

THE IMPACT OF MINDSET, RELATIONSHIPS, ENGAGEMENT, AND HOPE ON
PREDICTING HIGH SCHOOL STUDENTS' LEVEL OF RISK

by

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ABSTRACT

Failing to complete high school has lasting personal, social, and economic consequences for students. Multiple factors, including low or failing grades, poor school attendance, and low standardized test scores place students at risk of dropping out of school. Schools, state, and federal government sources have contributed significant resources to assisting students who are categorized at risk for dropping out of school, yet the four year graduation rate remains at only 84% (National Center for Education Statistics, 2018).

Using Bronfenbrenner's (2005b) Bioecological Model of Human Development, the purpose of this study was to determine to what extent beliefs about mindset, engagement, hope, and relationships predict level of risk for high school students. This study used a quantitative approach and survey research methodology. Participants were 319 high school students from a suburban high school in the Midwest region of the United States. Demographic variables as well as independent variables regarding effort, natural ability, engagement, student relationships and aspects of hope were considered for analysis.

Hierarchical multiple regression analysis indicated a fixed mindset with respect to natural ability, a lack of positive relationships with peers, a lack of positive relationships with another adult in school, and a lack of belief that one will graduate from high school were statistically significant predictors of the level of risk for high school students. Implications for school leaders, teachers, and students are discussed as well as potential future research.

CHAPTER 1

INTRODUCTION

The concept of intelligence is complex. Though intelligence is something all humans possess, there are two thoughts regarding the malleability of intelligence. One school of thought is that intelligence is a fixed trait. The premise of this entity theory of intelligence is that intelligence is something one is born with in a fixed amount (Dweck, 2000). Persons who hold an entity theory of intelligence are often referred to as having a fixed mindset (Dweck 2006). Conversely, a second theory of intelligence refers to intelligence as a malleable characteristic. The premise of this incremental theory of intelligence is that intelligence is something that can be changed through effort and learning (Dweck, 2000). Persons who hold an incremental theory of intelligence are often referred to as having a growth mindset (Dweck, 2006).

Fortunately, intelligence is not as dichotomous as thinking it must be fixed or malleable. Persons who display a fixed mindset in one area may subscribe to a growth mindset in another (Dweck, 2008; Dweck, Chiu & Hong, 1995; Stump, Husman, Chung & Done, 2009). For example, one may see science skills as something in which they can improve while also viewing math skills as a fixed ability. In this way, a growth or fixed mindset is rarely an all or nothing belief for an individual.

Even if students display a predominately fixed or growth mindset, research has shown it is possible to induce or influence students' mindsets experimentally (Donohoe, Topping, & Hannah, 2012; Esparza, Shumow & Schmidt, 2014; Schroder, Donnellan, Moran, & Moser, 2014; Yeager, Trzesniewski, & Dweck, 2013). In these studies, students who were exposed to interventions designed to influence their mindset toward a growth state did show increases in their self-reported incremental theories of intelligence. However, even simple feedback can also

have both positive and negative effects on students' views of their own intelligence (Lessard, Grossman & Syme, 2015; Rattan, Good, & Dweck, 2012). Feedback in the form of praise and person-centered messages can have a detrimental effect on students' abilities to see intelligence as something that is malleable. Conversely, feedback that focuses on effort may increase a student's ability to see intelligence as something that can be changed.

Statement of the Problem

Success in school is often defined in terms of academics. Students' mindsets can affect how they interpret and respond to academic performance. For example, students holding a fixed mindset will more likely associate academic success or failure as a direct result of their innate intelligence, while those students subscribing to a growth mindset will likely associate academic success or failure with personal effort or strategy. Students in the latter category are also more likely to focus on mastery of learning objectives versus performance on a particular task (Dweck, 2000; Dweck, 2006; Dweck, Chiu & Hong, 1995; Grant & Dweck, 2003; Yeager & Dweck, 2012). Thus, measuring a student's beliefs about mindset could have predictive value in determining the likelihood of academic success.

Examining students' mindsets with respect to failure and effort could provide a more thorough understanding of why some students are successful academically while others are not. Academic success is necessary if one expects to complete formal education and graduate. Students who do not experience academic success in school, as indicated by low or failing grades and/or low standardized test scores, are more likely to drop out of school before earning the credits necessary to graduate (Bowers, 2018; McKee & Caldarella, 2016). Thus, understanding potential mindset differences between academically successful and academically unsuccessful students is an important step in combating the problem of dropping out of school.

Often these unsuccessful or low-achieving students are labeled at-risk of dropping out of school, and, as such, have a variety of factors that negatively influence their ability to be successful in school. According to a 2007 report by the National Dropout Prevention Center/Network and Communities in Schools, a number of factors can place additional responsibilities and stress on students, making them at-risk for dropping out of school (Hammond, Linton, Smink & Drew, 2007). These factors fall into the following categories: Individual Background Characteristics; Early Adult Responsibilities; Social Attitudes, Values, and Behavior; School Performance; School Engagement; School Behavior; Family Background Characteristics; and Family Engagement/Commitment to Education. Factors in these categories are recognized by states and school districts, and they classify and track students displaying two or more of these risk factors. Examples of these factors may include excessive absences, a lack of participation in school activities, alcohol and/or drug abuse, low socioeconomic status, low or failing grades, and underachievement on standardized tests.

Programs aimed at reducing the number of students who drop out of school target the risk factors for dropping out of school in a variety of ways. Numerous studies have addressed the effects of various programs and their alignment to at-risk factors (Doll, Zohreh, & Walters, 2013; Hunt et al., 2002; Somers & Piliawsky, 2004; Suh & Suh, 2007; Weir, 1996). In general, interventions that are more targeted and aligned to particular risk factors are more effective with students displaying those factors versus interventions that are more general in scope (Suh & Suh, 2007). According to Weir (1996) there are certain factors more within the circle of control of schools. These factors fall into three main categories: organizational components (i.e., low student to teacher ratio, staff professional development, flexible schedule, etc.); instructional components (i.e., career development and exploration curricula, computer assisted instruction,

wide variety of instructional materials, etc.); and interpersonal components (i.e., caring staff members, positive climate and culture, emotional support for students, etc.). The specificity of these factors has helped schools develop programming and structural changes to address these factors in order to prevent at-risk students from dropping out of school.

Despite greater understanding of at-risk factors and the implementation of corresponding programming to mediate these factors, there are still a number of students who ultimately drop out of school. The consequences of dropping out of school are significant and lasting. These consequences range from personal to societal. On a personal level, students who drop out of school are more likely to be unemployed or underemployed, which can lead to personal financial challenges (Baturina, Berc, & Majdak, 2014). They are more likely to experience physical and/or mental health problems as well as have decreased psychological well-being and more social exclusion than students who graduate. On a societal level, students who drop out of school are less likely to be civically engaged in their communities (Baturina, Berc, & Majdak, 2014). Unemployment and underemployment by high school dropouts can also have a financial impact on society as these students are more likely to rely on government-funded social programs for financial assistance (Theunissen, Ilse, Verdonk, Feron, & Bosma, 2012).

Considering the impact of low academic achievement on a student's risk for dropping out of school and the impact of a student's mindset on their interpretation and response to academic failure or setbacks, the mindset of students considered to be at-risk is something that needs to be examined further. Determining the significance of at-risk students' beliefs about mindset when compared to students not considered at-risk is an area to examine. As previously stated, a student's engagement in school, or lack thereof, can be a factor in determining how likely they are to drop out before graduating. Examining the relationship between student engagement and

school, beliefs about mindset, and academic success would provide a unique view of mindset and how it may predict a student's level of risk.

Considering academic success is arguably the most important outcome of a student's educational experience, the impact of non-academic factors as a significant predictor of academic success should also be considered. Hope is one of the non-academic factors that was considered for the purposes of this study. Hopeful students were 2.8 times more likely to indicate they get excellent grades than non-hopeful peers according to the 2016 Gallup Student Poll, which was administered to 915,214 United States students (Gallup, 2016). Further, hopeful students were also more likely to indicate post-secondary plans which included further education (Gallup, 2016). The impact of hope on academic success is not limited to K-12 students. In a 2002 study, Snyder et al., found students' hope upon entering college was a significant predictor of college students' grade point averages, likelihood of graduating, and reduced dismissal/dropout rates. Considering the influence of hope on academic performance, an examination of the relationship between students' mindset with respect to hope is also necessary.

Purpose of the Study

The purpose of this study was to examine the relationships between students' engagement, relationships, beliefs about mindset, and risk factors for dropping out of school. This study aimed to determine what statistically significant relationships exist between these variables and the level of risk for a student.

Research Questions

1. What are the demographics of the participants in this data set?
2. To what extent is there a statistically significant difference between at-risk and not at-risk participants based on a) demographics (gender and age), b) engagement (behavioral and

cognitive), c) relationships (peer, teacher, and adult), and d) mindset (intelligence, hope, effort, views on failure)?

3. To what extent do mindset, effort, engagement, relationships, and hope predict the level of risk for a student?

Significance of the Study

An examination of students' mindsets on intelligence, hope, effort, and views on failure and the relationship of these mindsets to both academic and non-academic risk factors is important in understanding the impact of mindset on students' likelihood to be at-risk. If, as Grant and Dweck (2003) conclude, students with a growth mindset are more likely to focus on mastery of learning objectives versus performance on an individual task, then a student's mindset is very important in ensuring students actually learn and understand content and skills in order to leave school prepared for future challenges. Further, as Snyder et al. (2002) demonstrated the relationship between hope and academic success, an examination of the impact of students' mindset with respect to hope would show how mindset predicts students' beliefs about this important non-academic factor that also influences academic performance as a measure of risk-status.

Conceptual Framework

A theory in quantitative research helps to bridge the independent and dependent variables in a study by providing "an overarching explanation for how and why one would expect the independent variable to explain or predict the dependent variable" (Creswell, 2014, p. 54). In this way, a theory provides an explanation of the relationship between the variables to provide context for the study so that the researcher can explain and predict how one variable (i.e., cognitive or behavioral engagement in school) may impact another variable (i.e., level of risk). In

this example, if students have low cognitive and/or behavioral engagement in school, the likelihood of having one or more risk factors should increase.

As discussed by Hammond, Linton, Smink and Drew (2007), a number of factors place additional responsibilities and stress on individual students making them more at risk for not successfully completing school. These characteristics range from personal responsibilities and stresses outside of school to stresses that occur as part of a student's school experience. Bronfenbrenner's (2005a) Bioecological Theory explains human development as the relationship between the impact of one's environment and one's biology. The theory holds that as one encounters different environments throughout their lifespan, these environments may influence all aspects of one's development and behavior in varying degrees. The experiences students have both at home and in school contribute to their behavioral responses to school experiences and the likelihood they will successfully finish school.

Bronfenbrenner (2005b) posits there are multiple systems and interactions within and between these systems which affect the course of a human's development. These systems are: microsystem, mesosystem, exosystem, macrosystem, and chronosystem. For the purposes of this study, a student's microsystem contains their immediate environments to which they have regular and direct access (i.e., school, family, friends, neighborhood, etc.). Proximal processes, regular interactions between a person and these immediate environments, work over time to produce and sustain one's development. "For outcomes reflecting development of competence (e.g., mental ability, academic achievement, social skills) proximal processes are posited as having greater impact in more advanced and stable environments throughout the life course" (Bronfenbrenner, 2005b, p. 5). Considering the factors Hammond, Linton, Smink, and Drew (2007) describe that put students at risk for dropping out of school, in this study, more advanced

and stable environments could be interpreted to contain higher behavioral and cognitive engagement for students and positive relationships experienced by students. As applied to this study, Bronfenbrenner (2005b) would predict students with higher behavioral and cognitive engagement and positive relationships would have fewer risk factors for dropping out of school, as they would have fewer failing grades, higher standardized test scores and less absenteeism. For the purposes of this study, behavioral and cognitive engagement and relationships are part of a student's microsystem.

In addition to students' perceptions of engagement and relationships, their perceptions of mindset are being examined in this study. Mindset is a system of beliefs about one's abilities that has grown out of research involving implicit theories of intelligence. Mindset beliefs vary from fixed to malleable in terms of whether one's characteristics are inherited and innate to whether one's characteristics can grow and change with effort and learning (Dweck, 2000; Dweck, 2006). The mindset of a student has been linked to academic achievement. Perhaps one of the broadest analyses of the impact of having a growth mindset on academic achievement, was completed by Burnette et al. (2012). In their meta-analysis, involving 28,217 participants from ages five to 42, they concluded those individuals who held a growth mindset had higher rates of goal achievement than those holding a fixed mindset. Further, they concluded those with incremental beliefs about ability and intelligence held mastery goals, as opposed to performance goals, such that when goals were achieved they resulted in learning. Further supporting the impact of a growth mindset on academic achievement, Henderson and Dweck (1990) found students who held a growth mindset were more likely to have higher grades and experience greater academic improvement than their fixed-minded peers during the transition from elementary to middle school. In a longitudinal study following students from sixth to eighth grades, Romero, Master,

Paunesku, Dweck, and Gross (2014) found those with a growth mindset were likely to have higher grades despite taking harder classes. They also found students with a growth mindset were more likely to be enrolled in advanced math classes than those students with a fixed mindset. Likewise, Blackwell, Trzesniewski, and Dweck (2007) found middle school students with a growth mindset at the beginning of seventh grade had higher grades in mathematics at the end of their eighth-grade year in school after controlling for the effect of math achievement prior to entering junior high. For the purposes of this study, mindset and academic achievement are also part of a student's microsystem.

Considering the evidence linking growth mindset to higher academic achievement, one could conclude holding a growth mindset could also be considered a factor in an advanced and stable environment as described by Bronfenbrenner (2005b). Thus, it is predicted that students who hold a growth mindset with respect to factors such as effort, views on failure, intelligence, and hope for the future would also have higher academic achievement as measured by standardized assessments and less low or failing grades in classes. As these are both considered risk factors for dropping out of school, one could conclude those students who hold a growth mindset would be less likely to display one or more risk factors for dropping out of school.

In Bronfenbrenner's (2005b) Bioecological Model of Human Development, the mesosystem consists of the interactions between elements of the microsystem. Located in the mesosystem is the accumulation of life experiences and their interactions that influences one's development. Data collection for the purposes of this study focused on elements of the microsystem and the impact of these elements on each other. Specific analysis at the level of mesosystem was not conducted for the purposes of this study.

In this study, no data were collected with respect to the exosystem. The exosystem, according to Bronfenbrenner (2005b), contains the individual and elements not directly connected to the individual. However, while these elements do not contain the individual, they do have an impact on the development of the individual through their linkages with other elements. For example, laws and regulations passed by legislative bodies which impact schools are considered part of a student's exosystem.

Bronfenbrenner (2005b) describes a macrosystem as an overarching system of culture, customs, and lifestyle that impacts the developing person by bringing together the three sub-systems of exosystem, mesosystem, and microsystem. Examples of elements in this system include age, gender, ethnicity, and socioeconomic status. For this study, age and gender were examined.

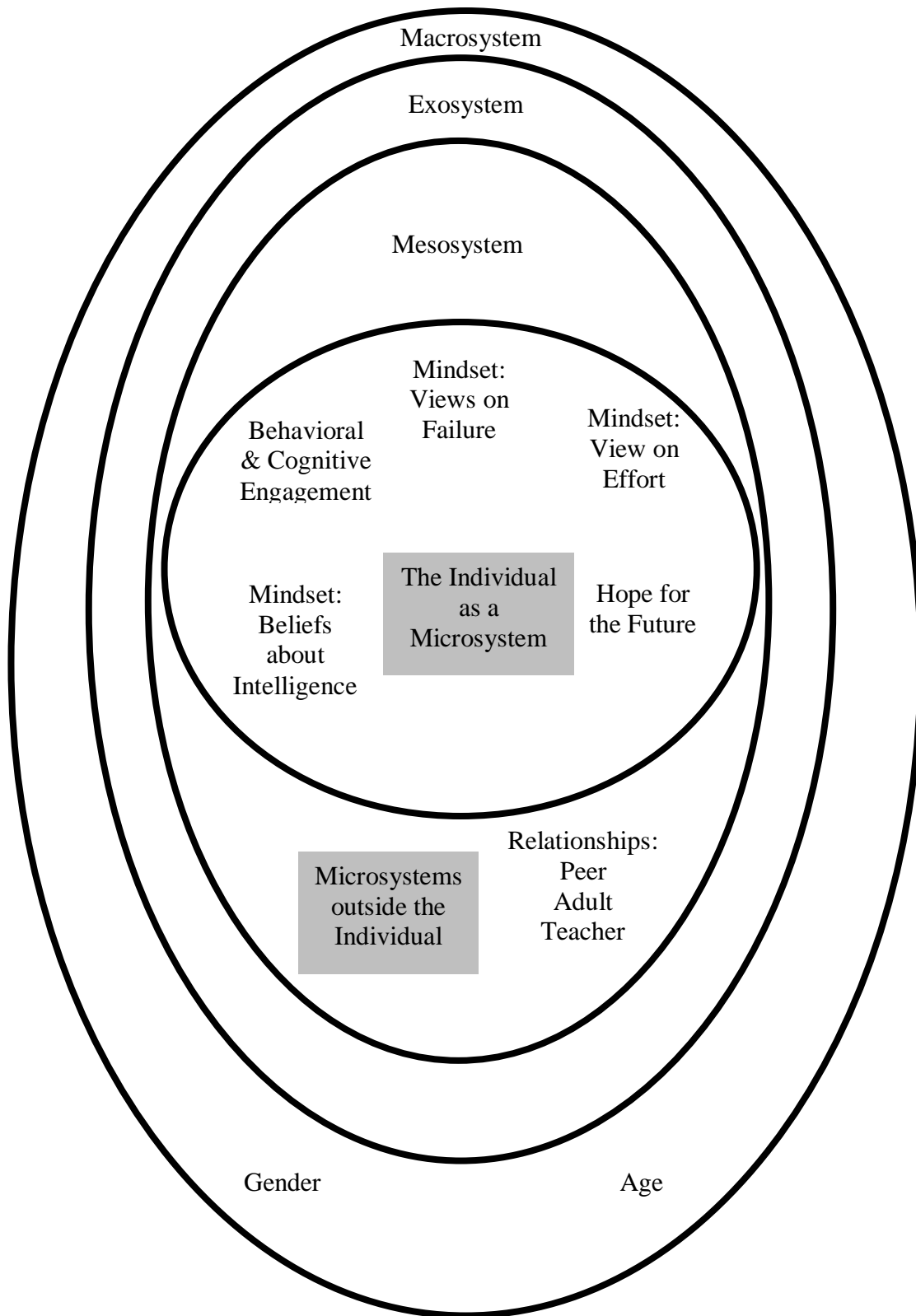


Figure 1.1. Conceptual Framework – Based on Bronfenbrenner's (2005a) Bioecological Model of Human Development

Definitions of Key Terms

At-Risk – students who exhibit a variety of factors that negatively influence their ability to be successful in school. For the purposes of this study, excessive absences, low/failing grades, and underachievement on standardized tests have been considered to identify students as being at-risk for dropping out as these three factors are most considered by the district participating in the study.

EL/ELL – English Learner/English Language Learner is a student whose first language is not English.

Fixed mindset – the belief that one’s intelligence is innate and not able to be changed (Dweck, 2000)

Growth mindset – the belief that one’s intelligence is malleable and can change with effort (Dweck, 2000)

FRL – Free/Reduced Lunch is used as an indicator of poverty and an element considered in at-risk identification of students.

Hope – The ideas and energy students have for the future (Gallup, 2017).

IEP – Individual Education Plan is used to identify specially designed instruction for students with disabilities. These disabilities can be cognitive or physiological.

MCT – minimum competency test. Also known as end-of-course or graduation exam.

MTSS – multi-tiered system of support.

SES – Socioeconomic Status is term used to indicate poverty. Low SES refers to students who qualify for free or reduced lunch, which is an indicator of poverty.

Summary

The purpose of this study was to inform educators of the relationship between student engagement, relationships, mindset, and level of risk for dropping out of school. Specifically, this study aimed to examine connections between engagement, relationships, and mindset among students to determine if there was a relationship between these factors and the level of risk associated with students.

Chapter two provides a summary of the relevant literature that describes current understanding of the variables in the study and how they relate to the conceptual framework. Sections describe current research as it relates to the independent and dependent variables in this study so that the relationships between these variables can be examined.

Chapter three describes the quantitative research design used in this study. Specifically, the methodological approach, sample and participants, and survey instrument are discussed. A description of data analysis includes both the descriptive and inferential statistical analysis procedures used for the purpose of this study.

Chapter four describes the results of statistical analyses used in this study. The chapter includes results from the chi-square, *t*-test, correlations, and hierarchical multiple regression analyses proposed in chapter three. A summary of answers to each question is included.

