
95	Franklin Square Elementary/Middle	Baltimore (City)
212	Garrett Heights Elementary/Middle	Baltimore (City)
235	Glenmount Elementary/Middle	Baltimore (City)
240	Graceland Park/O'Donnel Heights Elementary/Middle	Baltimore (City)
236	Hamilton Elementary/Middle	Baltimore (City)
55	Hampden Elementary/Middle	Baltimore (City)
35	Harlem Park Elementary/Middle	Baltimore (City)
210	Hazelwood Elementary/Middle	Baltimore (City)
237	Highlandtown Elementary/Middle #237	Baltimore (City)
229	Holabird Elementary/Middle	Baltimore (City)
10	James McHenry Elementary/Middle	Baltimore (City)

School ID	School Name	District by County
228	John Ruhrah Elementary/Middle	Baltimore (City)
12	Lakeland Elementary/Middle	Baltimore (City)
245	Leith Walk Elementary/Middle	Baltimore (City)
371	Lillie May Carroll Jackson School	Baltimore (City)
203	Maree Garnett Farring Elementary/Middle	Baltimore (City)
53	Margaret Brent Elementary/Middle	Baltimore (City)
44	Montebello Elementary/Middle	Baltimore (City)
220	Morrell Park Elementary/Middle	Baltimore (City)
66	Mount Royal Elementary/Middle	Baltimore (City)
81	North Bend Elementary/Middle	Baltimore (City)
15	Stadium School	Baltimore (City)
13	Tench Tilghman Elementary/Middle	Baltimore (City)
221	The Mount Washington School	Baltimore (City)
232	Thomas Jefferson Elementary/Middle	Baltimore (City)
84	Thomas Johnson Elementary/Middle	Baltimore (City)
226	Violetville Elementary/Middle	Baltimore (City)
134	Walter P. Carter Elementary/Middle	Baltimore (City)
51	Waverly Elementary/Middle	Baltimore (City)
225	Westport Academy	Baltimore (City)
88	Wildwood Elementary/Middle	Baltimore (City)
87	Windsor Hills Elementary/Middle	Baltimore (City)
205	Woodhome Elementary/Middle	Baltimore (City)
201	Calvert Middle	Calvert
116	Mill Creek Middle	Calvert
315	Northern Middle	Calvert
111	Southern Middle	Calvert
318	Windy Hill Middle	Calvert
802	Colonel Richardson Middle School	Caroline
302	Lockerman Middle School	Caroline
1306	Mount Airy Middle	Carroll
801	North Carroll Middle	Carroll
105	Northwest Middle	Carroll
508	Oklahoma Road Middle	Carroll
807	Shiloh Middle	Carroll
504	Sykesville Middle	Carroll
701	Westminster East Middle	Carroll
703	Westminster West Middle	Carroll
206	Bohemia Manor Middle	Cecil
313	Cherry Hill Middle	Cecil

School ID	School Name	District by County
303	Elkton Middle	Cecil
504	North East Middle	Cecil
606	Rising Sun Middle School	Cecil
621	Patuxent Valley Middle	Charles
701	Perryville Middle	Charles
2305	Ballenger Creek Middle	Frederick
2525	Brunswick Middle	Frederick
227	Crestwood Middle	Frederick
225	Gov. Thomas Johnson Middle	Frederick
219	Monocacy Middle	Frederick
557	Montgomery Village Middle	Frederick
914	New Market Middle	Frederick
918	Oakdale Middle	Frederick
1510	Thurmont Middle	Frederick
716	Urbana Middle	Frederick
211	West Frederick Middle	Frederick
714	Windsor Knolls Middle	Frederick
511	Northern Middle School	Garrett
708	Southern Middle School	Garrett
265	Aberdeen Middle	Harford
372	Bel Air Middle	Harford
177	Edgewood Middle	Harford
386	Fallston Middle School	Harford
679	Havre de Grace Middle	Harford
184	Magnolia Middle	Harford
583	North Harford Middle	Harford
188	Patterson Mill Middle School	Harford
374	Southampton Middle	Harford
374	Vanguard Collegiate Middle	Harford
108	Bonnie Branch Middle	Howard
216	Burleigh Manor Middle School	Howard
106	Elkridge Landing Middle	Howard
202	Ellicott Mills Middle	Howard
405	Glenwood Middle	Howard
607	Hammond Middle School	Howard
518	Harpers Choice Middle	Howard
617	Lake Elkhorn Middle	Howard
104	Mayfield Woods Middle	Howard
624	Murray Hill Middle	Howard

School ID	School Name	District by County
610	Oakland Mills Middle	Howard
209	Patapsco Middle	Howard
216	Plum Point Middle	Howard
110	Thomas Viaduct Middle	Howard
512	Wilde Lake Middle	Howard
402	Kent County Middle School	Kent
787	A. Mario Loiederman Middle	Montgomery
823	Argyle Middle	Montgomery
333	Benjamin Banneker Middle	Montgomery
335	Briggs Chaney Middle	Montgomery
606	Cabin John Middle	Montgomery
818	Col. E. Brooke Lee Middle	Montgomery
820	Earle B. Wood Middle	Montgomery
248	Forest Oak Middle	Montgomery
311	Francis Scott Key Middle	Montgomery
554	Gaithersburg Middle	Montgomery
345	Hallie Wells Middle	Montgomery
247	John H. Poole Middle	Montgomery
705	John T. Baker Middle	Montgomery
211	Julius West Middle	Montgomery
708	Kingsview Middle	Montgomery
522	Lakelands Park Middle	Montgomery
107	Martin Luther King Jr. Middle	Montgomery
311	Middletown Middle	Montgomery
115	Neelsville Middle	Montgomery
792	Newport Mill Middle	Montgomery
413	North Bethesda Middle	Montgomery
812	Parkland Middle	Montgomery
562	Redland Middle	Montgomery
105	Ridgeview Middle	Montgomery
237	Robert Frost Middle	Montgomery
707	Rocky Hill Middle	Montgomery
155	Rosa M. Parks Middle	Montgomery
521	Shady Grove Middle	Montgomery
835	Silver Creek Middle	Montgomery
647	Silver Spring International Middle	Montgomery
778	Sligo Middle	Montgomery
232	Tilden Middle	Montgomery
412	Westland Middle	Montgomery

School ID	School Name	District by County
811	White Oak Middle	Montgomery
507	William H. Farquhar Middle	Montgomery
509	Accokeek Academy	Prince George's
645	Andrew Jackson Academy	Prince George's
104	Beltsville Academy	Prince George's
615	Benjamin Stoddert Middle	Prince George's
714	Benjamin Tasker Middle School	Prince George's
2108	Buck Lodge Middle	Prince George's
2011	Charles Carroll Middle	Prince George's
660	Drew Freeman Middle	Prince George's
1010	Dwight D. Eisenhower Middle	Prince George's
1348	Ernest Everett Just Middle	Prince George's
1320	G. James Gholson Middle	Prince George's
2141	Greenbelt Middle	Prince George's
1104	Gwynn Park Middle	Prince George's
1602	Hyattsville Middle	Prince George's
912	Isaac J. Gourdine Middle	Prince George's
1510	James Madison Middle	Prince George's
1330	Kenmoor Middle	Prince George's
1326	Kettering Middle	Prince George's
110	Martin Luther King Jr. Middle	Prince George's
1718	Nicholas Orem Middle	Prince George's
1234	Oxon Hill Middle	Prince George's
1428	Samuel Ogle Middle	Prince George's
915	Stephen Decatur Middle	Prince George's
622	Thurgood Marshall Middle School	Prince George's
1908	William Wirt Middle	Prince George's
303	Centreville Middle School	Queen Anne's
407	Matapeake Middle School	Queen Anne's
404	Stevensville Middle School	Queen Anne's
1303	Somerset 6/7 Intermediate School	Somerset
807	Esperanza Middle	St. Mary's
305	Leonardtown Middle	St. Mary's
404	Margaret Brent Middle	St. Mary's
101	Spring Ridge Middle	St. Mary's
106	Easton Middle	Talbot
602	Boonsboro Middle	Washington
401	Clear Spring Middle	Washington
304	E. Russell Hicks Middle	Washington

School ID	School Name	District by County
2102	Northern Middle	Washington
704	Smithsburg Middle	Washington
1308	Bennett Middle Include	Wicomico
910	Salisbury Middle	Wicomico
510	Wicomico Middle	Wicomico
308	Stephen Decatur Middle	Worcester