Chapter five provides a discussion of results from chapter four and a review of the research. Implications for practice and recommendations for future research are included.

CHAPTER 2

LITERATURE REVIEW

The multitude of factors which determine student success in school are varied and complex. Engagement, relationships with peers, teachers, and adults, and mindset as components of a student's microsystem are among those factors that can determine whether or not students are successful in school or at-risk of dropping out.

Students At-Risk

There was a time, around the turn of the 20th century, when high school was reserved for a very selective section of the population (Tyack, 1974). However, as the century progressed, and a high school diploma became an expected credential for an ever-expanding section of the labor market, graduation became the expectation. By the 1960s the idea of a dropout had solidified, but attrition was still seen as an unfortunate, but generally accepted by-product of enrolling more and more students in high school (Tyack, 1974). By 1983, the publication of *A Nation at Risk* by the United States Department of Education (1983) highlighted reasons why the American education system was in need of serious reform. These reasons ranged from functional illiteracy in adults and students, low achievement on a variety of standardized assessments, the rise of remedial courses at the college level, and comparisons to international students showing the United States in a less than favorable light (U. S. Department of Education, 1983). While this report highlighted why education should change to ensure students are adequately challenged and prepared for college and the workforce after graduation, it did not address the problem of dropouts.

Twenty-five years after *A Nation at Risk* (U. S. Department of Education, 1983), the United States Department of Education published *A Nation Accountable* (2008). In this

publication, concerns regarding the rate of students dropping out of high school are addressed. “Educational quality affects individual earnings, and dropouts are much more likely than their peers who graduate to be unemployed, living in poverty, receiving public relief, in prison, on death row, unhealthy, or single parents” (U.S. Department of Education, 2008, p. 11). The problems affecting students who drop out of school are not only theirs to accept and address. These problems have economical and societal implications that affect both adults who have dropped out of school and adults who have successfully completed high school and beyond.

Factors Influencing Students Who Drop Out of School

There are many factors and combinations of factors that influence a student’s decision to drop out of school and, therefore, classify them as at-risk (Bowers, Spratt, & Taff, 2013; Doll, Zohreh, & Walters, 2013; Hammond, Linton, Smink & Drew, 2007; Suh & Suh, 2007).

According to Hammond, Linton, Smink and Drew (2007) the factors which contribute to at-risk status in high school students can be summarized in the following way:

- individual background characteristics (i.e., learning or emotional disability);
- early adult responsibilities (high number of work hours, parenthood);
- social attitude, values and behavior (high-risk peer group, high-risk social behavior, highly socially active outside of school);
- school performance (low achievement, retention/over-age for grade);
- school engagement (poor attendance, low educational expectations, lack of effort, low commitment to school, no extracurricular participation);
- school behavior (misbehavior);
- family background characteristics (low socioeconomic status, low education level of parents, large number of siblings, not living with both natural parents);

- family engagement/commitment to education (sibling has dropped out, lack of conversation about school).

States and school districts track many of these factors in student information systems, and identify students as being at-risk if they display two or more of these factors. The state department of education for the state in which the study was conducted allows individual school districts to select at-risk factors for the purpose of identifying students who may be at risk for dropping out of school. As such, excessive absences, low or failing grades, and underachievement on standardized test scores, was examined further as they pertain to the purposes of this study, as these factors are considered most important to the district participating in the study.

Excessive absences. The definition of chronic absenteeism varies slightly by source, but as the word chronic implies, multiple absences for both traditionally excused and unexcused reasons underlie any definition. Balfanz (2016) defines chronic absenteeism as missing greater than or equal to 10% of the days in a school year for any reason. He further explains the United States Department of Education's Office for Civil Rights uses a figure of 15 or more days missed to constitute chronic absenteeism. In their June, 2016 data collection, the Office of Civil Rights concluded approximately 13% of United States students do not attend school regularly. This number jumps to approximately 20% when only high school students are considered (Balfanz, 2016). These data support the assertion that chronic absenteeism peaks in high school grades, often in grades nine and ten when compulsory attendance laws are still in effect. By eleventh and twelfth grades, chronic absenteeism rates drop slightly, possibly due to the fact that chronic non-attenders have already dropped out of school (Balfanz, 2016).

According to Balfanz and Byrnes (2012), there are four main reasons why students are chronically absent: events and forces outside of school; threat avoidance; disengagement in school; and faulty beliefs about the importance of attendance on the part of a student or primary caregiver. A student's experiences and perceptions of the impact of each of these factors changes as they mature and matriculate through school (Balfanz and Byrnes, 2012). However, it is clear their environment both inside and outside of school has a significant impact on their attendance (Balfanz, 2016).

Chronic absenteeism is positively correlated with an increased risk for dropping out of school and negatively correlated to student achievement (Balfanz, 2016; Balfanz & Byrnes, 2012; Krenitsky-Korn, 2011; Mayer & Mitchell, 1993; Rumberger, 2011). Balfanz (2016) points out that “academic achievement from kindergarten on, high school graduation, and postsecondary enrollment are all highly sensitive to absenteeism” (p. 10). Chronic absenteeism in middle school and high school are all negatively linked to later achievement levels and likelihood of dropping out of school. Further, according to Balfanz and Byrnes (2012), school attendance is a strong predictor of course performance in high school and positive course performance is a predictor of the likelihood of graduating on time. Kearney and Graczyk (2013) point out:

School attendance provides youth a setting for academic development, a language-rich environment, opportunities to develop social competence and relationships, and experiences that nurture work-related skills such as persistence, problem-solving, and the ability to work with others to accomplish a goal. (p. 2).

Low or failing grades. Grades serve as a way to quantify and communicate student learning in the classroom. Multiple factors including the teacher's educational background,

philosophical beliefs of the teacher, institutional expectations regarding grading and assessment, assessment criteria, psychosocial pressure, and the amount and quality of student learning evidence collected can all impact grades students receive (Allen, 2005; Yorke, 2011). While these multiple factors could influence what a low or failing grade means, low or failing grades can also indicate a lack of academic preparation and understanding of course content on the part of students (McKee & Caldarella, 2016). Grades of F indicate a complete lack of mastery of course concepts, while grades of D indicate minimal understanding or progress and a danger of failing on the part of the student. As such, these grades can be predictive of future academic performance on the part of the student and manifest in further course failures and lack of accumulated credits, leading a student to drop out of school (Mac Iver, 2010).

Multiple studies have attempted to show a predictive relationship between students' GPA or low/failing grades and their likelihood of dropping out of school prior to graduation. Mac Iver (2010) found in his study of 2008-09 dropouts that 92.7% of these students had failed at least one course in the year prior to dropping out. Further 63.0% of dropouts had failed four or more courses. Allensworth and Easton (2007) found in their longitudinal study of dropout students that less than half of ninth grade students who failed three or more courses graduated on time and students who failed even one course had graduation rates 20% lower than students who passed all of their courses. In their longitudinal study of over 13,000 students, Balfanz, Herzog, and Mac Iver (2007) found sixth grade course failure in English or mathematics was a better predictor of not graduating than low test scores. "Fourteen percent of the sixth graders failed mathematics and only 19% of these students ultimately graduated from the school district within one year of on-time graduation" (Balfanz et al., p. 228). For English classes, these percentages were 11 and 18 respectively. In a thorough analysis of multiple studies which looked at various indicators of

student dropout rates, Bowers, Sprott, and Taff (2013) found that “some of the most accurate indicators that use cross-sectional data, focus on low or failing grades” (p. 97).

Academic success is a prerequisite for on-time graduation from high school. Students who experience success academically will accumulate the credits necessary to fulfill graduation requirements. Students who are not successful academically will fail classes and fall further and further behind, putting them at risk for dropping out. Casillas et al. (2012) found that prior grades and standardized achievement were the strongest predictors of future grade point average as an indicator of academic success. Bowers (2010) conducted a longitudinal study of 193 students to determine the effects of non-cumulative grade point average as calculated by averaging all of a student’s grades for each year they are in school. Students who had a non-cumulative grade point average in the lowest category, indicating a grade point average of 0 to 1.5 had a “drastically increased risk of dropping out” (Bowers, 2010, p. 203). “It appears that teacher-assigned grades were highly predictive of a student’s risk of dropping out, suggesting that grades are useful and should play a much larger role in the prediction of a student’s at-risk status” (Bowers, 2010, p. 203).

Underachievement on standardized assessments. The federal reauthorization of the Elementary and Secondary Education Act in 2001, also known as the No Child Left Behind Act, outlined accountability provisions for schools. In particular, the focus on standardized testing as a measure of school and individual student achievement increased. As Gunzenhauser (2003) explains, standardized tests are an approximation of student achievement, indicating a student’s knowledge of subject matter. These measures not only approximate a student’s subject matter knowledge, they also provide a comparison of student performance relative to other students taking the same exam.

The impact of standardized testing on high school dropout rates is difficult to generalize to a diverse student population, as low standardized test scores appear to impact groups of students in different ways. For example, Yeh (2016) found in a study of over 27,000 students in a nationally represented cohort that an increase of one standard deviation from mean test scores in reading and math was predicted to reduce the number of black males who drop out of school by 51.6% and the number of Hispanic males who drop out by 61.7%. However, the same increase in math and reading test scores did not predict a significant decrease in drop out numbers for other demographic groups. But it is not only racially diverse students who are differentially affected by high stakes exams. A study by Papay, Murnane, and Willett (2010) found that barely failing a high-stakes tenth grade mathematics exam was associated with a decrease in the probability of on-time graduation of eight percentage points for low-income, urban students in Massachusetts. Ou (2010) found similar results for students in New Jersey.

Much of the research surrounding the impact of standardized testing on dropout rates has centered on high-stakes, minimum competency tests (MCT), also known as end-of-course or graduation exams. Multiple studies have found that racial/ethnic minority students, students from low socioeconomic backgrounds, English Language Learners, and students with academic disabilities are at a significantly increased risk of dropping out due to low performance on these exams than are their peers without these characteristics (Griffin & Heidorn, 1996; Harris & Harrington, 2006; Horn, 2003; Jacob, 2001; Lillard & DeCicca, 2001; McSpadden McNeil, Coppola, Radigan, & Vasquez Heilig, 2008). Interestingly, Griffin and Heidorn (1996) found in their study of over 76,000 students in Florida high schools, that students with higher grade point averages were more likely to drop out of school if they barely failed a minimum competency test (MCT). They found no significant increase in the likelihood of dropping out for students who

had low grade point averages and failed a minimum competency test. While low-achieving students in states where minimum competency testing was required were not at an increased risk of dropping out as a result of failing an MCT, when compared to their peers in states that do not require an MCT exam they were significantly more likely to drop out. Students in the bottom 10% of achievement were 33% more likely to drop out than peers in non-test states (Jacob, 2001).

Student Engagement in School

Student engagement in school has been studied from various perspectives: educational, psychological, and developmental, and has resulted in an “increasingly multidimensional understanding of what student engagement is and how it contributes to the understanding of youth development and educational outcomes” (Furlong, et al., 2003, p. 101). Engagement is viewed as both a process and an outcome. As a process, engagement manifests as life-long learning. As an outcome, engagement represents a sense of personal connectedness to school (Furlong, et al., 2003). The student context of school engagement includes both the behavioral and cognitive dimensions. However, behavioral engagement on the part of students, which is easily observable, cannot be interpreted as a proxy for cognitive engagement (Axelson & Flick, 2010). In 2003, Furlong, et al., stated “behavioral engagement encompasses participation, task involvement, and prosocial conduct. Cognitive engagement is centered on self-regulation, strategic thinking, and psychological investment” (p. 101). For the purposes of this study, behavioral and cognitive engagement were considered together as both constitute important components of a student’s microsystem, with survey questions designed to assess students’ level of each. Direct observation of behavioral engagement was not conducted.

Behavioral and Cognitive Engagement

Fredricks, Blumenfeld, and Paris (2004) contextualize engagement as a multidimensional construct that is difficult to separate into parts. Behavioral engagement, the more easily observable component in day-to-day activities, includes active participation and involvement in academic work and school activities. As stated by Furlong, et al., in 2003 “the behavioral component of school engagement encompasses the student’s interactions and responses within the classroom, school, and extracurricular environments” (p. 103). Cognitive engagement is more internal. This type of engagement is a willingness on the part of a learner to put forth effort, do the work, and understand what they are learning (Fredricks, Blumenfeld, & Paris, 2004). However, engagement is not a dichotomous occurrence. Rather, each component of engagement exists on a continuum. For example, behavioral engagement can range from simply doing the minimal work required to taking on leadership roles. Cognitive engagement can likewise range from efforts to understand the minimum requirements to initiating opportunities to apply and extend knowledge to new and unfamiliar situations. These qualitative differences in the degree of engagement create the potential for changes in engagement over time and in different environments (Fredricks, Blumenfeld, & Paris, 2004). For example, in more advanced and stable environments, one might expect higher levels of engagement. However, should circumstances within a student’s mesosystem change, it may alter their degree of engagement in school. In this way, it is clear that the multidimensionality of engagement could be a result of interactions between students and their environments.

Past research regarding the student context of engagement has found that school engagement is generally considered to hold positive influences for all students (Furlong, et al., 2003). Considering Bronfenbrenner’s (2005b) Bioecological Model of Human Development, the

positive impact of engagement on student learning outcomes could be taken to mean that high engagement is an indicator of an advanced and stable learning environment where proximal processes between microsystems have positive impacts on a student's development. Both the quality of engagement, the degree to which a student is engaged in learning, and the quantity of engagement, the amount of time a student is engaged in learning, have been shown to positively impact student learning outcomes (Fredricks, Blumenfeld, & Paris, 2004; Gettinger & Walter, 2012; Guthrie, Wigfield, & You, 2012; Janosz, 2012; Rumberger & Rotermund, 2012). For example, Fredricks, Blumenfeld, and Paris (2004) describe a positive correlation between behavioral engagement and student achievement as measured by standardized test scores and grades. When tests measuring higher level skills like analysis and synthesis were used to measure student achievement, a positive correlation between higher scores and those students with higher self-reported levels of cognitive engagement was evident. Guthrie, Wigfield, and You (2012) supported this correlation by showing that higher levels of behavioral engagement in students resulted in higher reading achievement, as measured by standardized exams, and higher student grades. Further, Janosz (2012) described engagement as a major determinant of school success. Behavioral and cognitive engagement, in the context of the classroom and learning activities, "strongly predicts achievement and learning competencies" (Janosz, 2012, p. 696). Sever, Ulubey, Toramen, and Türe (2014) found significant differences with respect to engagement in high school students who self-reported the degree to which they were academically successful, with those being most engaged also reporting the highest levels of academic success. In addition to the degree of engagement of students in learning, the amount of time students are actively engaged in learning activities has also been shown to positively impact student achievement. Gettinger and Walter (2012) considered the amount of time students are

engaged in learning; specifically, “a strong predictor of academic achievement is the amount of time students are actively engaged in learning” (p. 654). From both qualitative and quantitative perspectives, higher student engagement correlates to positive learning and achievement results.

Student engagement has also been considered within the specific context of high school completion. Lovelace, Reschly, Appleton, and Lutz (2014) found in a study of over 35,000 students, that “student Engagement Index self-ratings in ninth grade students predicted dropout and on-time graduation four years later with considerable consistency” (p. 518). Lower levels of self-reported engagement in school were associated with higher levels of dropping out of school and lower levels of four-year high school completion. In an analysis of 35 studies examining various measures of engagement in high school, Rumberger and Lim (2008) found that higher levels of engagement reduced the likelihood a student would drop out of school prior to graduating. When also considering similar studies involving middle school and elementary school students, the results were less predictive. The results were most reliable for high school students, indicating more predictive power for engagement measures in older students with respect to high school completion. Finn and Rock (1997) specifically considered minority, low-income students when examining the impact of behavioral engagement on successful completion of high school. In their study of 1,803 students, those who graduated on time and enjoyed greater academic success were also significantly more behaviorally engaged in school as indicated by active participation in class work, preparedness for school, and effort on homework than their peers who were not academically successful and did not complete high school on time or at all. The impact of engagement on successful high school completion is not limited to those students who may already struggle academically when coming to high school. Landis and Reschly (2013)

found that gifted students who dropped out of high school prior to completion were also not engaged in school.

Though both academic success and dropping out of school prior to completion are multifaceted issues, the impact of engagement as a microsystem on student development with respect to academic success and the potential for dropping out of school cannot be ignored. Student engagement, or lack thereof, has been consistently identified as an important factor in dropping out of school and student academic achievement.

Relationships

Relationships Between Students and Teacher

In Bronfenbrenner's (2005b), Bioecological Model a student's school environment and the interpersonal relationships between students and others in that environment would be considered microsystems. The proximal processes, or interactions between a student and these microsystems would contribute to and sustain their development over time (Bronfenbrenner, 2005b). A teacher is an adult with whom a student has a sustained relationship over the course of the school year. Compared to any other adult in a school, the amount of time a student spends with a teacher and the number of interactions between a teacher and a student is far greater. Thus, the interactions between teacher and student should, according to Bronfenbrenner (2005b), impact the development of the student.

The relationship between teacher and student has been studied both in terms of its impact on students' academic achievement and engagement in learning activities (Allen et al., 2013; Back, Polk, Keys, & McMahon, 2016; Martin, 2014; Reyes, Brackett, Rivers, White, & Salovey, 2012; Roorda, Roomen, Split, & Oort, 2011). Interestingly, while one could claim in very general terms that a positive teacher-student relationship is associated with more desirable

outcomes in terms of both student achievement and student engagement, the magnitude of the impact varies by student age, student background, and by the personalized nature of the relationship as will be discussed in greater depth.

A meta-analysis conducted by Roorda, Roomen, Split, and Oort (2011) concluded students are impacted by teacher-student relationships in different ways at different ages. While they found positive associations between good teacher-student relationships and student engagement and achievement, they also found the magnitude of the impact differed depending on the age of the student. According to Roorda, Roomen, Split, and Oort in 2011, “the results for grade level suggests that teacher-student relationships are more important for the academic adjustment of older children” (p. 517). For example, the association between teacher-student relationships and academic achievement were stronger in studies that used grades as an indicator of that achievement. The associations between test scores and teacher-student relationships was significant, but smaller. As grades are more widely used among secondary students, the conclusion is that positive teacher-student relationships are more important for older students, particularly in classrooms where grades are an indicator of academic achievement (Roorda, Roomen, Split, & Oort, 2011; Roorda, Jak, Zee, Oort, & Koomen, 2017).

The degree of personalization of the teacher-student relationship has also been examined in terms of its impact on student achievement and engagement. Martin (2014) concluded that the teacher-student relationship was most impactful in terms of motivation and engagement at the student level, rather than the class level. This argument is built on the premise that the relationship between teacher and student varies most at the student level, as opposed to the class level. In a study with over 3,400 high school students, Martin (2014) concluded that positive, personalized relationships with teachers predicted greater motivation, engagement, and positive

self-esteem, whereas negative teacher-student relationships predicted higher student absenteeism. However, establishing a positive classroom climate, through the practice of high-quality interpersonal interactions, has also been shown to positively impact students' academic achievement and engagement in learning activities (Reyes et al., 2012). Rather than looking at positive teacher-student relationships at the individual level, they considered overall classroom climate as indicated by the quality of social and emotional interactions in the classroom. In classrooms with positive classroom emotional climate, teachers were consistently warm, caring, empathetic, and sensitive to student needs. They found students performed better academically in classrooms where this warm, respectful, and emotionally supportive environment was established.

In summary, accumulating evidence suggests that when teachers create a sense of community, respond to student needs, and foster positive relationships – all of which are indicative of classrooms with high classroom emotional climate – academic success likely ensues, perhaps because students are more engaged and enthusiastic about learning. (Reyes, et al., p. 701)

Their conclusions mirror those of Back, Polk, Keys and McMahon (2016) who found positive classroom climates built on strengths-based management, promoting positive relationships through teacher respect for students, also had a significant, positive association with greater academic achievement. Further, Allen et al., (2013) found positive classroom climate, as indicated by warmth, a sense of connectedness, and teacher responsiveness to student need, was predictive of higher student achievement on end-of-year assessments regardless of prior student achievement, demographic characteristics, and class size among secondary students. Taken together, the conclusion that can be drawn from these studies is that relationships between

teachers and students, whether highly personalized and individualized or positive as part of the general classroom climate, are impactful in positive ways on the engagement and achievement of students.

While positive teacher-student relationships have been shown to have positive impacts on students, there may be a group of students for which negative teacher-student relationships is disproportionately impactful in a negative way. Roorda, Roomen, Split, and Oort (2011) found at-risk students are more strongly influenced by the quality of a teacher-student relationship, particularly if it is negative. They conclude that negative teacher-student relationships are more deteriorating for academically at-risk students who already face learning difficulties. And while Martin (2014) argues that perfect teacher-student relationships are not necessary, students who struggle may require different characteristics in their relationships with teachers than students who do not struggle.

Instead, for most students, there will be a need for a positive, functional, working relationship with the teacher – and for some (e.g., those with additional needs) the relationship may need to be somewhat closer to ensure individual needs are better met.
(p. 17)

Taken in sum, the importance of the teacher-student relationship as a part of a student's microsystem cannot be understated. As such, according to Bronfenbrenner (2005b) the impact of this microsystem on a student's development is significant. Interactions that are positive in nature have been shown to positively impact a student's engagement and achievement, while those that are negative in nature are particularly harmful for students who are academically at risk. However, it is not only the relationship between teacher and student that is significant in the

school environment microsystem. Relationships between students and their peers/friends are also a significant part of a student's school environment.

Relationships Between Students and Peers

Another significant component of a student's microsystem according to Bronfenbrenner's (2005b) Bioecological Model would be a student's peers. Interactions with peers make up a significant part of a student's day while at school and, as such, would contribute to a student's development as an individual (Bronfenbrenner, 2005b). In fact, Song, Bong, Lee, and Kim (2015) suggest that social connections with persons outside one's immediate family appear to become stronger during adolescence. Thus, these relationships between students and their peers would appear to be a significant part of a student's microsystem (Bronfenbrenner, 2005b).

Peer relationships among students have been examined to determine their impact on both student engagement and academic achievement (Furrer, Skinner, & Pitzer, 2014; Lynch, Lerner, & Leventhal, 2012; Martin, 2014; Mikami, Ruzek, Hafen, Gregory, & Allen, 2017; Price, 2014, Song, Bong, Lee, & Kim, 2015). Martin (2014) found positive, significant associations between peer relationships and peer interactions and higher academic performance. Martin (2014) found positive peer-to-peer relationships held benefits for overall academic functioning for students, in areas such as motivation and classroom engagement. Further, Martin (2014) found positive interactions with peers in a classroom resulted in higher self-reported motivation for learning and higher academic performance as measured by classroom assessments and grades. Mikami et al. (2017) looked specifically at peer relatedness with classroom peers in middle and high school students. Relatedness, showing mutual respect for peers, caring about peers and feeling cared for, and inclusion as a valued member of a peer group, was hypothesized to increase engagement and achievement if it was positive within a classroom (Mikami et al., 2017). As predicted, in

classrooms where peer relatedness was positive, students reported higher behavioral engagement which in turn predicted higher end-of-year achievement objective tests, even after controlling for prior year achievement (Mikami et al., 2017). Price (2014) also showed those students with a greater number of school-based friendships had higher grade point averages than students with fewer school-based friendships. Price (2014) further concluded those students who were positively associated with school-based activity groups reported higher grades and aspirations to attend college compared to students with no school-based activity group associations. Finally, Furrer, Skinner, and Pitzer (2014) found students with low-quality relationships – those who experienced rejection – had less academic motivation and lower academic performance than students who had high-quality peer relationships. According to Furrer, Skinner, and Pitzer in 2014, “children who experience lower-quality relationships with their peers – who are rejected or socially isolated – are more likely to become disaffected from school and drop out” (p. 102).

Even when examined from a school culture perspective, versus an individual perspective, positive relationships have been linked to greater individual academic achievement. Lynch, Lerner, and Leventhal (2012) examined academic achievement of approximately 1,700 sixth grade students and found individual student achievement was higher in schools with more positive culture.

While multiple studies have been described which link positive peer relationships to improved academic achievement for students, Song, Bong, Lee, and Kim (2015) did not find evidence showing a direct prediction between peer support and academic achievement. Rather, they found significant correlations between positive peer relationships and behaviors that are generally associate with positive academic outcomes. According to Song, Bong, Lee, and Kim (2015) “adolescents with supportive peer relationships tend to demonstrate better adjustment and

adaptive motivation in academic contexts” (p. 835). Further, they found that adolescents who perceived stronger peer support also reported lower test anxiety and stronger association with mastery learning goals.

While student achievement has been examined relative to peer relationships, the relationship between student engagement and peer relationships has also been studied. Lynch, Lerner, and Leventhal (2014) found friendship quality was positively associated with school engagement in students. “Friendship quality, a measure of relational peer culture, was related significantly and positively to school engagement suggesting that attending a school with high levels of friendship quality predicts school engagement the following year” (Lynch, Lerner, & Leventhal, 2014, p. 14). Mikami et al. (2017) confirmed these results at the classroom level by concluding higher levels of peer relatedness in classrooms significantly predicted higher levels of student engagement, even when controlling for prior engagement.

A student’s relationships with their peers can impact both their engagement and academic achievement. As such, the impact of peers on a student’s development as part of their microsystem is significant (Bronfenbrenner, 2005b). In addition to the relationships between students and teachers and students and their peers, another significant interaction students have at school is with other adults not directly involved in classroom instruction. It is those relationships that will now be examined.

Relationships Between Students and Another Adult at School

In Bronfenbrenner’s (2005b) Bioecological Model of Human Development, the school environment would be considered a microsystem, influencing the development of a child. Within the school, students spend time in classrooms as well as in other spaces and configurations such as the cafeteria, library, sports and performing arts venues, halls, and other common areas. The

opportunity to connect with adults in the school who are not directly involved in a student's classroom instruction present themselves as students spend time in school locations that are not classrooms. As Dutton Tillery, Varjas, Roach, Kuperminc, and Meyers (2013) point out, relationships with non-parental adults may be more important for adolescents than for younger students. Thus, examining a student's perceived relationship with at least one adult in a school is valuable for the purposes of this study.

Positive relationships with non-parental adults has been linked to a variety of positive social and academic outcomes for adolescent students (Beck-Cross & Cooper, 2015; Brown & Rodriguez, 2009; Dutton Tillery et al., 2013; McClure, Yonezawa, & Jones, 2010). Using data from the Iowa Youth Survey of over 9,900 eleventh grade male students, Beck-Cross and Cooper (2015) found "youths who identified as having at least one adult (who may or may not be a teacher) at school who could be approached for help with a problem were significantly less likely to demonstrate suicidal behaviors" (p. 236). In addition, Dutton Tillery et al. (2013) found students with positive, non-parental adult connections at school also had higher academic motivation and school belonging, even if they also had factors that would place them at-risk for dropping out of school.

Dutton Tillery et al. (2013) and Brown and Rodriguez (2009) each found a lack of positive adult-relationships to be a contributor to the gradual disengagement from school on the part of students. In their qualitative study of high school dropouts Angel and Ramon, Brown and Rodriguez (2009) found "both Angel and Ramon experienced a culture of weak accountability for students in school, in which there were no structures in place to ensure that *some* adult took responsibility for their academic and personal well-being" (p. 238). This neglect of Angel and Ramon's educational needs, as characterized by a lack of care and accountability on the part of

adults at school with whom Angel and Ramon frequently interacted, was cited by each as a factor contributing to their ultimate decision to drop out of school (Brown & Rodriguez, 2009). As Dutton Tillery et al. (2013) point out “with few adult connections, students lack a significant source of social capital, which may increase the risk of school failure” (p. 141). Dutton Tillery et al. further postulate:

Adolescent students at-risk for school failure (e.g., low socioeconomic status, ethnic minorities, poor school achievement, high absenteeism, and/or identified as having a disability) may benefit most from supportive adult connections. Strong relationships with adults may supply these students with important tools for navigating school. (p. 147)

Positive relationships with adults has been linked to improved student achievement outcomes. In their study of high school students, McClure, Yonezawa, and Jones (2010) found a positive correlation between personalization and two academic outcomes: grade point average and English/Language Arts scale scores on standardized tests. In their study, personalization was measured via a self-reported survey in which three of four survey questions used to create the personalization construct variable asked students questions about their connectedness with an adult at school (McClure, Yonezawa, & Jones, 2010). “Simply stated, the more that students felt personalization at their schools, the better students did academically” (McClure, Yonezawa, & Jones, 2010, p. 10).

Relationships and interactions with others in a school setting make up a significant part of a student’s microsystem (Bronfenbrenner, 2005b). Though interactions between students and teachers, students and peers, and students and other adults in the school are important in a student’s overall engagement and achievement, the mindset a student holds with respect to effort,

failure, intelligence, and hope for the future will now be considered as each relates to student achievement.

Mindset

Mindset is a system of beliefs about one's abilities that has grown out of research involving implicit theories of intelligence and, as such, is an important component of a student's microsystem within Bronfenbrenner's (2005b) Bioecological Model of Human Development. Mindset as a microsystem influences the way a student interacts with other components within their microsystem at school, potentially influencing their overall achievement (Bronfenbrenner, 2005b). Mindset beliefs vary from fixed to malleable in terms of whether one's characteristics are inherited and innate to whether one's characteristics can grow and change with effort and learning (Dweck, 2000; Dweck, 2006). These two contrasting implicit theories of intelligence are referred to as entity and incremental theory respectively. In an academic context, entity theorists are likely to view personal success or failure as a direct result of their innate intelligence. They are focused more on performance versus learning are often referred to as having a fixed mindset. Conversely, incremental theorists will likely associate academic success or failure as a result of their effort or strategy, are more likely to focus on mastery of learning objectives versus performance, and are understood to have a growth mindset (Dweck, 2000; Dweck, 2006; Dweck, Chiu & Hong, 1995; Grant & Dweck, 2003; Yeager & Dweck, 2012).

Though only two mindsets are explicitly defined, individuals often express a combination of the two mindsets in different contexts, with respect to different personal characteristics (Dweck, 2008; Dweck, Chiu & Hong, 1995; Stump, Husman, Chung & Done, 2009). For example, a student may display a fixed mindset in response to their performance in mathematics, while concurrently displaying a growth mindset in response to performance in another subject

area. Likewise, students can also display two different mindsets in reference to two different skill sets. For example, Atwood (2010) showed middle school students were significantly more likely to display characteristics of a growth mindset in reference to sports or athletic skills than they were in reference to intelligence.

In addition to academic or physical achievement, a student's mindset can also influence behavioral characteristics of students. Diseth, Meland, and Breidablik (2014) showed a positive correlation between fixed mindset and lower self-esteem and lower self-efficacy in sixth and eighth grade students. Further, Chan (2012) showed that among Chinese gifted students in grades five through 12, those considered to be unhealthy perfectionists were significantly more likely to hold a fixed mindset with respect to their academic abilities. A growth mindset can also affect the mental toughness of an individual across academic, athletic, and employment contexts as measured by fear of failure, stress, performance, creativity, and resilience (Gucciardi, Jackson, Hodge, Anthony, & Brooke, 2014). Individuals who display a growth mindset significantly differed from those individuals displaying a fixed mindset across all of the listed measures in these three contexts.

Mindset: Views on Effort

In numerous studies, the degree to which persons are motivated to complete a task or learn new material and the amount of effort they dedicate to these tasks has been studied in light of the mindset to which they subscribe. Across a variety of contexts and in a variety of age groups, people who identify with a growth mindset are more likely to demonstrate higher motivation and increased effort. For example, Yan, Thai, and Bjork (2014) found in a study of 450 adults in Amazon's Mechanical Turk program those with a growth mindset were more intrinsically motivated than adults who indicated a fixed mindset. Similarly, Rickert, Meras, and

Witkow (2014) found in a study involving ninth grade students those who held a growth mindset indicated higher levels of effort and study time on days with higher levels of perceived academic demands. These students also expressed higher motivation regarding material to be learned at school than their classmates who held a fixed mindset of intelligence. A growth mindset with respect to effort seems to result in more sustained motivation to complete a task or learn new material than a fixed mindset.

In both of the previous studies, the mindset of individuals was measured at a particular point in time. No data were collected on how or if the mindsets of the participants had changed over time and the resulting impact on their self-reported motivation and effort. In their qualitative study, Howard and Whitaker (2011) interviewed newly successful mathematics students who had previously experienced great difficulty in learning mathematical content. They found that a shift to a growth mindset represented a turning point in students' journey to becoming successful. According to Howard and Whitaker (2011) "when they moved into the growth mindset, students were motivated to be proactive in their learning, feeling they could succeed" (p. 12). The increased motivation students felt as a result of believing effort would help them learn mathematics content resulted in students experiencing success. The increased successes students experienced then sustained the increased motivation to learn even more. Students reported feeling they had more power over their own learning and reported increased time and effort in learning the content (Howard & Whitaker, 2011). The feelings of power or control over one's own learning are consistent with a growth mindset in that a characteristic of a growth mindset is the belief that intelligence can be changed or improved with effort (Dweck, 2006). However, the impact of mindset reaches beyond effort and motivation and also impacts the way in which students approach learning.

Mindset: Natural Ability

While views on effort refers to how one considers and attributes success to the amount of effort exhibited, views on natural ability refers to how one considers the impact of inherited or innate natural abilities on personal success. As confirmed by Dweck (2000, 2006), entity theorists, or those who hold a fixed mindset are more likely to correlate personal success or failure to innate intelligence. Rather than consider the impact of personal effort on success, those with a fixed mindset value the perception of inherited natural abilities as a means to success. Those holding a growth mindset would be more likely to downplay the impact of natural ability on personal success, valuing effort over ability as a way to achieve goals.

It is possible for students to have different views on natural ability when considering multiple aspects of personal performance. For example, a student may view the impact of natural ability on academic performance differently than the impact of natural ability on athletic performance as shown by Atwood (2010). In this example, middle school students were significantly more likely to display characteristics of a growth mindset, which favor effort over natural ability, than they were a fixed mindset with respect to athletic skills. In contrast, these same students were more likely to display a fixed mindset with respect to natural ability in academic performance.

Mindset: Views on Failure

Not only can mindset influence how one approaches learning, mindset has also been shown to influence how one responds to failure. Generally, there are two extreme responses to failure: persistence until an obstacle is overcome or an immediate refusal to do anything more because the failure cannot be overcome. An individual's response to failure may fall anywhere on that continuum and may be dependent on the context in which the failure occurred. For

example, Atwood (2010) found adolescent students are more likely to respond to failure with increased effort and persistence in the context of athletics than in academics. He concludes the characteristics of athletic programs that emphasize practice, effort, and coaching for improvement are more likely to promote the idea of athletic ability as a trait that can be improved and changed. In this context, this growth mindset of athletic ability correlates to increased effort in the face of failure.

In the academic context, one's mindset also translates into different responses to failure depending on the view of mindset one holds. Dweck et al. (1995), found students' who held a fixed mindset were more likely to blame failure on their lack of intellectual ability, whereas those holding a growth mindset were more likely to blame a lack of effort or the use of ineffective strategies for personal failures. In approaching new situations, the students who held a fixed mindset were more likely to employ negative self-judgments and display a lack of persistence, while those with a growth mindset focused on increasing their effort and selecting new strategies. This lack of persistence in response to failure is also supported by the work of Sideridis and Kaplan (2011). In their study involving undergraduate psychology students they found those who were motivated by mastering learning objectives or content persisted longer than those students who were more concerned with individual performance when attempting to solve various puzzles.

Another response to failure that seems to be common among those holding a fixed mindset is the use of self-handicapping behaviors. For example, Rickert et al. (2014) examined responses to failure in ninth grade students. They found those students who held a fixed mindset expressed more self-handicapping behaviors such as procrastination, creation of obstacles to externalize sources of their failure, and less exertion of effort than those students who held a

growth mindset. In another study Snyder, Malin, Dent, and Linnenbrink-Garcia (2014) examined self-handicapping in gifted students. They found that entity-focused messages about giftedness following a failure experience increased the degree of self-handicapping behavior in gifted undergraduate students.

The impact of mindset on one's behavior has been demonstrated in the context of student motivation and effort, selection of strategies and approaches to learning, and students' responses to failure. However, mindset has also been shown to impact students' achievement in various contexts as well. For the purposes of this study, it is the impact of a student's mindset on their academic achievement, as it relates to their level of risk, that is most applicable.

Mindset: Views on Intelligence

Depending on one's mindset, there are two contrasting views regarding personal intelligence that one is likely to have. First, those with an entity theory of intelligence or fixed mindset are likely to view intelligence as something one is born with: an innate characteristic that is not likely to change. Conversely, those with an incremental theory of intelligence or growth mindset are likely to view intelligence as something that can change and grow with increased effort and persistence in learning (Dweck, 2000; Dweck, 2006; Dweck & Leggett, 1988).

As these theories regarding intelligence have been further explored, confirmation of these views of intelligence have been experimentally confirmed across multiple settings. For example, in Dweck and Leggett's studies (1988) using experimentally manipulated theories of intelligence in school-age children, those children who were oriented toward fixed perception of ability chose tasks that would enable them to experience success and positive judgements of their competence. In contrast, those children who were oriented toward a malleable or incremental theory of

intelligence chose task that were challenging and then persisted to mastery. For children in the latter situation, learning was the ultimate goal, even when faced with a difficult task for which success would take time and considerable effort. Further, Dweck and Leggett (1988) confirmed that the results of these studies in which a child's theory of intelligence was manipulated resulted in the same findings as studies where a child's theory of intelligence was simply measured without manipulation prior to a task.

Interestingly, a student's theory of intelligence also has an impact on their general school performance with respect to both the grades they earn and the types of classes they choose to take. Blackwell, Trzesniewski, and Dweck (2007) followed 373 students from their transition to seventh grade through completion of eighth grade for the purpose of determining the impact of a student's mindset on their success in junior high. What they found is that students who held a growth mindset and viewed intelligence as a malleable trait valued learning and demonstrated higher resilience to set backs than those students who held a fixed mindset and viewed intelligence as an innate characteristic. Further, a growth mindset predicted a trajectory of increasing grades during the two years of junior high school, while a fixed mindset predicted a flat trajectory. In another study of middle school students, Romero, Master, Paunesku, Dweck, and Gross (2014) found students with a growth mindset earned higher grades and enrolled in more advanced and challenging mathematics classes than their peers who held a fixed mindset. These results could be attributed to the beliefs those with a growth mindset hold about the impact of effort and persistence on their ability to learn something, thereby increasing their intelligence (Dweck, 2010; Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999).

The impact of one's mindset on performance has also been considered outside of the traditional school setting. Plaks and Chasteen (2013), examined the phenomena of mindset

among older adults. In looking at adults aged 60 to 80, these researchers found better performance on a free recall task designed to measure memory among those who believed in an incremental theory of intelligence. These results were confirmed in situations when an adult's preexisting theory was measured and when their beliefs were manipulated by reading an article about intelligence theories and mindset prior to the task. The similarity of outcomes of the studies conducted by Plaks and Chasteen to the multiple studies conducted in a school setting adds credibility to the argument that mindset is an important factor in learning and performance in both formal educational settings and settings outside of the school.

Though the effect of one's mindset on their view of intelligence has been explained in a dichotomous way, one's mindset is likely to be on a continuum and context-specific (Dweck, 2008; Dweck, Chiu & Hong, 1995; Stump, Husman, Chung & Done, 2009). A student could lean toward a growth mindset in one subject and have more of a fixed mindset in another. However, because mindset has been shown to impact academic success, being aware of students' mindsets, particularly in populations of students which have already been shown to have barriers to success, could be helpful in identifying ways to help students be successful.

Hope for the Future

Gallup (2017) defines hope as the ideas and energy students have for the future. Each year hundreds of thousands of students in grades five through twelve take the Gallup Student Poll, which is designed to measure students' hope, engagement, entrepreneurial aspiration and financial/career literacy. In 2016, over 900,000 students took the poll. Results indicated that while 71% of fifth grade students strongly agreed with the assessment item regarding their excitement for the future, only 44% of eleventh grade students strongly agreed with this statement (Gallup, 2017). Further, students who were hopeful as indicated by their responses to

Gallup questions were 4.1 times more likely to be engaged in school as those students whose responses indicated they were discouraged rather than hopeful. Demographically, hope was highest among Asian and white students (Gallup, 2017). While these results are only available to public and private schools which administered the Gallup Student Poll to their students, a wide-reaching survey of school superintendents conducted by Gallup in 2016 also had some significant conclusions regarding the importance of hope. Of the 1,733 United States' public schools' superintendents who participated in Gallup's survey, 85% of them indicated students' hope for the future as very important in measuring the success of their schools (Gallup, 2016). Taken together, these results indicate that while hope is important, students tend to lose hope during their journey from fifth through twelfth grades.