APPENDIX G

SUMMARY OF PSSE SCORES BY MARYLAND ZIP CODE

Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE
20607	4.9	20785	3.3	21014	4.5	21206	2.4	21228	3.8
20613	2.8	20794	3.4	21014	5.1	21206	2.8	21229	2.7
20639	4.4	20816	5.4	21015	4.6	21206	3.5	21229	3.1
20650	3.8	20817	4.2	21030	3	21207	2.6	21229	3.4
20653	2.7	20832	4.6	21037	4.3	21207	2.9	21229	3.6
20653	2.8	20832	5.9	21040	3	21207	3.7	21229	4
20657	2.3	20837	5.6	21042	4.9	21208	2.9	21229	4.3
20657	4	20850	5	21043	4.5	21209	5.1	21229	3.6
20659	3.2	20850	5.8	21043	4.5	21211	6.1	21230	3.1
20659	3.6	20853	4.1	21043	5.3	21212	3.6	21230	3.3
20678	4.1	20853	4.6	21044	2.9	21212	4.1	21230	4.5
20705	2.7	20854	4.9	21044	4	21213	4.3	21230	4.8
20705	3.8	20855	4.7	21045	2.3	21213	3.7	21231	4.6
20708	2.5	20866	3.2	21045	4.4	21214	3.1	21234	2.7
20711	3.1	20871	4.6	21047	5.2	21214	3.3	21234	3.1
20715	2.3	20871	5.7	21054	3.6	21215	1.9	21236	3.2
20715	3.2	20872	4.5	21060	4.4	21215	3.5	21237	2.7
20721	2.8	20874	2.5	21061	3.4	21215	3.8	21244	3.4
20723	3.9	20874	3.7	21074	4.2	21215	4.5	21401	3.4
20723	4.6	20874	4.1	21074	4.4	21216	2.8	21403	3.1
20735	3.5	20876	2.8	21075	4.1	21217	4	21502	3.7
20736	3.5	20877	3.2	21075	4.4	21218	3.5	21502	2.9
20736	4	20877	4.1	21076	4.4	21218	3.7	21520	7.2
20737	3.5	20877	4.3	21078	4.1	21218	3.9	21539	4
20744	2.9	20878	4.9	21085	2.9	21219	2.8	21545	4.5
20744	3.8	20878	4.1	21090	2.7	21220	2.8	21550	3.8
20746	2.9	20886	4.1	21093	3.8	21221	2.6	21601	2.8
20747	2	20895	4	21108	3.2	21222	1.9	21617	5
20748	2.5	20895	5	21108	3.9	21222	2.1	21620	2.8
20748	2.8	20902	3.5	21111	4.5	21222	2.7	21629	2.8
20755	2.8	20902	4.3	21113	3.6	21222	2.9	21632	3.9
20755	2.9	20903	3.3	21122	2.4	21223	3.2	21666	3.9
20770	2.8	20904	5	21122	3.2	21223	4.1	21666	4.3
20772	2.7	20904	5.3	21132	5	21224	4.2	21701	3.5
20774	2.9	20905	3.8	21136	2.3	21225	2.2	21701	3.9
20781	3.3	20906	4	21146	4.8	21225	3.3	21701	5.8
20782	3.8	20906	4.1	21157	3.2	21225	3.5	21702	2.9

Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE	Zip Code	PSSE
20783	4.6	20910	3.2	21157	4	21225	3.7	21703	2.8
20784	3	21001	2.6	21205	3.6	21227	3.1	21703	3.9
20785	2.5	21012	4.8	21205	3.9	21227	3.3	21713	4.4
21716	3.9	21774	4.9	21826	3				
21722	5.8	21783	5	21871	2.9				
21738	5.8	21784	4.5	21901	3.1				
21740	3.4	21784	5	21903	3.5				
21742	3.9	21787	3.4	21911	3.9				
21754	3.1	21788	2.6	21915	3.5				
21754	4.1	21795	3.7	21921	3.3				
21754	4.3	21801	2.8	21921	3.5				
21769	4.5	21804	3.1	21921	4.6				
21771	5.4	21811	3.6						