Hope has been empirically linked to academic achievement in primary and secondary school students as well as undergraduate and graduate students (Feldman, Davidson, & Margalit, 2015; Gallagher, Marques, & Lopez, 2017; Marques, Gallagher, & Lopez, 2017). Specifically, Gallagher, Marques, and Lopez (2017) found hope to be the most robust predictor of academic achievement in college after controlling for a student's prior educational history. The factors of academic achievement they considered were the total number of semesters a student was enrolled, whether a first-year college student returned for their second semester, the likelihood of graduating within four years, and student grade point average throughout college. Their work confirmed that of Snyder et al. (2002). The previous study by Snyder et al. (2002) found that hope better predicted overall grade point average and graduation in college students even after controlling for entrance exam scores. Additionally, in their study of 129 undergraduate students over three years, Day, Hanson, Maltby, Proctor, and Wood (2010) also found hope to be a

stronger predictor of academic performance than general intelligence, personality, and previous academic achievement.

The positive association of hope with academic performance extends to students in grades kindergarten through twelve as well. In fact, in a meta-analysis of 45 primary studies involving over 9,000 students, Marques, Gallagher, and Lopez (2017) found this positive association between hope and academic performance to be stronger for K-12 students than for undergraduate or graduate students. Additionally, Marques, Lopez, Fontaine, Coimbra, and Mitchell (2015) found in a study of adolescents, that those students whose self-reported responses to questions regarding hope placed them in the upper 10% of their peer group had significantly higher results on multiple measures of school success and life satisfaction. They found the following:

Results from this study indicate that students with the highest levels of hope also reported significantly higher mean scores on all measures of school (i.e., school engagement, AA [academic achievement]) and intrapersonal functioning (i.e., life satisfaction, self-worth, mental health) than students reporting average and extremely low levels of hope. (p. 331)

While these studies show hope to be important for academic achievement, hope has also been linked to reduced anxiety and overall well-being in students. Kaya, Bodura, and Yalniz (2013) confirmed that those high school students with high hope for the future also showed significantly lower levels of anxiety and higher self-reported well-being than their peers with low hope. Thus, hope appears to be a significant factor in not only perceptions of student success and satisfaction, but also with tangible academic results.

Though one could think hope is the result of a student's circumstances and not something that can be improved without a change in those circumstances, there are data to suggest hope can

be improved with interventions in a school setting. Interventions designed to improve hope in students have also shown to improve academic achievement in students. In a study of undergraduate students, Feldman, Davidson, and Margalit (2015) found students who had received a hope intervention had higher grades during the semester immediately following the intervention than those who had not received the intervention. This is despite no statistical significance between the two groups' grade point averages prior to the intervention. Further, as this study was done with a cohort, students took the same classes each semester, eliminating the likelihood that the difference in grades was due to variation in classes.

Summary

The review of the literature with respect to variables in this study and how they relate to the conceptual framework provides background information on student engagement, relationships with others, mindset, and risk factors. Specifically, cognitive and behavioral engagement, relationships with peers and adults, and aspects of mindset including beliefs about effort and intelligence, views on intelligence and failure, and hope for the future were discussed. There has been significant research done on all of these topics in various configurations, but there is a lack of research connecting these variables as they relate to the level of risk for students. The purpose of this study is to determine if there is any statistical difference in these variables for the level of risk associated with students and if these variables are predictive in determining the level of risk for students, as well as add to the body of existing literature.

CHAPTER 3

METHODOLOGY

A study of the demographics, mindset characteristics, relationships, and engagement of at-risk and not at-risk students is important in considering how best to meet the needs of the students so that they may be successful. The purpose of this study was to examine the relationship between these variables in the level of risk in students. Further, this study sought to determine if there is a statistically significant predictive relationship between these variables and the level of risk in students.

This chapter provides detailed information regarding the research design. Topics discussed include: description of the research questions considered; methodology, including data collection; discussion of the environmental factors of the study such as setting, study participants, and survey instrument; an examination of the study variables; and data analysis procedures that were used. Limitations and delimitations of the study will also be discussed.

Research Design

This study utilized a quantitative approach to data collection and analysis. Data were collected using a survey and analyzed within a postpositivistic theoretical perspective. According to Crotty (2012), postpositivism is a form of positivism but with marked differences. Postpositivism “is one that talks of probability rather than absolute certainty, claims a certain level of objectivity rather than absolute objectivity, and seeks to approximate truth rather than aspiring to grasp it in its totality or essence” (p. 29). Likewise, Creswell (2014) notes that an aim of postpositivistic research is to explain relationships among variables in the development of testable questions or hypotheses. An examination of students’ views on mindset, engagement, hope for the future, and relationships at school in the context of their academic achievement and

at-risk status looked for relationships among variables rather than absolute certainty. These relationships are described in terms of correlation and probability rather than absolute certainty as no two at-risk students are alike in terms of what places them at risk and how they view the factors being studied. Through the lens of postpositivism, relationships between these variables are explained.

Methodological Approach

Survey research was the methodological approach for this study. Surveys are a way to collect data in postpositivist research. As stated by Fowler, Jr. (2009) “surveys are designed to provide statistics about a target population” (p. 11). According to Fowler (2009) there are two fundamental premises to surveys in the research process. The first is that a survey describes characteristics of the sampled population through the answers given by those individuals responding to the survey. The second is that by describing the characteristics of respondents, a survey can be used to describe the entire target population. In this way, survey research can be used to collect data from a sample and generalize results to an entire population. Babbie (2013) describes three purposes for social research: to explain, to describe, or to explore. Descriptive research seeks to answer what, where, when, or how questions regarding a topic. Explanatory research seeks to answer questions regarding why a phenomenon is the way it is. Exploratory research is used to satisfy the curiosity of the researcher or in situations necessitating further study once a phenomenon is uncovered in the research process.

For the purpose of this study, the research questions lent themselves to descriptive and explanatory purposes using survey methodology. As a means of description, a survey instrument was used to determine the characteristics of mindset and engagement of at-risk and not at-risk students. Data analysis determined if there was a statistically significant difference between these

variables in at-risk students and not at-risk students. As a means of explanation, the survey administration and corresponding data analysis sought to examine the relationship between the independent variables of demographics, engagement in school, mindset characteristics of students, and hope for the future to determine the predictive value of these variables for determining students' level of risk.

Crotty (2014) describes survey research as a way to provide “numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” (p. 13). As such, surveys are a relatively easy way provide quantifiable, objective data generalizable to a population if appropriate sampling methods are used. In this study, data collection was conducted through an online survey, given to students during school hours. The use of an online survey is an easy, fast, and cost-effective way to collect data. Further, as the Internet is part of everyday life for most people in developed countries, the quality of data collected via online surveys is not significantly different than survey data obtained from more traditional and time-consuming methods (Denscombe, 2014). While surveys provide a relatively fast and easy way to collect information from a population sample, there are limitations to the use of surveys. Due to the logistics of administering this particular survey, response rate of participants is not likely to be of concern as the survey was administered during the school day in a classroom setting. However, issues of bias could still be a limitation for this survey. According to Trochim, Donnelly, and Arora (2016), bias can be present in questions asked, sampling methods, and background knowledge of participants. In addition, social desirability or the desire to look good in the eyes of others, can also manifest in participants' responses. To the extent possible in the scope of this research, efforts have been made to address potential bias. However, bias remains a limitation of this study.

Research Questions

The following questions guided this quantitative research study:

1. What are the demographics of the participants in this data set?
2. To what extent is there a statistically significant difference between at-risk and not at-risk participants based on a) demographics (gender and age), b) engagement (behavioral and cognitive), c) relationships (peer, teacher, and adult), and d) mindset (intelligence, hope, effort, views on failure)?
3. To what extent do mindset, effort, engagement, relationships, and hope predict the level of risk for a student?

Sample and Participants

Participants in this study were ninth, tenth, and eleventh grade students from a suburban high school located in the central United States. An email invitation explaining the study (Appendix A) and an electronic consent form (Appendix B), approved by Drake University's Institutional Review Board, were sent to all parents of ninth, tenth, and eleventh grade students prior to survey administration. The school distributed an electronic assent form (Appendix C) to all ninth, tenth, and eleventh grade students. Those students who completed the electronic assent form completed a survey electronically through Qualtrics survey software via classroom laptops and personal devices.

At the close of the survey window, there were 570 responses. Of these 570 submitted responses, 239 had missing student identification numbers. The student identification number is how the researcher matched students to demographic and at-risk factors, so those with missing student identification numbers were removed from the data set. Of the remaining 331 responses, 12 were missing standardized assessment information, grades, and attendance data as they were

not in attendance in the school district during the previous year. These 12 were also removed from the data set. The resulting final data set included 319 cases. Table 3.1 provides demographics of participants.

Table 3.1

Frequency Distribution for Participant Demographics (n = 319)

Variables	<i>n</i>	% of sample
Age		
13	1	.3
14	94	29.5
15	93	29.2
16	81	25.4
17	45	14.1
18	5	1.6
Gender		
Male	143	44.8
Female	176	55.2
Free/Reduced Price Lunch		
Not Free/Reduced	237	74.3
Free/Reduced	82	25.7
Risk Status		
Not At-risk	223	69.9
At-risk	96	30.1

Survey Instrument

The survey instrument (Appendix D) was developed using a compilation of survey questions from freely available surveys as well as questions created by the researcher informed by theory and research on the specific topics. The survey instrument consisted of four sections: Demographics (3 questions), Student Engagement (12 questions), Relationships (3 questions), and Characteristics of Mindset (4 subsections, 21 questions).

Student demographic information collected on the survey instrument was limited to gender and age. Students reported their student identification number, which allowed the student responses to be matched with additional demographic characteristics provided by the school district's student information system. The additional demographic characteristic were matched prior to data analysis is at-risk status. Further, students' standardized test scores were identified by using the student identification number provided by the student.

The second part of the survey consisted of 12 questions regarding student engagement in school. The first seven questions addressed characteristics of behavioral engagement. Statements in this part of the survey were adapted from the Consortium on Chicago School Research/Academic Engagement Scale (CCSR/AES) (Luppescu et al., 2007) and the School Engagement Scale/Questionnaire (SEQ) (Lippman & Rivers, 2008). The second five questions addressed characteristics of cognitive engagement. Statements in this part of the survey were adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot, 1990) and the Student Engagement Instrument (SEI) (Appleton, Christenson, Dongjin, & Reschly, 2006). Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 = "Strongly Disagree;" 2 = "Disagree;" 3 = "Agree;" 4 = "Strongly Agree."

The third part of the survey consisted of three questions regarding the quality of relationships between students and their peers, teachers, and other adults in the school. Each question asked participants to rate their level of agreement using a Likert scale choosing from 1 = "Strongly Disagree;" 2 = "Disagree;" 3 = "Agree;" 4 = "Strongly Agree."

The fourth part of the survey consisted of four subsections regarding characteristics of mindset including beliefs about intelligence, effort, views on failure and hope. Each subsection

in this part included statements asking the participant to rate their level of agreement with each statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Survey questions in these subsections were adapted from Dweck’s (2015) Theories of Intelligence Scale, Academic Hope Form (Shegefti & Samani, 2011), and Franklin’s (2016) unpublished dissertation.

Data Collection

Permission from the suburban school district’s superintendent was obtained to conduct research in the district he leads. Surveys were distributed to students electronically, and completed during class time. The survey took approximately 10 minutes to complete. Qualtrics online software was used to collect data. The data collection period lasted approximately one week, at which point the survey was closed. As the survey was administered at the school during a normal school day, students did receive reminder notifications to complete the survey.

Variables

This study aimed to examine the relationship between demographic characteristics, student engagement in school, relationships, and characteristics of mindset between at-risk and not at-risk students. Further, this study aimed to examine the predictive relationship between student engagement in school, characteristics of mindset, and relationships on the level of risk in high school students. In this study, the independent variables with respect to the students were student engagement, characteristics of mindset, relationships, and demographic information of gender and age. The dependent variable was the level of risk for high school students.

Bronfenbrenner’s (2005) bioecological model served as the framework for data collection and analysis of variables in this study. Independent variables of demographics, student engagement, relationships, and characteristics of mindset were examined as predictors of

students' level of risk using hierarchical multiple regression. Survey results compared at-risk and not at-risk students in terms of their beliefs about student engagement, relationships, and characteristics of mindset.

Independent Variables

The following section briefly describe the independent variables considered in this study.

Student Identification Number. Participants self-identified their unique six-digit number provided to them by the school system.

Age. The current age of each participant was recorded as a continuous variable.

Gender. The sex of each participant was measured through self-identification. Answers were recoded as a dichotomous variable with 0 = male and 1 = female.

At-risk status. Independent characteristics related to the at-risk status of a student included excessive absenteeism, low or failing grades, and underachievement on standardized assessments. Students exhibiting one or more of these variables are considered at-risk for dropping out of school. At-risk status was recorded as a dichotomous variable, with 0 = not at-risk and 1 = at-risk.

Relationships: Peer. Relationships between students and their peers was measured using the following survey question: "I have good relationships with other students in my school." Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = "Strongly Disagree;" 2 = "Disagree;" 3 = "Agree;" 4 = "Strongly Agree." Higher scores indicated a perception of positive relationships with other students.

Relationships: Teacher. Relationships between students and their teachers were measured using the following survey question: "My teachers care about me." Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 =

“Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated the perception that teachers care about their students, and a perception on the part of students of positive relationships with teachers.

Relationships: Another Adult in the School. Relationships between students and at least one adult in the school were measured using the following question: “I have a positive relationship with at least one adult in my school.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated the presence of a positive relationship between the students and at least one adult in the school.

Fixed Mindset: Natural Ability. A student’s mindset with respect to natural ability was measured using the following question: “Natural ability is more important than effort if you want to do well in school.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated a fixed mindset with respect to natural ability.

Growth Mindset: Effort. A student’s mindset with respect to effort was measured using the following question: “The harder I work at something, the better I will be at it.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated a growth mindset with respect to effort.

Engagement: Paying Attention in Class. The extent to which students are engaged in learning by paying attention in class was measured using the following question: “I pay attention in my classes.” Participants were asked to rate their level of agreement with this statement using

a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated a student felt they pay attention in their classes.

Hope: Education and Opportunities. The extent to which students are hopeful with respect to their education creating opportunities for the future was measured using the following question: “My education will create many opportunities for me.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” High scores indicated a belief that a student’s education will create opportunities for them in the future.

Hope: Graduation from High School. The extent to which students believe they will graduate from high school was measured using the following question: “I know I will graduate from high school.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated a belief that one will graduate from high school.

Hope: School and Future Goals. The extent to which students feel school is important in their ability to achieve future goals was measured using the following question: “School is important for achieving my future goals.” Participants were asked to rate their level of agreement with this statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated a belief that school is important for achieving future goals.

Factored Constructs of Independent Variables

The independent variables of student engagement, relationships, and characteristics of mindset were measured using survey questions. Each statement on the survey was measured using the same four point Likert scale where 1 = “Strongly Disagree;” 2 = “Disagree;” 3 =

“Agree;” 4 = “Strongly Agree.” Exploratory factor analysis was used to develop each variable as an independent construct variable. Tabachnick and Fidell (2007) state the goal of exploratory factor analysis is to group together variables that are correlated for the purpose of describing and summarizing data. In doing so, these correlated variables can be considered a single factor. According to Kaiser’s rule, factors with an eigenvalue of greater than one were retained (Mertler & Vannatta, 2013).

In the analysis of the data, a principle component with a varimax rotation approach was used for the factor analysis. A conservative approach of a .44 factor loading was used for acceptance of a specific item into the factor (Vogt & Johnson, 2011). A Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) value of above .50 must be met by each construct (Tabachnick & Fiddell, 2007). The following constructs were explored through exploratory factor analysis.

Student engagement: Behavioral and cognitive. Survey questions were asked of students to determine their level of behavioral and cognitive engagement in school. Participants were given seven statements such as “I work hard to do my best in class,” “I check my school work for mistakes,” “Sometimes I get so interested in schoolwork that I don’t want to stop,” and “I pay attention in class” in order to measure *behavioral* engagement in school. Participants were given five statements such as “I am always try to understand what the teacher is saying, even if it doesn’t immediately make sense,” “When doing schoolwork, it is important that I understand what I am doing in order to learn the material,” and “I am interested in TV shows, books, or articles about the things we are learning in school” in order to measure *cognitive* engagement in school. Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly

Agree.” Higher scores indicated a greater level of either behavioral or cognitive engagement in school. Tables 3.2 provides the items and factor loadings for the behavioral student engagement constructs and cognitive student engagement constructs respectively. Five survey items loaded onto one factor for behavioral engagement and five survey items loaded onto one factor for cognitive engagement.

Table 3.2

Factor Analysis for Behavioral & Cognitive Student Engagement Constructs

Item	Factor Loadings
Behavioral Engagement: Attentiveness to Classwork ($\alpha = .745$)	
I pay attention in my classes	.788
I work hard to do my best in class	.761
I check my school work for mistakes	.727
The topics we are studying in my classes are interesting and challenging	.661
Sometimes I get so interested in my schoolwork that I don't want to stop	.606
Cognitive Engagement ($\alpha = .704$)	
The tests in my classes do a good job of measuring what I know or am able to do	.773
I always try to understand what the teacher is saying, even if it doesn't immediately make sense	.705
Most of what is important to know I learn in school	.691
When doing schoolwork, it is important that I understand what I am doing in order to learn the material	.635
I am interested in TV shows, books, or articles about the things we are learning in school	.596

Mindset: Views on Effort. Survey questions were asked of students to determine their beliefs about effort in school. Participants were given five statements: “Natural ability is more important than effort if you want to do well in school,” “I can do well on any assignment if I try hard enough,” “The harder I work at something, the better I will be at it,” “The harder I work at something the better I will be at it,” “Truly smart people do not need to try hard to be successful,” and” Everyone has something they can improve if they try hard enough.”

Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.”

Exploratory factor analysis showed two factors differentiating between a growth and fixed mindset with respect to effort. Higher scores on survey items loading onto the factor describing a growth mindset indicated responses that support valuing effort as a way to achieve success.

Higher scores on survey items loading onto the factor describing a fixed mindset indicated responses that support a belief that natural ability corresponds to greater success. Table 3.3 provides the items and factor loadings for the beliefs about effort constructs.

Table 3.3

Factor Analysis for Mindset: Beliefs about Effort Constructs

Item	Factor Loadings
Growth Mindset: Beliefs About Effort ($\alpha = .787$)	
The harder I work at something, the better I will be at it	.855
Everyone has something they can improve if they try hard enough	.845
I can do well on any assignment if I try hard enough	.778
I can find many ways to address a problem	.608
Fixed Mindset: Natural Ability ($\alpha = .650$)	
Natural ability is more important than effort if you want to do well in school	.843
Truly smart people do not need to try hard to be successful	.811

Mindset: Views on failure. Survey questions were asked of students to determine their views on failure. Participants were given five statements: “If I don’t learn something quickly, I feel like I’m not smart,” “If I make mistakes, I feel unhappy with myself as a person,” “If I don’t do well on a test, I feel like I’m not smart,” “If I don’t learn something quickly, I give up,” and “It is important to me that my teacher thinks I am good at my school work.” Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 =

“Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores on the survey indicated responses that support a fixed mindset with respect to failure and self-esteem.

Table 3.4 provides the items and factor loadings for the views on failure construct.

Table 3.4

Factor Analysis for Fixed Mindset: Views on Failure Construct

Item	Factor Loadings
Fixed Mindset: Views on Failure ($\alpha = .810$)	
If I don't do well on a test, I feel like I'm not smart	.889
If I don't learn something quickly, I feel like I'm not smart	.860
If I make mistakes, I feel unhappy with myself as a person	.825
If I don't learn something quickly, I give up	.538

Mindset: Beliefs about intelligence. Survey questions were asked of students to determine their beliefs about intelligence. Participants were given five statements: “Being smart is something you are born with,” “You can learn new things, but you cannot really change your basic intelligence,” “There are some things people just can't learn,” “If you don't learn something quickly, you are not smart,” and “If you work hard you can change your level of intelligence.” Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated responses that support an incremental theory of intelligence, which corresponds to a fixed mindset. Table 3.5 provides the items and factor loadings for the beliefs about intelligence construct.

Table 3.5

Factor Analysis for Fixed Mindset: Beliefs about Intelligence Construct

Item	Factor Loadings
Fixed Mindset: Beliefs about Intelligence ($\alpha = .698$)	
Being smart is something you are born with	.758
If you don't learn something quickly, you are not smart	.746
You can learn new things, but you cannot really change your basic intelligence	.724
There are some things people just can't learn	.647

Mindset: Hope for the future. Survey questions were asked of students to determine their hope for the future. Participants were given six statements including: “I know I will graduate from high school,” “My education will create many opportunities for me,” and “I can think of many ways to get good grades.” Participants were asked to rate their level of agreement with each statement using a Likert scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” Higher scores indicated responses that support a growth mindset with respect to hope for the future. Table 3.6 provides the items and factor loadings for the views on failure construct.

Table 3.6

Factor Analysis Mindset: Hope for the Future Construct

Item	Factor Loadings
Mindset: Hope for the Future ($\alpha = .829$)	
My education will create many opportunities for me	.826
I know I will get a good job after I graduate	.779
School is important for achieving my future goals	.768
I can think of many ways to get good grades	.758
I know I will graduate from high school	.746

Dependent Variable

The dependent variable for this study was level of risk. Participants' level of risk was ascertained using the factors of underachievement on standardized tests in reading and/or mathematics, low or failing grades, and excessive absenteeism. Using the student identification number, the researcher coded each student as having zero, one, two, or three at-risk factors.

Table 3.7 provides the descriptive statistics for the dependent variable of level of risk.

Table 3.7

Frequency Distribution for Level of Risk (n = 319)

Variables	<i>n</i>	% of sample
Level of Risk		
No Risk Factors	223	69.9
One Risk Factor	58	18.2
Two Risk Factors	38	11.9
Three Risk Factors	0	0.0

Summary of Independent and Dependent Variables

Table 3.8 provides a summary of the independent and dependent variables and how each was measured.

Table 3.8

Summary of Independent and Dependent Variables with Measurement Type

Variable	Type	Type of Measurement
Gender (1 = female)	IV	Dichotomous
Age	IV	Continuous
Behavioral Engagement Construct	IV	Continuous construct based on factor analysis
Behavioral Engagement for Regression	IV	Ordinal
Cognitive Engagement Construct	IV	Continuous construct based on factor analysis
Relationships: Peer	IV	Ordinal
Relationships: Teacher	IV	Ordinal
Relationships: Other Adult	IV	Ordinal
Growth Mindset: Beliefs about Effort	IV	Continuous construct based on factor analysis
Growth Mindset: Effort for Regression	IV	Ordinal
Fixed Mindset: Natural Ability	IV	Continuous construct based on factor analysis
Fixed Mindset: Natural Ability for Regression	IV	Ordinal
Fixed Mindset: Views on Failure	IV	Continuous construct based on factor analysis
Fixed Mindset: Views on Intelligence	IV	Continuous construct based on factor analysis
Growth Mindset: Hope for the Future Construct	IV	Continuous construct based on factor analysis
Hope: Educational Opportunities for Regression	IV	Ordinal
Hope: Graduation from High School for Regression	IV	Ordinal
Hope: Achieving Future Goals for Regression	IV	Ordinal
At-risk status (1 = at-risk)	DV	Recoded to Dichotomous
Number of at-risk factors	DV	Ordinal

Data Analysis Procedures

Research questions for this study were addressed through descriptive and inferential data analysis.

Descriptive Statistical Analysis

The SPSS v. 20 software program was used to identify the mean, standard deviation, and frequency for each independent and dependent variable identified in Table 3.8. These descriptive statistics were used to address the first research question: What are the demographics of the participants in this data set? Data normality was ascertained through an analysis of skew and kurtosis.

Inferential Statistical Analyses

Inferential statistical analysis procedures were used to determine the likeliness of relationships described in the research questions.

Chi-square Analysis. A chi-square analysis was conducted to answer an aspect of the second research question: To what extent is there a statistically significant difference in at-risk status based on gender?

Independent samples *t*-test. An independent samples *t*-test was conducted to answer the second research question: To what extent is there a statistically significant difference between at-risk participants and not at-risk participants based on a) demographics, b) measures of engagement, c) relationships with teachers, d) relationships with peers, e) relationships with other adult in school, and f) characteristics of mindset? Specifically, the independent samples *t*-test addressed the following questions:

- a) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on age?

- b) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on measures of engagement?
- c) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on relationships with teachers?
- d) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on relationships with peers?
- e) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on relationships with other adults in school?
- f) To what extent is there a statistically significant difference between at-risk students and not at-risk students based on measures of characteristics of mindset?

Correlations. Because data for both independent and dependent variables represent interval measures, a Pearson correlation (r) was conducted to measure the relationship between the variables (Mertler and Vannatta, 2013). “The stronger the relationship, the higher the degree of predictability between X and Y” (Mertler and Vannatta, 2013, p. 164). In this example, X and Y refer to the independent and dependent variables respectively. Variables used in the correlation calculation were: student gender, student age, student at-risk status, behavioral student engagement: attentiveness construct, engagement: paying attention in class, cognitive student engagement, relationships: peer, relationships: teacher, relationships: other adult, growth mindset: effort construct, growth mindset: effort for regression, fixed mindset: natural ability construct, fixed mindset: natural ability for regression, fixed mindset: views on failure, fixed mindset: beliefs about intelligence, growth mindset: hope for the future construct, hope: educational opportunities, hope: graduation from high school, hope: achievement of future goals, and level of risk. A correlation matrix was developed for all variables to ensure multicollinearity

is not a concern for regression analysis. Multicollinearity is a concern because this would indicate two variables contain the same information, which limits the researcher's ability to determine the importance of a specific variable (Mertler and Vannatta, 2013). To avoid the risk of a Type I error in determining statistical significance when computing multiple correlations, the Bonferonni approach will be used to determine the new level for statistical significance. The Bonferonni approach involves dividing a generally accepted alpha level of .05 by the number of correlations calculated (Mertler and Vannatta, 2013).

Hierarchical multiple regression. Research question three was addressed through hierarchical multiple regression in order to determine the influence of the independent variables on the dependent variable addressed in each question. In selecting a hierarchical multiple regression model, the researcher hoped to examine the influence of characteristics of mindset and engagement, relationships, and students' hope for the future on the dependent variable in the specific order listed. According to Mertler and Vanatta (2013), hierarchical multiple regression is used when a research wants look at the influence of independent variables in a certain order.

The equation for multiple regression is:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_KX_K + e$$

In this equation, Y = the predicted outcome of the dependent variable, β_0 = the Y-intercept, β_1, β_2 , etc. = the regression coefficients for each independent variable, X_1, X_2 , etc. = the raw score value on each independent (predictor) variable, and e = the difference between the actual value and the predicted value for the dependent variable (also known as unit error).

The minimum sample size for participants in a multiple regression is related to the number of independent variables being studied. Green (as cited in Wilson VanVoorhis and Morgan, 2007), suggests the following formula to determine the minimum sample size:

$$N > 50 + 8m$$

In Green's equation, N = the minimum number of participants and m = the number of independent variables. The maximum number of independent variables that was used in this regression model for this study was 9. Thus, the minimum acceptable number of participants in this study was 122.

Regression model blocks. In using the sequential hierarchical regression approach to address research question three, the researcher examined the effect of predictor variables on the dependent variable. A hierarchical approach was chosen to isolate the effect of the characteristics for each block in predicting the dependent variable. Blocks will be developed to control for other variables when examining each predictor variable's impact on students' level of risk.

Three blocks were developed for independent variables. Each block represents a component of Bronfenbrenner's (2005b) Bioecological Model of Human Development as it relates to this study. The first block consisted of individual microsystem variables. Variables included growth mindset with respect to effort, fixed mindset with respect to natural ability, and engagement. The second block in this model consisted of three independent variables measuring the degree of positive relationships between students and teachers, peers, and other adults at school, also representing a microsystem. The third block in the model represented characteristics of student hope. Independent variables included were characteristics of hope regarding the role of education in creating future opportunities, views students have regarding their likelihood of graduating from high school, and achievement of future goals, representing a microsystem.

Figure 3.1 provides a visual representation of the regression model for the level of risk.

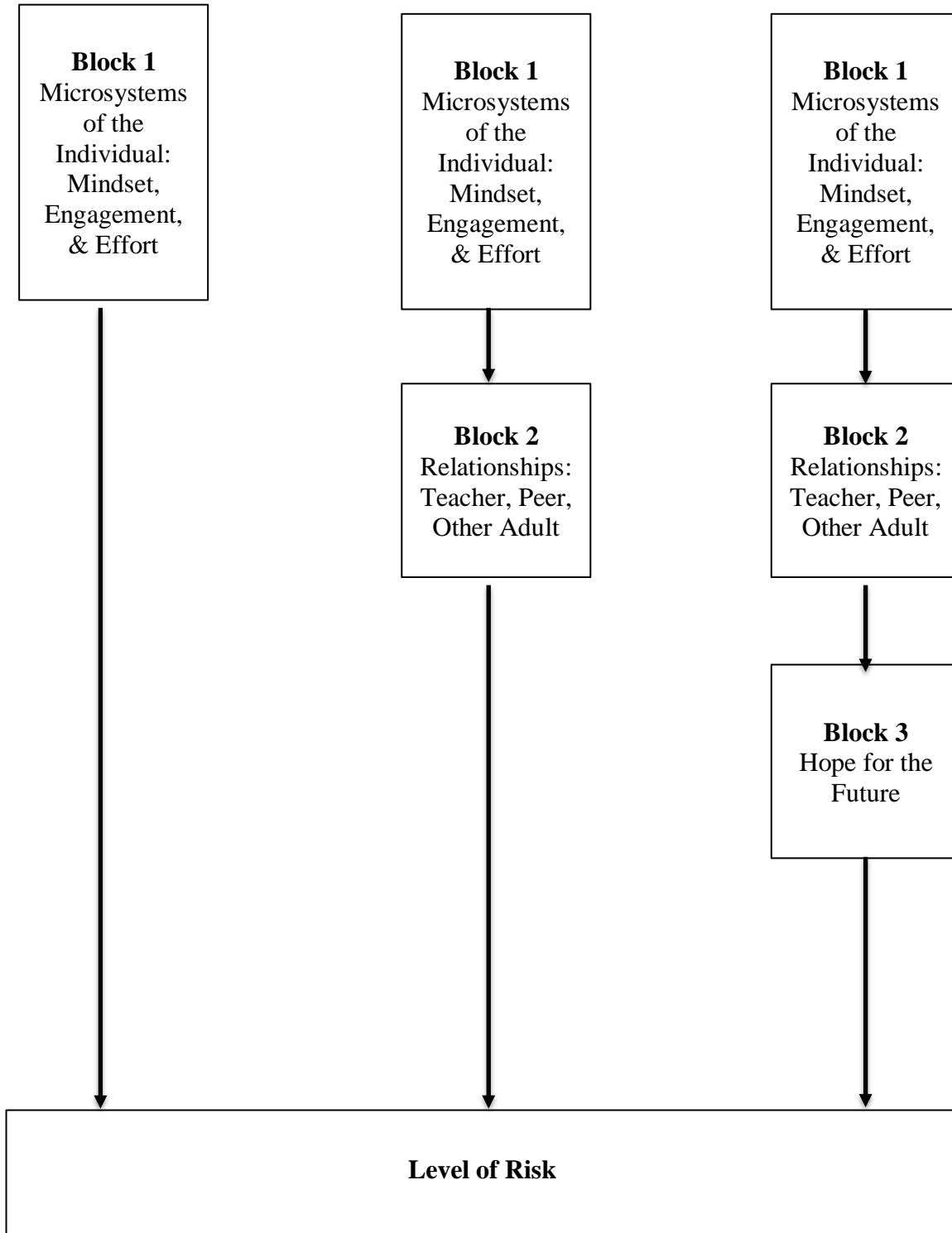


Figure 3.1. Visual Model of Multiple Hierarchical Regression Analyses for Predicting Level of Risk in High School Students.

Delimitations

This study was delimited to ninth, tenth, and eleventh grade public high school students in the central United States. All participants in the study attended the same suburban high school. Results were limited to the specific demographic characteristics of the school site and the participants of the study.

Limitations

There are few limitations to this study. Data were collected at a single point in time, so they are not longitudinal in nature. Thus, it was not possible to examine how a student's mindset potentially changes as they matriculate through high school. Further, a student's at-risk status could also change as he or she advances from one grade to the next. For example, a student not considered at-risk in ninth grade could be considered at-risk in eleventh grade, which could then impact their mindset and/or achievement. Further, as the concept of mindset is gaining in popular professional literature, there is a small chance that some students were exposed to the concept of a growth versus a fixed mindset and have already identified a preference toward one or the other. This may affect survey results. With respect to engagement, the students in this study were asked questions to ascertain their level of engagement in school, not in a particular content area or course. In this way, it was not possible to determine to what extent engagement results reflect a general tendency toward engagement in school versus a content-specific perspective (Fredricks, Blumenfeld, & Paris, 2004).

Summary

This chapter provided the proposed quantitative methodological approach for this study. Sections included review of research design, participants, data collection methods, and survey instrument that were used. A description was provided for all independent and dependent

variables included in the research questions. The process for data analysis was discussed, including both the descriptive and inferential statistical analysis procedures. Finally, delimitations and limitations were discussed.

CHAPTER 4

RESULTS

The purpose of this study was to examine the relationship between independent variables of demographics, characteristics of mindset, behavioral and cognitive engagement, and relationships between students and peers, teachers, and another adult in school in at-risk students and students not at-risk. Further, this study sought to determine if the independent variables listed previously were significantly predictive of level of risk in high school students. This study was informed by Bronfenbrenner's (2005b) Bioecological Model of Human Development, which postulates an individual's development is the result of interactions between that person and components of their environment. The hypothesis for this study, therefore, was that individual microsystems and microsystems outside of the individual significantly impact the level of risk of high school students.

This chapter describes the results of the data analyses and addresses the previously identified research questions. This chapter is divided into seven sections. The first section describes the methods used to screen data and confirm assumptions of normality. Second, descriptive statistics for each variable used in analysis are provided, answering the first research question. The third section answers a component of research question two using chi-square analysis. The fourth section reports the results of independent samples *t*-tests, which answers the remainder of research question two. Correlation analyses for variables used in the hierarchical multiple regression are reported in the fifth section. The sixth section reports the results of hierarchical multiple regression analysis used to answer research question three. Finally, the seventh section provides a summary of results for research questions.

Data Screening and Assumptions of Normality

Screening of data for missing values was conducted prior to completing analysis related to inferential and descriptive statistics. Results of the data screening indicated that of the 331 responses collected, a maximum of seven missing responses to any one question was found, which correlates to 2.1% of total responses to those items. Rubin (1976) categorizes missing data in multiple ways. One of those ways, missing completely at random (MCAR) apply to missing data in this survey. For the survey, the order of questions was randomized prior to the creation of question blocks. Question blocks were created to keep Likert choices visible to the participant at all times, whether on a computer or mobile device. There were no apparent patterns to missing data as they applied to individual cases. Rubin (1976) explains that MCAR data are ignorable. Sterner (2011) points out “ignorable missing data are specifically identified as part of the missing data process and/or are managed by the researcher” (p. 58). Imputation involves calculating the mean response score for the question and using that score for all missing cases for that question. Mean imputation is easy to apply and used when small amounts of missing data exist so that the researcher does not have to delete full or partial responses (Sterner, 2011). Further, as Sterner (2011) concludes, there are no conclusive levels established for missing data as acceptable levels rely on the survey goals and factors unique to the study. The maximum percent of missing responses to survey items in this study was 2.1%, and the average missing data rate was 1.0% across all survey items. After performing mean imputation on missing data, the resulting final data set included 319 cases.

Additional analyses were conducted on these cases to determine if they met assumptions of normality. “Many statistical procedures such as estimation and hypothesis testing have the underlying assumption that the sampled data come from a normal distribution” (Thode, 2002, p.

1000). According to Tabachnick and Fidell (2007), normally distributed data is a necessary prerequisite to many inferential statistics processes, including those conducted as part of this study. To determine the extent of data normality, statistical calculation of skew and kurtosis was conducted. Tabachnick and Fidell (2007) describe skewness as the degree to which data are distributed symmetrically around the mean. A positive skew (>0) indicates a clustering of cases to the left, with few cases in the right tail. A negative skew (<0) indicates a clustering of cases to the right, with few cases in the left tail (Mertler & Vanatta, 2013). They describe kurtosis in terms of the bell curve of the data, focusing on distribution of outliers. If values for kurtosis are positive, this indicates a peaked distribution with long, thin tails. Conversely, if values for kurtosis are negative, this indicates a flat distribution with many cases in the tails (Mertler & Vanatta, 2013). A perfectly normal distribution of data would result in a skewness and kurtosis of zero.

Skewness and kurtosis were analyzed for independent and dependent variables as a way to test for normality. Tabachnik and Fidell (2013) describe kurtosis values of $|3|$ as being acceptable for assuming normality. Two variables had kurtosis values slightly higher than the limit of $|3|$ recommended by Tabachnik and Fidell (2013). Of those, only the variable measuring the extent to which students believe they will graduate from high school was used for regression analysis. The kurtosis value for this variable was 3.923 and skew was -1.749, indicating a slight clustering of cases to the right. Assumptions of normality for other variables were satisfied as values for these variables were within acceptable limits when considering both skewness and kurtosis. The results of analysis for data normality are presented in table 4.1.

Table 4.1

Assessment of Normality for Variables in the Model (n = 319)

Variables	Skew	SE of Skew	Kurtosis	SE of Kurtosis
Gender	-.209	.137	-1.969	.272
Age	.357	.137	-.840	.272
Behavioral Student Engagement: Construct	-.528	.137	1.773	.272
Behavioral Engagement for Regression	-.623	.137	1.664	.272
Cognitive Student Engagement Construct	-.349	.137	1.848	.272
Growth Mindset: Effort Construct	-.767	.137	3.045	.272
Growth Mindset: Effort for Regression	-.720	.137	1.400	.272
Fixed Mindset: Natural Ability Construct	.491	.137	-.068	.272
Fixed Mindset: Natural Ability for Regression	.364	.137	-.288	.272
Fixed Mindset: Views on Failure	.124	.137	-.117	.272
Fixed Mindset: Views on Intelligence	.335	.137	.359	.272
Mindset: Hope for the Future Construct	-.926	.137	2.200	.272
Hope: Educational Opportunities for Regression	-.786	.137	.946	.272
Hope: Graduation from High School for Regression	-1.749	.137	3.923	.272
Hope: Achieving Future Goals for Regression	-.938	.137	1.167	.272
Relationships: Peer	-.766	.137	1.714	.272
Relationships: Teacher	-.526	.137	1.186	.272
Relationships: Other Adult	-.824	.137	1.011	.272
At-risk Status	.872	.137	-1.247	.272
At-risk Level	1.362	.137	.404	.272

Frequency and Descriptive Statistics

Descriptive statistics were calculated for each variable in the study, along with demographic information related to the participants. Table 4.2 reports the results of descriptive analyses for demographic data, including age, gender, and free/reduced lunch status. Descriptive statistics for additional independent and dependent variables are also included in table 4.2. The descriptive statistics that were analyzed and reported include minimum and maximum values, mean value, and standard deviation for each variable.

Table 4.2

Descriptive Statistics for Variables Used in Analysis (n = 319)

Variables	Min	Max	Mean	SD
Age	13	18	15.28	1.09
Gender (0=Male)	0	1	.55	.50
Free/Reduced Lunch (0=Not FRPL)	0	1	.26	.44
Behavioral Student Engagement Construct	5	20	14.27	2.55
Behavioral Student Engagement for Regression	1	4	3.11	.63
Cognitive Student Engagement Construct	5	20	14.27	2.44
Growth Mindset: Effort Construct	4	16	12.99	1.91
Growth Mindset: Effort for Regression	1	4	3.37	.60
Fixed Mindset: Natural Ability Construct	2	8	4.17	1.48
Fixed Mindset: Natural Ability for Regression	1	4	2.18	.81
Fixed Mindset: Views on Failure	4	16	9.78	2.65
Fixed Mindset: Views on Intelligence	4	16	8.85	2.35
Growth Mindset: Hope for the Future	5	20	16.76	2.55
Hope: Educational Opportunities for Regression	1	4	3.25	.69
Hope: Graduation from High School for Regression	1	4	3.66	.55

Table 4.2 (Continued)

Descriptive Statistics for Variables Used in Analysis (n = 319)

Variables	Min	Max	Mean	SD
Hope: Achieving Future Goals for Regression	1	4	3.35	.68
Relationships: Peers	1	4	3.24	.64
Relationships: Teachers	1	4	3.01	.63
Relationships: Other Adult	1	4	3.34	.66
At-Risk Status (1 = at-risk)*	0	1	.30	.46
At-Risk Level ^{a*}	0	2	.42	.70

^aScale: 0 = Not At-Risk, 1 = One At-Risk Factor, 2 = Two At-Risk Factors

*Dependent variable

Chi-Square Analysis

A two-way contingency table analysis was conducted to evaluate the first part of research question two as to whether there was a statistically significant difference in at-risk status based on gender. The two variables were gender with two levels (male and female) and at-risk status with two levels (not at-risk and at-risk). Results indicate that there is not a statistically significant difference in at-risk status based on gender, Pearson $\chi^2 (1, n = 319) = 3.823, p = .051, \Phi = -.109$. The proportion of students at-risk by gender was .531 males and .469 females.

Independent Samples *t*-test

An independent samples *t*-test was conducted to answer the second research question: To what extent was there a statistically significant difference between at-risk participants and not at-risk participants based on a) demographics, b) measures of engagement, c) relationships with teachers, d) relationships with peers, e) relationships with other adult in school, and f) characteristics of mindset? “The independent samples *t*-test is appropriate whenever the researcher wants to know whether two population group means are different and when the

observations in each of the groups are independent of the observations in the other group” (Salkind, 2010, p. 1552). Assumptions of data normality and equal variances must be met, in addition to the assumption that cases represent a random sample from the population and that scores on the test variable are independent of each other (Salkind, 2010). Assumptions of normality and independence of variables were met by data screening procedures and initial data analysis described previously in this chapter and chapter three. Levene’s test for equal variances was used to meet the assumption of variances (Salkind, 2010). Levene’s test for equal variances was significant for the following variables: behavioral engagement, cognitive engagement, effort, natural ability, hope for the future, and relationships with teachers. Thus, equal variances were not assumed, and results of the *t*-test were interpreted accordingly. Equal variances for the following variables were assumed as Levene’s test was not statistically significant: age, views on failure, views on intelligence, relationships with peers, and relationships with another adult in school.

Independent samples *t*-test were conducted to determine to what extent there was a statistically significant difference between at-risk participants and participants not at-risk based on demographics, engagement, relationships, and characteristics of mindset. The independent samples *t*-tests indicated there was no significant difference in at-risk participants and participants not-at risk with respect to age, behavioral engagement, cognitive engagement, fixed mindset: views on failure, and relationships with teachers. The independent samples *t*-test indicated there was a significant difference in growth mindset with respect to effort in at-risk participants and those participants not at risk $t(317) = 2.49, p = .014, d = .35$ indicating that mean scores for growth mindset: views on effort ($M = 13.19, SD = 1.62$) were significantly higher for students not considered at-risk than means scores for growth mindset: views on effort ($M =$

12.52, $SD = 2.42$) for students considered at-risk. The independent samples t -test also indicated there was a significant difference in fixed mindset with respect to natural ability in at-risk participants and those participants not considered at-risk $t(317) = -2.88, p = .005, d = .39$ indicating the mean scores for fixed mindset: natural ability were significantly lower for participants not considered at-risk ($M = 4.00, SD = 1.37$) than for participants considered at-risk ($M = 4.55, SD = 1.63$). An independent samples t -test indicated a significant difference in at-risk participants and participants not considered at-risk with respect to views on intelligence indicative of a fixed mindset $t(317) = -1.99, p = .047, d = .25$ indicating the mean scores for fixed mindset: views on intelligence were significantly lower for participants not considered at-risk ($M = 8.68, SD = 2.22$) than for those participants considered at-risk ($M = 9.25, SD = 2.6$). Results of an independent samples t -test also indicated a significant difference in growth mindset with respect to hope for the future in at-risk students and those students not considered at risk $t(317) = 4.33, p < .001, d = .61$ indicating the mean scores for students not considered at-risk ($M = 17.22, SD = 2.13$) were significantly higher than mean scores for students considered at-risk ($M = 15.72, SD = 3.08$). Independent samples t -tests also indicated significant differences in at-risk students and students not considered at risk with respect to relationships with peers $t(317) = 4.29, p < .001, d = .53$ and relationships other adults in school $t(317) = 3.89, p < .001, d = .47$. These results indicate mean scores for relationships with peers were significantly higher for students not at-risk ($M = 3.34, SD = .54$) than mean scores for at-risk students ($M = 3.01, SD = .775$) and mean scores for relationships with another adult in school were also significantly higher for students not considered at risk ($M = 3.43, SD = .595$) than mean scores for at-risk students ($M = 3.13, SD = .743$). Table 4.3 summarizes the results of the independent samples t -tests.

Table 4.3

Summary of Results for Independent Samples t-tests (n = 319)

	Students Not At-Risk		Students At-Risk		<i>t</i>	<i>df</i>	<i>p</i>	Confidence Intervals	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				Lower	Upper
Age	15.33	1.12	15.17	1.02	1.24	317	.215	-.097	.427
Behavioral Engagement: Attentiveness	14.41	2.23	13.93	3.15	1.37	317	.173	-.215	1.19
Cognitive Engagement	14.33	2.15	14.11	3.02	.64	317	.524	-.456	.890
Growth Mindset: Effort	13.19	1.62	12.52	2.40	2.49	317	.014*	.138	1.206
Fixed Mindset: Natural Ability	4.00	1.37	4.55	1.63	-2.88	317	.005*	-.924	-.171
Fixed Mindset: Views on Failure	9.96	2.64	9.36	2.63	1.86	317	.063	-.033	1.233
Fixed Mindset: Views on Intelligence	8.68	2.22	9.25	2.60	-1.99	317	.047*	-1.130	-.007
Growth Mindset: Hope for the Future	17.22	2.13	15.72	3.08	4.33	317	<.001*	.813	2.180
Relationships: Peers	3.34	.54	3.01	.78	4.29	317	<.001*	.176	.475
Relationships: Teacher	3.04	.58	2.92	.74	1.52	317	.132	-.039	.295
Relationships: Other Adult	3.43	.60	3.13	.74	3.89	317	<.001*	.151	.460

Correlations

Correlation coefficients are calculated to determine the degree to which two sets of measurements are measuring the same information. As Salkind (2010) states “the coefficient of correlation indicates the amount of information common to the two variables” (p. 171). The degree to which two variables contain the same information is measured by the Pearson correlation coefficient (r), and ranges from -1 to 1. A value of zero indicates no correlation

between the two variables, while a value of ± 1.0 indicates the two measures are effectively measuring the same thing (Salkind, 2010). Salkind (2010) indicated relative size of correlation coefficients as weak ($r = .10$), moderate ($r = .30$), and strong ($r = .50$). A value of .9 or higher indicates multicollinearity between two variables so that they are essentially measuring the same thing (Tabachnick & Fidell, 2007). Initially construct variables were going to be used in the hierarchical multiple regression analysis. However, multiple variables approached the .9 value indicating multicollinearity was a concern. Further, in the regression analysis Tolerance (a collinearity statistic) also indicated some multicollinearity between the constructs. Therefore, to avoid multicollinearity, construct variables were eliminated and specific items from each construct were included in the regression analysis.

Pearson correlation coefficients were calculated among each of the variables of risk level, age, gender, behavioral engagement, cognitive engagement, views on effort, views on natural ability, views on failure, views on intelligence, hope for the future, relationships with peers, relationships with teachers, and relationships with another adult in school. This analysis resulted in 45 correlation coefficients represented in Table 4.4. The Bonferroni approach was used to reduce the risk of a Type I error in determining statistical significance when computing multiple correlations. This approach involves dividing a generally accepted alpha level (.05) by the number of correlations ($0.05/45$), which resulted in a new alpha level of .0011. In order to be considered statistically significant, therefore, the p value for a correlation in this analysis must be below .0011. Using this p value as the conservative level of significance, 31 of the 45 correlations were considered significant. Results for all correlations are noted in Table 4.4, and those considered significant according to the computed p value of .0011 are noted with an asterisk (*).

Table 4.4

Correlations for Research Question 3 (n = 319)

	1	2	3	4	5	6	7	8	9
1 Risk Status	--								
2 Fixed Mindset: Natural Ability	.16	--							
3 Growth Mindset: Effort	-.13	-.11	--						
4 Engagement	-.10	.00	.47*	--					
5 Relationships: Peers	-.24*	.09	.40*	.24*	--				
6 Relationships: Teachers	-.11	.11	.41*	.40*	.37*	--			
7 Relationships: Other Adult	-.26*	-.01	.46*	.29*	.34*	.42*	--		
8 Hope: Education & Opportunity	-.17	.00	.50*	.35*	.45*	.44*	.38*	--	
9 Hope: Graduation	-.33*	-.06	.45*	.32*	.34*	.36*	.51*	.47*	--
10 Hope: Future Goals	-.16	.01	.58*	.48*	.41*	.44*	.46*	.51*	.47*

Note: * $p < .0011$ Bonferonni adjustment for multiple correlations to minimize chances of a Type 1 error.

Strong Correlations

As indicated by Salkind (2010), a strong correlation has a value of at least .5. Four strong correlations among variables were seen to exist using the .5 figure. First, students' hope with respect to the view that their education will create opportunities for the future was positively correlated with a growth mindset with respect to effort ($r = .50, p < .0011$), indicating those students who feel their education will create future opportunities also view increased effort as a way to achieve success. Two measures of hope also had strong positive correlations. Hope as measured by a belief that one will graduate from high school was correlated with relationships with another adult in school ($r = .51, p < .0011$), meaning students who hold the belief that they

will graduate also indicated having a positive relationship with an adult at school. Hope as measured by a belief that school is important to achieving future goals was positively correlated to two variables: growth mindset with respect to effort ($r = .58, p < .0011$) and hope with respect to the belief that education will create future opportunities ($r = .51, p < .0011$). This indicates students who believe school is important to achieving their future goals also believe effort is important in achieving success and that their education will create future opportunities for them.

Moderate Correlations

Twenty three correlations were considered moderate based on Salkind's (2010) interpretation of the correlation coefficient. Most of these correlations were positive. However, students' level of risk was negatively correlated to hope with respect to graduation ($r = -.33, p < .0011$), indicating students who had higher levels of risk were less likely to indicate a belief they would graduate from high school. Remaining moderate correlations were positive.

A growth mindset with respect to effort was positively correlated to engagement ($r = .47, p < .0011$), indicating students who believe effort will lead to success are also more likely to be engaged in school. A growth mindset with respect to effort was also correlated to all three measures of relationships. First, students holding a growth mindset with respect to effort are more likely to indicate positive relationships with peers ($r = .40, p < .0011$). A growth mindset with respect to effort was also positively correlated to relationships with teachers ($r = .41, p < .0011$), indicating those who believe effort will lead to success are also likely to have a positive relationship with teachers. Finally, a growth mindset with respect to effort was also correlated with relationships with another adult in school ($r = .46, p < .0011$), indicating students with a growth mindset are likely to indicate a positive relationship with another adult in school.

Student relationships with teachers was correlated to two additional variables. The variable measuring students' relationships with teachers was correlated to engagement ($r = .40$, $p < .0011$), indicating those students who felt they have positive relationships with teachers are also likely to indicate higher levels of engagement in school. Student relationships with teachers was also correlated to student relationships with peers ($r = .37$, $p < .0011$), indicating students who feel they have positive relationships with teachers were more likely to also indicate positive relationships with peers.

The variable measuring student relationships with another adult in school was positively correlated to both of the other variables measuring relationships. First, students who indicated positive relationships with another adult in school were more likely to also indicate positive relationships with teachers ($r = .42$, $p < .0011$). Positive relationships with another adult in school was also correlated to relationships with peers ($r = .34$, $p < .0011$), indicating students who have positive relationships with another adult in school are also more likely to indicate positive relationships with their peers.

Most of the moderate correlations occurred with measures of hope. Hope with respect to the belief that education will create future opportunities was correlated to four variables. First, this measure of hope was correlated to engagement ($r = .35$, $p < .0011$), indicating students who believe their education will create future opportunities were also more likely to indicate they were engaged in school. This measure of hope was also positively correlated to all three measures of relationships. With respect to peers, students who believe their education will create future opportunities for them were also more likely to indicate positive relationships with their peers ($r = .45$, $p < .0011$). Students who were hopeful about their education and future

opportunities were also more likely to indicate positive relationships with both teachers ($r = .44$, $p < .0011$) and another adult in school ($r = .38$, $p < .0011$).

Hope as measured by a belief that one will graduate from high school had moderately positive correlations with five variables. Students who indicated a belief that they will graduate from high school were more likely to indicate a growth mindset with respect to effort ($r = .45$, $p < .0011$). Additionally, a belief that one will graduate from high school was also correlated with engagement ($r = .32$, $p < .0011$), indicating students who believe they will graduate had higher levels of engagement in school. A belief that one will graduate was also correlated to positive relationships with peers ($r = .34$, $p < .0011$) and positive relationships with teachers ($r = .36$, $p < .0011$). Finally, the belief that one will graduate from high school was also positively correlated to a belief that education will create future opportunities as a measure of hope ($r = .47$, $p < .0011$).

The variable that measured hope as indicated by the belief that school is important to achieving future goals was correlated to five other variables. First, students who indicated a belief that school is important to their future were also more likely to indicate higher levels of engagement ($r = .48$, $p < .0011$). Further, students who are hopeful about the role of school in achieving future goals were also more likely to have positive relationships with peers ($r = .41$, $p < .0011$), teachers ($r = .44$, $p < .0011$), or another adult in school ($r = .46$, $p < .0011$). Finally, a belief that school is important in achieving future goals is correlated to a belief in one's likelihood of graduation from high school ($r = .47$, $p < .0011$).

Weak Correlations

Four correlations were considered weak based on Salkind's (2010) interpretation of the correlation coefficient. Students' level of risk was negatively correlated to two variables

measuring relationships. First, students who had higher levels of risk were less likely to indicate positive relationships with peers ($r = -.24, p < .0011$). Further, students with higher levels of risk were also less likely to indicate positive relationships with another adult in school ($r = -.26, p < .0011$). However, relationships with peers and relationships with another adult in school were positively correlated to engagement. Students who indicated positive relationships with peers were more likely to indicate higher levels of engagement ($r = .24, p < .0011$). Additionally, students who indicated positive relationships with another adult in school were also more likely to indicate higher levels of engagement ($r = .29, p < .0011$).

Multicollinearity

Variables used in the hierarchical multiple regression analysis were included in the correlation analysis. Of the 45 correlations included in the correlation analysis, none of the correlation coefficients for these variables was .9 or higher. This value is considered the upper limit of what is acceptable to include variables independently in advanced analyses methods (Tabachnick & Fidell, 2007). However, in the initial analysis of correlations using construct variables, multiple variables approached the .9 value so multicollinearity remained a concern. To avoid multicollinearity, construct variables were eliminated and specific items from each construct were included in the regression analysis.

Hierarchical Multiple Regression Analysis

Hierarchical multiple regression was chosen as the best method to determine the extent to which the independent variables were significant predictors of the dependent variable.

Bronfenbrenner's (2005b) Bioecological Model of Human Development was used to group independent variables into blocks based on their role as part of a student's microsystem. The first block included measures of the individual student microsystem: mindset, effort, and engagement.

The second block added relationships with peers, teachers, and another adult in school, microsystem variables outside of the individual. Finally, the third block added measures of student hope as an individual microsystem. Results of the regression analysis, including information regarding each model used, are reported in the following sections.

A hierarchical multiple regression was conducted to determine to what extent do individual microsystem variables related to school (fixed mindset with respect to natural ability, growth mindset with respect to effort, and engagement in class), relationships (peer, teacher, other adult in school), and characteristics of hope predict level of risk for students. Table 4.5 provides information on the three blocks in which variables were entered into the regression analysis, the unstandardized regression coefficients (b), the standard error for the unstandardized regression coefficients ($SE\ b$), standardized regression coefficients (β), and the variance explained (R^2) for each model.

Individual Microsystem Variables Related to School (model 1)

Block 1 included the variables of fixed mindset with respect to natural ability, growth effort with respect to effort and engagement in class. Results for the regression analysis for block 1 indicated that fixed mindset with respect to natural ability ($\beta = .146, p = .009$) was a significant predictor of a student's level of risk $F(3, 315) = 4.365, p = .005$, accounting for 4% ($R^2 = .040$) of the variance in level of risk. Growth mindset with respect to effort ($\beta = -.092, p = .148$) and engagement in class ($\beta = -.053, p = .402$) were not statistically significant predictors of level of risk.

Relationships (model 2)

The variables of relationships with peers, relationships with teachers, and relationships with another adult in the school were added to the sequential regression in block 2. Results for

the regression analysis with the addition of block 2 indicated a fixed mindset with respect to natural ability ($\beta = .179, p = .001$), positive relationships with peers ($\beta = -.215, p < .001$), and positive relationships with another adult in school ($\beta = -.222, p < .001$) were all significant predictors of level of risk $F(3, 312) = 10.24, p < .001$, accounting for 12.6% ($R^2 = .126$) of the variance in the level of risk.

Hope for the Future (full model)

Three variables designed to measure aspects of students' hope for the future: belief that education will create future opportunities, belief that one will graduate from high school, and belief that school is important for achieving future goals were added to the sequential regression in block 3 creating the full model for the hierarchical multiple regression. Results for the regression analysis with the addition of block 3 indicated a fixed mindset with respect to natural ability ($\beta = .166, p = .002$), positive peer relationships ($\beta = -.190, p = .002$), positive relationships with another adult in school ($\beta = -.137, p = .038$), and a belief that one will graduate from high school ($\beta = -.260, p < .001$) were all significant predictors of level of risk $F(3, 309) = 5.290, p = .001$, accounting for 16.9% ($R^2 = .169$) of variance in students' level of risk. Table 4.5 summarizes information on the three blocks in which variables were entered into the regression analysis, the unstandardized regression coefficients (b), the standard error for the unstandardized regression coefficients ($SE b$), standardized regression coefficients (β), and the variance explained (R^2) for each model.

Table 4.5

Hierarchical Regression Coefficients for Levels of Risk (n = 319), R² = .169

Variable blocks	<i>b</i>	<i>SE b</i>	β
Individual Microsystem Variables Relative to School (block 1)			
Constant	.688	.270	
Fixed Mindset: Ability	.124	.048	.146**
Growth Mindset: Effort	-.106	.073	-.092
Engagement: Attentiveness in Class	-.059	.070	-.053
Relationships (block 2)			
Constant	1.328	.285	
Fixed Mindset: Natural Ability	.153	.046	.179**
Growth Mindset: Effort	.090	.080	.078
Engagement: Attentiveness in Class	-.028	.069	-.025
Relationships: Peers	-.234	.066	-.215***
Relationships: Teachers	.028	.070	.025
Relationships: Another Adult in School	-.235	.066	-.222***
Hope for the Future (block 3)			
Constant	1.815	.305	
Fixed Mindset: Natural Ability	.141	.046	.166**
Growth Mindset: Effort	.135	.083	.117
Engagement: Attentiveness in Class	-.007	.070	-.006
Relationships: Peers	-.206	.067	-.190**
Relationships: Teachers	.044	.070	.040
Relationships: Another Adult in School	-.145	.070	-.137*
Hope: Education & Opportunities	.018	.071	.018
Hope: Belief in Graduation	-.327	.083	-.260***
Hope: School & Future Goals	.006	.076	.006

Note¹. $R^2 = .040$ for block 1; $.126$ for block 2; $.169$ for block 3 – full model

Note². * $p < .05$, ** $p < .01$, *** $p < .001$

Summary Answers to Research Questions

Each of the three research questions is answered in this section using results from the data analyses presented in this chapter.

Research Question 1

What are the demographics of participants in this study?

The sample consisted of 319 participants, ranging in age from 13 to 18 ($M = 15.28$, $SD = 1.091$). The majority of participants (55.2%) identified as female. The majority of students (74.3%) did not qualify for free or reduced price lunch. Further, the majority of students (69.9%) did not have any at-risk factors.

Research Question 2

To what extent is there a statistically significant difference between at-risk participants and participants not considered at-risk based on a) demographics (gender and age), b) engagement (behavioral and cognitive), c) relationships (peer, teacher, and other adult), and d) mindset (views on effort, views on natural ability, views on failure, views on intelligence, and hope for the future)?

Gender. A chi-square analysis revealed no statistically significant difference between at-risk participants and participants not considered at-risk based on gender.

Age. An independent samples t -test indicated no statistically significant difference between at-risk participants and participants not considered at-risk with respect to age.

Behavioral engagement. An independent samples t -test indicated no statistically significant difference between at-risk participants and participants not considered at-risk with respect to level of behavioral engagement.

Cognitive engagement. An independent samples t -test indicated no statistically significant difference between at-risk participants and participants not considered at-risk with respect to level of cognitive engagement.

Growth mindset: Views on effort. An independent samples t -test identified a statistically significant difference in growth mindset with respect to effort between at-risk participants and participants not considered at-risk. Participants not considered at-risk had higher

scores on measures of a growth mindset with respect to effort than participants considered at-risk.

Fixed mindset: Natural ability. An independent samples *t*-test identified a statistically significant difference in fixed mindset with respect to the role of natural ability in achieving success between at-risk participants and participants not considered at-risk. At-risk participants had higher scores on measures of a fixed mindset with respect to the role of natural ability in achieving success than participants not considered at-risk.

Fixed mindset: Views on failure. An independent samples *t*-test indicated no statistically significant difference between at-risk participants and participants not considered at-risk with respect to a fixed mindset view on failure.

Fixed mindset: Views on intelligence. An independent samples *t*-test revealed a statistically significant difference between at-risk participants and participants not considered to be at-risk based on a fixed mindset view of the role of intelligence in achieving success. At-risk participants indicated higher scores on measures of a fixed mindset with respect to intelligence than participants not considered at-risk.

Relationships with peers. An independent samples *t*-test identified a statistically significant difference between at-risk participants and participants not considered at-risk with respect to the perception of positive relationships with peers. Students not considered at-risk indicated having more positive relationships with peers at school than those students considered at-risk.

Relationships with teachers. An independent samples *t*-test indicated no statistically significant difference between at-risk students and students not considered at-risk on a measure of perceived positive relationships with teachers.

Relationships with other adult. An independent samples *t*-test revealed a statistically significant difference between at-risk participants and participants not considered at-risk on a measure of perceived positive relationships with another adult at school. Participants not considered at-risk were more likely to indicate having a positive relationship with at least one other adult at school than at-risk participants.

Research Question 3

To what extent do mindset, effort, engagement, relationships and hope predict the level of risk for a student?

Mindset. Results from the hierarchical multiple regression analysis showed the individual microsystem variable of fixed mindset with respect to natural ability was a significant predictor of students' level of risk. Students who indicated higher levels of a fixed mindset with respect to the role of natural ability in achieving success were more likely to have higher levels of risk. The individual microsystem variable measuring growth mindset with respect to effort was not a statistically significant predictor of risk in students.

Engagement. Results from the hierarchical multiple regression analysis revealed the individual microsystem variable of attentiveness in class as a measure of engagement was not a significant predictor of level of risk in students.

Relationships. Results from the hierarchical multiple regression analysis revealed the microsystem outside of the individual variables of relationships with peers and relationships with another adult were statistically significant predictors of level of risk in students. Students with greater levels of perceived positive relationships with peers and another adult in school were less likely to have high levels of risk. The microsystem variable of relationships with teachers was not a statistically significant predictor of level of risk in students.

Hope. Results from the hierarchical multiple regression analysis revealed the individual microsystem variables of belief that one will graduate from high school as a measure of student hope was a statistically significant predictor of level of risk in students. Students who indicated lower levels of agreement that they believe they will graduate from high school were more likely to have higher levels of risk.

Regression model. Results from the hierarchical multiple regression revealed a fixed mindset with respect to natural ability, a lack of positive relationships with peers, a lack of positive relationships with another adult in school, and the lack of a belief that one will graduate from high school were all statistically significant predictors of level of risk in students, accounting for 16.9% ($R^2 = .169$) of variance in level of risk.

Summary

This chapter provided results from all data analyses procedures described in chapter three. Data analysis revealed assumptions of normality were met. Demographic data for participants were presented. Results of each statistical analysis were provided. The chi-square analysis was not statistically significant, but five of the independent samples *t*-tests were statistically significant. Thirty one of the 45 correlations were statistically significant. Further, four of the nine variables in the hierarchical multiple regression were statistically significant predictors of level of risk in students. Chapter five provides a discussion of the results and recommendations for practice and future research.

CHAPTER 5

DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

This chapter provides a discussion of results presented in chapter four, as informed by the conceptual framework of the study and current literature. A summary of the study is presented, followed by a discussion of the results as they pertain to the conceptual framework. Implications for practice and recommendations for future research are examined before the conclusion is presented.

Summary of the Study

Chapter one provided an overview of various factors of students' development as organized by Bronfenbrenner's (2005b) Bioecological Model of Human Development. The problem of determining who is likely to be at-risk for dropping out of school, as well as using the factors of engagement, relationships, mindset, and hope to predict level of risk, was discussed. Information regarding the purpose of the study, research questions, and significance was also provided. The chapter concluded with a visual representation of the study's variables organized into the components of the conceptual framework and definitions of key terms used in the study.

Chapter two discussed current literature related to the variables used in the study. Beginning the chapter was a review of factors found to place students at-risk for dropping out of school. A specific focus on excessive absences, low or failing grades, and underachievement on standardized tests was presented. A review of literature on the impact of students' behavioral and cognitive engagement in school followed. Next, the impact of positive relationships between students and their teachers, peers, and another adult in school was discussed, as it relates to both academic achievement and engagement in school. Finally, a review of the literature on aspects of

mindset was presented. Student views on effort, natural ability, failure, intelligence, and hope for the future were considered as they relate to engagement in school and academic achievement.

Chapter three discussed the methodology of this study. Discussion of the research design, methodological approach and research questions began the chapter. Next, information regarding the sample and participants was presented. Detailed information on all variables used in the study was then discussed, including information on factor analysis for variables. Descriptive and inferential statistical analysis procedures were presented, including chi-square, independent samples *t*-test, and hierarchical multiple regression. A visual representation of the hierarchical multiple regression model was included. Finally, delimitations and limitations were discussed, concluding the chapter.

Chapter four provided results for analyses conducted in this study. A discussion of data screening and assumptions of normality began the chapter, followed by descriptive statistics. Results of the chi-square analysis, independent samples *t*-test, correlations, and hierarchical multiple regression were provided. Summary answers to the three research questions used in the study concluded the chapter.

This chapter is organized into three sections. The chapter begins with a discussion of results as they relate to independent and dependent variables. Next, implications for practice are presented. Finally, recommendations for future research are presented.

Discussion of Results

The culmination of a pre-kindergarten through grade twelve educational experience for students should result in graduation, and the accompanying credential of a high school diploma. However, according to the National Center for Education Statistics (2018), only 84% of United States high school students earned a diploma within four years of starting ninth grade in 2016.

There are both personal and societal implications for failing to graduate from high school. On a personal level, students who fail to graduate and drop out of school are more likely to be unemployed or underemployed, more likely to experience physical and/or mental health problems, and more likely to experience social exclusion and decreased psychological well-being (Banturina, Berc, & Majdak, 2014). For example, according to the most recent data from the U. S. Bureau of Labor Statistics (2018) those with less than a high school diploma make, on average, approximately \$26,000 less per year than those with a high school diploma. Further, the September, 2018 unemployment rate for those with less than a high school diploma was 5.5% compared to 3.7% for those individuals who have graduated from high school but have no college experience. In investigating high school dropouts Esch et al. (2014) found, “internalizing disorders were also found to be an outcome of secondary school dropout, above all mood disorders and suicidal ideations” (p. 246). On a societal level, students who fail to graduate are less likely to be civically engaged and more likely to participate in government-funded programs, creating a potential financial burden for society (Baturina, Berc, & Majdak, 2014; Theunissen, Ilse, Verdonk, Feron, & Bosma, 2012). Ensuring students graduate from high school has positive implications for all members of society.

Bronfenbrenner (2005b) presents a theory to explain the impact of biology and environmental factors on the development of the individual in his Bioecological Model of Human Development. Multiple factors, ranging from macrosystem to individual microsystems are interacting through proximal processes and influencing a student’s development. Of these, engagement, relationships, characteristics of mindset, and hope for the future were considered for this study. In general, the more students are engaged in school, the more positive their educational outcomes are going to be (Furlong, et al., 2003). Both quality of engagement and

quantity of engagement matter, and higher levels of engagement in each of these ways has positive effects on student learning (Fredricks, Blumenfeld, & Paris, 2004; Gettinger & Walter, 2012; Guthrie, Wigfield, & You, 2012; Janosz, 2012; Rumberger & Rotermund, 2012).

Likewise, the more positive relationships students have with peers, teachers, and another adult in school, the more likely they are to have positive educational outcomes, particularly as they get older (Allen et al, 2013, Beck-Cross & Cooper, 2015; Martin, 2014; Mikami et al., 2017; McClure, Yonezawa, & Jones, 2010; Roorda, Roomen, Split & Oort, 2011).

Students' mindsets are a bit more complex to quantify in general terms. With respect to how a student views the role of effort in his or her success, those students holding a growth mindset are more likely to be successful academically (Howard & Whitaker, 2011). Likewise, a growth mindset with respect to the role of intelligence in achieving success has also been linked to higher academic success in terms of course grades (Blackwell, Trzeniewski, & Dweck, 2007). A student's hope for the future was found to be the most robust predictor of student achievement in college, both in terms of grade point average and likelihood of graduation, even after controlling for prior academic achievement and entrance exam scores (Gallagher, Marques, & Lopez, 2017; Snyder et al., 2002). Students' mindsets regarding their view of the roles of natural ability and failure on success is harder to directly link to achievement. Dweck (2000, 2006) found students with a growth mindset downplayed the role of natural ability on overall success. Likewise, Dweck (1995) found students with a growth mindset see failure as a lack of effort, not a lack of ability. In both of these studies, a direct measure of mindset on students' academic achievements was not included. However, Sideridis and Kaplan (2011) found students with a growth mindset with respect to failure were motivated by mastering objectives (learning) and

more likely to stick with a task until those objectives were mastered, indicating higher achievement.

The goal of this study was to determine predictors of level of risk for students through an examination engagement, relationship, mindset factors and hope. Results show that individual microsystem variables of a fixed mindset with respect to ability, relationships with peers and another adult in school, and a belief that one will graduate from high school were statistically significant predictors of level of risk in students. Each of these independent variables are discussed in detail.

Macrosystem

Two macrosystem variables, gender and age, were examined for this study to determine whether a statistically significant difference exists in the number of males identified at-risk versus the number of females identified at-risk and if there was a statistically significant difference in the at-risk population with respect to age. Though no statistically significant difference for age or gender was found, significance for gender was borderline ($p = .051$), with males making up a higher percentage of at-risk students than females. With respect to gender, multiple studies have shown males typically display more risk factors for dropping out of school than females (Balfanz, Herzog, & Mac Iver, 2007; Bowers, 2010; Bowers, Spratt, & Taff, 2013). For example, in their longitudinal study of approximately 13,000 students from 1996 through 2004, Balfanz, Herzog, and Mac Iver (2007) found “girls are less likely than boys to display each of the warning flags and outgraduate boys by 12 percentage points on average” (p. 234). These warning flags include attendance, course failures, and behavior. Both attendance and course failures were considered as risk factors for the purpose of this study. Bowers (2010) also found males were significantly more likely than females to have the risk factor of low grades.

With respect to age, Bowers (2010) found in a longitudinal study of 193 students from two suburban Midwest school districts that the risk of dropping out began in earnest in grade seven, steadily increased from grades eight through ten, and peaked in grade eleven. The conclusions of Doll, Eslami, and Walters (2013) may have an explanation for this phenomenon. They found so-called pull factors such as external family or work-related responsibilities were more prevalent for students in grades ten through twelve than for younger students. These responsibilities pull on students' time and ability to commit to school, thus contributing to a student's decision to drop out. However, in their analysis of 36 studies of dropout prediction spanning over 30 years, Bowers, Sprott, and Taft (2013) found variability in dropout rates. The variability in dropout rates that they found was largely due to studies that included only higher grades, excluding dropouts from grades where compulsory attendance was still in effect. Excluding these students distorted potential conclusions on the correlation between student age and likelihood of dropping out.

Microsystems

Nine microsystem variables were considered for this study. These variables included fixed mindset with respect to natural ability, growth mindset with respect to effort, attentiveness in class as a measure of engagement, relationships with peers, relationships with teachers, and relationships with another adult in school. Three of the nine variables measured aspects of student hope: consideration of the impact of education on creating future opportunities, belief that one will graduate from high school, and belief that school is important in achieving future goals. Student engagement and mindset variables belong to the individual as a microsystem. Most variables were considered as part of an individual student's microsystem. However, relationships with peers, teacher, and another adult were also considered as microsystem

variables, but these microsystems are outside of the student as an individual. Of the variables considered in this study, four were found to have significantly predict level of risk in students: a fixed mindset with respect to natural ability, a lack of positive relationships with peers, a lack of positive relationships with another adult at school, and a lack of belief that one will graduate from high school.

Fixed mindset with respect to natural ability. Results of this study indicate students' beliefs about mindset with respect to natural ability is a predictive variable with respect to level of risk for students. Mindset with respect to natural ability is a measure of how students perceive the role of natural ability in achieving success. Student mindsets can vary between the two extremes of believing natural ability is solely responsible for any success and believing anything is possible with enough effort. An individual's response could fall anywhere on a continuum between those two extremes, and may vary in different contexts (Atwood, 2010). Those holding a fixed mindset with respect to natural ability are more likely to attribute failure to a lack of innate intellectual ability (Dweck et al., 1995; Sideridis & Kaplan, 2011). Results of this study indicate students who hold a more fixed mindset with respect to how they view natural ability are more likely to experience higher levels of risk than students who hold a more growth mindset in this area. Students who regard natural ability as important to achieving success need strategies and support to connect effort and perseverance in task completion and learning to tangible success like improved grades. In the school environment, teachers need strategies to support and empower students to persist in the face of learning challenges and help explicitly connect these behaviors to increased success for students.

Positive relationships with peers. Results of this study indicate students' relationships with peers is a predictive variable with respect to level of risk for students. Students were asked

to rate their level of agreement, using a Likert scale, with the following prompt: “I have good relationships with other students in my school.” Students reporting higher agreement with this prompt experienced significantly lower levels of risk than students reporting lower levels of agreement.

In the school setting a significant amount of time consists of interactions between students and peers. These interactions would comprise a significant component of a student’s microsystem and, thus, contribute to a student’s development as an individual (Bronfenbrenner, 2005b). Further, as Lee and Kim (2015) suggest, the social connections outside one’s immediate family appear to become stronger during adolescence. Specifically, relationships between peers have been shown to impact both engagement and achievement (Furrer, Skinner, & Pitzer, 2014; Lynch, Lerner, & Leventhal, 2012; Martin, 2014; Mikami et al., 2017; Price, 2014; Song, Bong, Lee, & Kim, 2015). More positive peer relationships result in higher levels of student engagement and higher academic performance as measured by grades and classroom assessments (Martin, 2014). For all students, but particularly for those students who do not perceive positive relationships with peers, a classroom environment which fosters positive interactions among students, mutual respect, and opportunities for students to productively collaborate with one another could be beneficial in improving peer relationships overall and reducing a student’s level of risk.

Positive relationships with another adult at school. Results of this study indicate a positive relationship between a student and another adult at school is a predictive variable with respect to level of risk for students. Students were asked to rate their level of agreement, using a Likert scale, with the following prompt: “I have a positive relationship with at least one adult in

my school.” Students reporting higher agreement with this prompt were found to have significantly lower levels of risk than students reporting a lower level of agreement.

Relationships between students and adults in school would be another microsystem within Bronfenbrenner’s (2005b) Bioecological Model of Human Development . There are multiple opportunities for students to interact with adults who do not directly teach the student in a traditional class setting. For example, in a high school, students navigate halls between classes, visit the cafeteria, library, and other common spaces. They participate in extra-curricular activities which foster interactions with athletic coaches and club sponsors. All of these venues result in interactions between students and adults in the school setting, but outside of the classroom. These relationships between non-parental adults and students is more important for adolescents than for younger children (Dutton Tillery et al., 2013). Positive relationships between students and another adult in school have been linked to both increased engagement in school and greater levels of academic success (Dutton Tillery et al., 2013; McClure, Yonezawa, & Jones, 2010). Further, having a positive relationship with a non-teaching adult in school could also positively impact students' mental health. As Beck-Cross and Cooper (2010) found “youths who identified as having at least one adult (who may or may not be a teacher) at school who could be approached for help with a problem were significantly less likely to demonstrate suicidal behaviors” (p. 236). Considering the frequency with which students encounter other adults throughout their school day, the importance of fostering adults’ skills in building positive relationships cannot be understated. Ensuring all adults are equipped with skills necessary to build positive relationships with adolescents is critical to improving these relationships in schools.

Hope for the future: Belief that one will graduate. Results of this study indicate students' beliefs about mindset with respect to their lack of belief that they will graduate from high school is a predictive variable with respect to level of risk for students. Hope can be defined as the ideas and energy students have for the future (Gallup, 2017). Multiple studies have empirically linked a high sense of hope for the future with both increased levels of student engagement and higher student achievement outcomes (Feldman, Davidson, & Margalit, 2015; Gallagher, Marques, & Lopez, 2017; Marques, Gallagher, & Lopez, 2017). Unfortunately, hopefulness tends to decrease as students get older (Gallup, 2017). Results of this study found a significant link between a student's reported hopefulness as indicated by the lack of a belief that they will graduate from high school and level of risk. Students who were less hopeful as indicated by disagreement with the statement "I know I will graduate from high school" experienced higher levels of risk than peers with higher levels of agreement on the same question. While alarming, there is some research suggesting interventions designed to improve hope can positively impact academic achievement for students at the undergraduate level (Feldman, Davidson, and Margalit, 2015). Considering the significant predictive relationship between hope for the future and level of risk this study found for high school students, strategies for improving hope for adolescents in the school setting could be beneficial in reducing students' level of risk.

Recommendations for Practice

The results of this study indicate a relationship between students' level of risk and student mindset with respect to natural ability, student relationships with peers and another adult in school, and students' belief that they will graduate from high school as a measure of hope. This study is unique in that it investigated relationships between engagement, mindset, hope, and

relationships in terms of predicting level of risk for a student, not simply whether or not a student is considered at-risk. Hammond, Linton, Smink and Drew (2007) identified multiple factors that could put students at-risk for dropping out of school. The more factors that apply to an individual student, the greater the number of obstacles they must overcome to complete high school successfully. Determining how engagement, mindset, hope, and relationships predict level of risk for students allows educational practitioners to determine where interventions designed to offset the negative impact of a fixed mindset and foster improvements in those variables that have been shown to decrease risk level, should be considered to decrease overall level of risk for students. By narrowing the focus for interventions, both teachers and leaders can experience greater levels of efficacy in decreasing students' level of risk for dropping out of school.

Recommendations for School Leaders

Multiple recommendations for practice of school leaders can be derived from this study's findings. As empirically determined by Marzano, Waters, and McNulty (2005) "the leadership behavior of the principal can have a profound effect on student achievement" (p. 31-32). Thus, practices implemented and behaviors displayed by leaders have the potential to either improve or decrease achievement of students. The potential impacts of any practice should be carefully considered by leaders when selecting strategies for implementation in schools they lead.

1. Establish a school culture that fosters positive relationships. The results of this study suggest quality of relationships are significant predictors of level of risk for students. Specifically, the degree to which students perceive positive relationships with peers and the degree to which students perceive positive relationships with another adult at school correspond to lower levels of risk. A school culture which fosters positive relationships could have a significant impact on reducing level of risk for students.

According to Maslowski (2006) “school culture is conceptualized as shared beliefs about how the school should operate, core values reflecting what the school wants for its students, and behavioural norms reflecting teacher perceptions of the school environment” (p. 14). Because culture encompasses the shared beliefs of all persons in the organization, one can conclude that larger organizations pose more significant challenges and are more resistant to changes in culture. High schools are generally the largest of school configurations, consisting of hundreds to thousands of students, dozens of teachers, and often just as many support staff members as teachers. Establishing and nurturing a school culture that fosters positive interactions between students and all adults is challenging and may necessitate creative solutions to delivering and supporting professional learning of adults due to disparity in roles and work schedules, but a worthwhile endeavor to ensure feelings of connectedness by all students.

Ensuring consistency in expectations and common understanding of desired behaviors among all adults in a school is a foundational component to establishing a school culture that fosters positive interactions between students and all adults. There are programmatic ways to establish these common expectations and common understandings. For example, a framework such as Positive Behavior Intervention Supports (PBIS) creates consistency in expectations for students and teachers through the school-based establishment of positively-stated, schoolwide expectations for student behavior. While consistency in expectations is certainly important for students, it is also important that teachers have common understanding of student expectations so consistency in responding to student behavior is ensured. Students who experience different types or intensity of responses by adults to similar behaviors could be more likely to perceive unfair treatment and negative views of adults involved. Another programmatic approach to improving school culture is the Responsive Classroom (RC). RC aims to “enhance teachers’

capacity to create a caring, well-managed classroom environment characterized by respectful social interactions and academically engaging instruction” (Rimm-Kaufman et al., 2014, p. 569).

Both PBIS and RC are proactive approaches, involving upfront learning by adults, along with ongoing monitoring, data analysis, and calibration of understanding by all adults. Whether deploying PBIS, RC, or working to improve culture in some other way, this is a long-term process requiring concerted effort of leadership to effect meaningful change. However, because the results of this study suggest the quality of a student’s relationships significantly predict their level of risk, the potential return on investment is high. Further, in addition to simply improving relationships for students, and thus potentially impacting their level of risk in positive ways, Gaziel (1997) suggests improvements in school culture can also benefit academic achievement for subgroups of students not considered in this study, namely African American, Asian, and economically disadvantaged students. These improved outcomes warrant a serious consideration on the part of school leaders as to the impact of cultural improvements on students.

2. Implement assessment and grading practices that focus on mastery of learning objectives. The results of this study suggest that both student mindset with respect to how they view the impact of natural ability on success and their hope for the future as measured by a belief that they will graduate from high school are significant predictors of level of risk in high school. Traditionally, grades have been used to measure the degree to which students are successful in their learning. Grades have been used to note and communicate student progress and levels of achievement from the earliest Chinese civilizations right up to the present day (Lysne, 2006; Sadler, 2009). However, as Allen (2005) points out grading practices are not standardized and can often vary widely even among teachers in the same school. Considering the widespread use of grades as an interpretation of achievement and the inconsistencies among different teachers

with respect to what is included in the calculation of a student's grade, one could argue this is an equity issue for students.

An empirical link between evaluation and assessment practices and their impact on student self-efficacy has been established, along with the impact of self-efficacy on the amount of effort students are willing to then put into learning (Brookhart, 2013; Brookhart & Peretin, 2002). As Schimmer (2016) states “grading practices must also serve the big idea of establishing, sustaining, and growing student confidence about potential successes” (p. 23). If conclusions by these researchers hold true, improved grading practices that are consistent among all teachers, fair, accurate, specific, and timely could work to positively impact students' self-efficacy and confidence, which then could improve students' investment in effort toward achieving learning objectives and lessen their perception that natural ability predicts the likelihood of success. Snyder (1991) characterized hope as possessing the capacities to set and achieve goals through the use of specific strategies, as well as initiate and maintain motivation for the use of these strategies. If grading practices instill the sense that success is possible, setting and achieving goals becomes more realistic. This improvement in confidence could have a positive impact on students' belief in their ability to successfully complete high school. As Schimmer points out “confidence is about real optimism that develops from a sense that success is possible, even if it's not immediate” (p. 25).

Considering the long-standing traditions and current state of inconsistency with respect to grading practices, improving them will not be an easy or quick process (Allen, 2005; Brookhart, 2013; Sadler, 2009; Yorke, 2011). Considerable professional learning for teachers would be necessary, both in terms of examining philosophical beliefs and practical application of new

behaviors. However, the potential benefits to students are significant, and warrant serious consideration of this strategy as a way to decrease level of risk in high school students.

3. Establish a systemic and systematic multi-tiered system of support (MTSS). The results of this study suggest students who indicated a lack of belief in their ability to successfully complete high school and graduate were more likely to have higher levels of risk. Earning a high school diploma requires the successful completion of a variety of required and elective courses. A lack of belief in the ability to graduate from high school could indicate students are struggling academically to earn these credits and are in need of additional support structures. An MTSS system is a way to systematically identify and support students who are struggling academically.

The traditional high school day for students consists of going to different classes, with different teachers, to learn different subjects. This can occur on a traditional schedule, consisting of six to eight classes that vary in length from approximately 40 to 50 minutes each, or a block schedule, consisting of three to four classes that vary in length from approximately 75 to 90 minutes each. In either of these examples there is rarely time for students to work with classroom teachers outside of their scheduled classes. This is particularly impactful for students who are struggling to learn the concepts being taught. The result is that unless there is significant differentiation and intervention happening within the scheduled class periods by the classroom teacher, students are likely to fall further and further behind. Without a systemic and systematic process for addressing student needs, responsibility often falls solely on the classroom teacher and is often outside of their capacity, as an individual, to support.

An MTSS system has several components. First of all, a data-based framework for decision making must be established, defining data to be collected and analyzed. A thorough problem-solving process is also defined, and a team-based approach for identifying, leading,

planning and evaluating intervention efforts is deployed (Jimerson, Burns, & VanDerHeyden, 2016). These processes define clear steps in addressing student learning needs, as well as other needs such as behavior or attendance. Also defined in the process are the individuals in the system who will support varying aspects of the process. An effective MTSS system would also have clearly communicated timelines to ensure expectations and support are understood by all in the school. Having a robust MTSS process also communicates the desire for teachers to ensure students are successful. Much like the establishment of effective, mastery-focused grading practices, establishing systems and structures to connect students with needed help communicates that learning is the goal. The resulting academic successes could lead to increased student efficacy and belief that graduation from high school is attainable.

Establishing an effective MTSS system requires an upfront investment in the creation of the process, but also an ongoing commitment to following the process. For school leaders, this could require some innovative and strategic thinking. Capturing time in an already regimented school day is challenging. Defining additional roles and responsibilities for team-based work for individuals with varying schedules and commitments is also a significant challenge for an MTSS process. Both of these challenges require significant creative thinking on the part of school leaders. However, a thorough and effective MTSS process has the potential to meet the diverse learning and engagement needs of all students, but particularly those at-risk. With a thorough process it is much less likely that a student could potentially be overlooked when considering how best to support all students.

Recommendations for Teachers

Multiple recommendations for practice of teachers can be derived from this study's findings. Hattie (2009) in his meta-analysis of over 800 meta-analyses, found teacher quality

matters more than other school-based factors in terms of impact on student achievement. The logical implication of this conclusion is that what teachers say and do matters greatly in the lives of students.

1. Develop a personal growth mindset and growth mindset with respect to students.

Results of this study suggest students' mindsets with respect to natural ability are a significant predictor of level of risk. Dweck (2006) postulates that mindset exists along a continuum from fixed to malleable. Further, students can display different mindsets in different contexts (Atwood, 2010; Dweck, 2008; Dweck, Chiu, & Hong, 1995; Stump, Husman, Chuyng, & Doe, 2009). Interestingly, students' mindsets have shown the ability to be influenced experimentally toward a fixed or growth state through a variety of methods such as communication from an authority figure or readings designed to establish a preference for a growth mindset (Donohoe, Topping, & Hannah, 2012; Esparza, Shumow, & Schmidt, 2014; Schroder, Donnellan, Moran, & Moser, 2014; Yeager, Trzesniewski, & Dweck, 2013). Thus, a teacher's ability to recognize where along the continuum a student's mindset currently exists is an important precursor in influencing that student's belief toward a growth mindset. Understanding the research around the impact of growth mindsets and the ability for a teacher to positively influence their students' mindsets is an important consideration for teachers' practice.

The results of this study indicate positive relationships and a belief in one's ability to graduate also significantly impact students' level of risk. Resulting changes needed to professional practice such as improving school culture, changes to grading practices, or establishing a robust MTSS system will likely result in teachers needing to improve their professional skills. While much of the focus on mindset research has centered on students, teachers also need to believe in their personal capacity to learn and improve their skills in

personal and professional ways. Efforts to improve culture in the school or change grading practices will involve examination of personal practices and philosophies on the part of teachers. While some teachers' beliefs may be aligned to philosophical beliefs attached to new efforts to improve culture or grading, others will not. Molden and Dweck (2006) postulate entity theorists would be more likely to respond to these differences, and efforts to change them, with passive or defensive behavior. Particularly when valued abilities as a professional or long-standing identities are directly threatened by change efforts, the way in which entity theorists respond could ultimately hinder their ability to achieve goals of the change. Thus, those with a growth mindset would be more likely to persist through change efforts.

2. Adopt a system-based approach to continuous improvement. Results of this study suggest students' views regarding the role of natural ability in achieving success and the belief that they will graduate from high school are both significant predictors of level of risk. In high school, a student's classroom performance is linked closely to both of these variables. For example, success in a classroom setting is defined by the grade one receives on assessments of learning. Because graduation from high school is dependent on students earning the necessary credits required as determined by grades in courses, the belief that one will graduate also likely depends on success in a classroom setting. In either case, the teacher is the leader of the class, and has the discretion to choose assessment methods and instructional practices as well as the responsibility to create a positive culture for learning.

Classroom teachers are leaders of a system which includes multiple people (students) and processes (instruction and assessment). They are responsible for making many decisions that impact both the students and the processes. According to Lewis (2015), often in improvement efforts "faithful implementation of a program assumes the needed knowledge is 'in' the

intervention” (p. 55). However, this ignores an important sources of knowledge: variation. Variation in both processes of implementation and setting are important sources of knowledge that must be considered by the leader of the system in order to adapt and improve. Attention to variation, and its impact on improvement efforts, requires active and thorough engagement on the part of teachers. As Bryk, Gomez, Grunow, and LeMahieu (2017) state, in a system-based approach “improvement science deploys rapid tests of change to guide the development, revision, and continued fine-tuning of new tools, processes, work roles, and relationships” (p. 8). In this model, fast learning results in immediate refinement of the strategy, rather than blindly following a program only to later learn it was ineffective.

A systems-based approach to quality improvement asks the leader to attend to all parts of the system, and the interactions between the parts. As W. Edwards Deming famously taught “any time the majority of the people behave in a particular way the majority of the time, the people are not the problem. The problem is inherent in the system” (McChesney, Covey, & Huling, 2012, p. 5). Without attention to the whole system, it is too easy to blame failure of improvement efforts on people. When coupled with a focused effort to adopt a growth mindset, learning how to execute quality improvements in a systems-based way could be a powerful method for teachers to impact their students’ level of risk in positive ways by reducing variation, improving teacher effectiveness, and improving student results.

3. Build positive relationships with students. The results of this study suggest relationships students have at school are significant in their ability to predict level of risk for students. Of the three types of relationships considered for this study, relationships students have with peers and relationships they have with other adults in school were both significant. Teachers interact with students both in and out of the classroom setting. Often teachers are also coaches

and extra-curricular activities sponsors. Thus, it is logical to assume teachers are some of the “other adults” with whom students have relationships at school.

A foundational belief in building positive relationships with students is that they need to be treated with dignity. According to Curwin, Mendler, and Mendler (2018), treating students with dignity “increases trust, builds relationships, and makes problems easier to solve” (p. 6). This proactive strategy involves the teacher as the leader of the classroom system setting clear expectations for how students will be treated and modeling the behaviors they want students to exhibit, even when students are not. Curwin, Mendler, and Mendler (2018) state even when students are “rude, nasty, defiant, and disruptive, we are empathetic, compassionate, and caring” (p. 6). Understanding teachers are humans, one can logically conclude that staying calm when students are displaying behaviors contradictory to school or classroom norms is not easy. However, like other recommendations proposed, building positive relationships with students involves discipline and humility on the part of the adults in a school. However, considering the results of this study and the significant impact of relationships on students’ levels of risk, it is a worthwhile pursuit with the potential of a high return on investment in decreasing students’ levels of risk.

Recommendations for Students

1. Adopt a growth mindset. Results of this study indicate student mindset with respect to natural ability and a belief that they will graduate from high school are both significant predictors of level of risk. Students with a propensity for a fixed mindset have higher levels of risk. Likewise, students who indicated a lower belief in their ability to graduate from high school had higher levels of risk. The adoption of a growth mindset could have positive implications for both of these variables.

Multiple studies have shown students who have a growth mindset are more likely to focus on mastery of learning objectives versus simply completing learning tasks (Dweck, 2000; Dweck, 2006; Dweck, Chiu, & Hong, 1995; Grant & Dweck, 2003; Yeager & Dweck, 2012). The adoption of the Common Core State Standards in 2010 outlined common expectations for skills and knowledge students should master in particular grade levels (Council of Chief State School Officers, 2018). Thus, teachers around the country have worked to align class learning objectives to these standards. A focus on mastery of these learning objectives, present in those with a growth mindset, is more likely to ensure students leave their classes with knowledge and skills they need to successfully complete high school. Simply completing individual tasks or associating failure with a lack of natural ability and giving up will not result in mastery of learning objectives and could be associated with higher levels of risk for dropping out of school.

The relationship between a growth mindset and hope is also important to state. According to Conti (2000) hope helps students to approach problems with a focus on success. Like a growth mindset which helps students focus on mastery learning, an approach to problem solving that assumes success could build efficacy in students. Achieving goals and learning could build hope that graduating from high school is possible and reduce the likelihood that students will drop out of school.

Recommendations for Future Research

This study contributes to the existing literature in the areas of mindset, engagement, relationships, hope, and levels of risk for high school students. This study is unique in that rather than simply correlating mindset, engagement, hope, and relationships to whether or not a student is considered at-risk, it examined these variables as predictors for a student's level of risk in high school. This study was able to determine which variables were more likely to predict the number

of risk factors of students, thus determining level of risk. This study used a quantitative methodology and included a survey as a measurement tool to quantify beliefs by students. The survey tool was adapted from various existing surveys, compiling multiple areas of focus (engagement, relationships, and mindset), into one instrument. The data set produced by the measurement tool met assumptions of data normality in this study.

Validation of the Survey Instrument

Validity of the measurement tool with respect to other populations does not exist for the survey instrument as a whole. Future research with additional populations in varied settings is recommended to validate the measurement tool as a way to consider engagement, relationships, hope, and various aspects of mindset together in predicting level of risk for students.

Impact of Independent Variables on Additional Populations

Future research could include different age groups, such as middle school students as risk factors for this population would be the same as for high school students. Additional populations could include urban and/or rural students as this study was limited to students in a suburban high school.

Longitudinal Impact

Longitudinal research could consider whether level of risk changes as students' perceptions of the independent variables of engagement, relationships, and mindset change as they matriculate through school and through school transitions (i.e. middle school to high school).

Additional Risk Factors

The population for this study was predominately Caucasian and not living in poverty as measured by free/reduced price lunch qualification. Though ethnicity and socioeconomic status

were not considered as variables for this study, future research could also consider the impact of these variables as predictors of level of risk.

Effectiveness of Strategies Suggested

Considering the recommendations suggested, future research is also needed to determine the effectiveness of these strategies. For example, as teachers work to develop positive relationships with students, to what extent is the language used with students hopeful? Another area to examine would be the extent to which a growth mindset with respect to hope is present and predictive of level of risk in schools where reformed grading practices, such as those described previously, are present versus schools with more traditional grading practices.

Conclusion

Results of this study show connections between aspects of mindset, relationships, hope, and engagement and level of risk in students. As Bronfenbrenner's (2005b) Bioecological Model of Human Development postulates, these aspects of a students' microsystem interact to impact their overall development. This model was used to organize variables for the study. A survey instrument to measure students' perceptions of these variables was adapted from existing surveys and deployed via an online platform. Statistical analyses were conducted to examine the data and answer the research questions. A hierarchical multiple regression identified students' fixed mindset with respect to natural ability, student relationships with peers, student relationships with other adults in school and belief that one will graduate as significant predictors of level of risk in high school students. Ways the results of this survey can impact educational practice were discussed as were potential directions for future research. Considering the multiple, negative consequences for not finishing high school continued work to improve graduation rates for all students, but particularly those who have one or more risk factors is imperative.

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APPENDIX A

Parent Recruitment Email

Hello,

My name is Crista Carlile, and I am a doctoral student at Drake University. As part of my doctoral dissertation study, I respectfully request your child's participation in a short, ten-minute electronic survey about their learning preferences and beliefs about learning. These data will be used anonymously for the purposes of my study. The purpose of the study is to better understand the relationships between components of student mindset, relationship with others in the school, and academic achievement among students considered at risk and those not considered at risk.

Please see the attached consent form or the paper copy your child brought home that outlines purpose, risks, and confidentiality for this study. If you consent to have your child participate, please sign the attached consent form and have your child sign the assent form. The form must be sent back to school with your child by [date].

If you have any questions regarding this study, please do not hesitate to contact me. Thank you for your help.

Thank you,

Crista Carlile
Doctoral Candidate, Drake University
4124 141st Street
Urbandale, IA 50323
crista.carlile@drake.edu - (515) 371-1595

If you have questions about your rights as a research participant, you may contact the Drake University Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects. The approved IRB protocol number for this study is XXXXXXXX. You may reach the board office at irb@drake.edu or (515) 271-DIRB (ext. 3472).

APPENDIX B

Consent Form

INFORMED CONSENT DOCUMENT

Title of Study: The Impact of Mindset, Relationships, and Engagement on Academic Achievement in At-Risk Students and Students Not At-Risk

Investigators: Crista Carlile, Doctoral Student, Drake University

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

Introduction

The purpose of this study is to investigate the relationship between student engagement, components of mindset, and relationships at school and student achievement in students considered at-risk and students not considered at-risk. Your child is being invited to participate in this study because they are a ninth, tenth, or eleventh grade student at Urbandale High School.

Procedures

If you agree to participate, your child will be asked to complete a brief, online survey, consisting of 36 questions. Each question will ask students to rate their level of agreement to a particular prompt on a scale choosing from 1 = “Strongly Disagree;” 2 = “Disagree;” 3 = “Agree;” 4 = “Strongly Agree.” This study will take approximately ten minutes to complete in one session. Students will complete the survey at school, during their English/Language Arts class.

Risks

While participating in this study students may experience minimal risks. The primary risk to students is discomfort in answering a survey question (i.e., I have good relationships with other students in my school). Your child may choose to skip any question he or she does not feel comfortable answering.

Benefits

If you decide to participate in this study there will be no direct benefit to your child. It is hoped that the information gained in this study will benefit the educational community by understanding further the relationship between student mindset, engagement in school, relationships with others in school and academic achievement in students at-risk and students not considered at-risk.

Participant Rights

Your child’s participation in this study is completely voluntary and he/she may refuse to participate or leave the study at any time. If your child decides to not participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which

your child is otherwise entitled. Your child can skip any questions that he/she does not wish to answer.

Confidentiality

Any information obtained in connection with this research study that can be identified with you will be disclosed only with your permission; your results will be kept confidential. In any written reports or publications, no one will be identified or identifiable and only group data will be presented. However, auditing departments of Drake University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information

To ensure confidentiality to the extent permitted by law, the following measures will be taken: all data will be collected electronically and stored on a password-protected computer. Student numbers will be used to match survey results with standardized test scores and at-risk status. At this point a random number will be assigned to each student to eliminate identifying information from the data. Data will be stored on a password protected computer for approximately three years or until the data are no longer needed for research purposes, at which time the data will be destroyed.

Contacts and Questions

You are encouraged to ask questions at any time during this study.

- For further information about the study contact: Crista Carlile, crista.carlile@drake.edu; (515) 371-1595 or Dr. Robyn Cooper (dissertation advisor) (phone: 515-271-4535, email: robyn.cooper@drake.edu).
- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 271-3472, irb@drake.edu.

You may keep a copy of this form for your records

Statement of Consent:

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. You may keep a copy of this form for your records. Even after signing this form, please know that you may withdraw from the study at any time.

I consent to participate in the study.

Participant's Name (printed) _____ Student ID Number _____

(Participant's Signature)

(Date)

(Signature of Parent/Guardian or
Legally Authorized Representative)

(Date)

APPENDIX C

Assent Form

Dear High School Student:

The purpose of the survey you are being asked to take is to help me gather information about your beliefs about mindset and relationships with others at school. You are being asked to take this survey because you are a high school student at Urbandale High School. There will be no direct benefits to you for finishing the survey. However, the information you provide as part of this survey will assist me in understanding how beliefs about mindset and relationships with others at school impact academic achievement in students. Results from this study may be published in journals and/or presented at conferences.

If you agree to take this survey, your commitment will only include the time it takes you to complete it. This time is estimated at ten minutes or less. Whether or not you choose to take the survey is completely up to you, and you may choose not to complete the survey. Your participation is anonymous, meaning there will be no way of connecting your answers back to you. You have minimal risk for taking part in the survey, such as discomfort with some questions. You may skip any questions you do not want to answer. If you choose not to complete the survey, it will not impact you at school at all.

If you have any questions about this survey, please contact me using the information below. If you agree to take part in the survey, please sign:

Student Name: _____ School ID Number: _____

Student Signature: _____ Date: _____

Thank you,

Crista Carlile
 Doctoral Candidate, Drake University
 4124 141st Street
 Urbandale, IA 50323
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If you have questions about your rights as a research participant, you may contact the Drake University Institutional Review Board (IRB), which is concerned with the protection of volunteers in research projects. The approved IRB protocol number for this study is XXXX-XXXXX. You may reach the board office at irb@drake.edu or (515) 271-DIRB (ext. 3472).

APPENDIX D

Survey Instrument

Please read each question carefully and select the answer that best describes you.

1. Type in your student identification number issued by your school district:

2. Select your age: 13 14 15 16 17 18

3. Select how you identify your gender: F M

If not listed, please enter your gender here: _____

4. Please rate your level of agreement with each of the following statements.

	Statement	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
1	The topics we are studying in my classes are interesting and challenging.				
2	Most of what is important to know you learn in school.				
3	I have good relationships with other students in my school.				
4	I can think of many ways to get good grades.				
5	When I am in my classes, I just act as if I'm working.				
6	Natural ability is more important than effort if you want to do well in school.				
7	You can learn new things, but you cannot really change your basic intelligence.				
8	Truly smart people do not need to try hard to be successful.				
9	I work hard to do my best in my classes.				
10	If I don't learn something quickly, I feel like I'm not smart.				
11	When doing school work, it is important that I understand what I am doing in order to learn the material.				

	Statement	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
12	I know I will graduate from high school.				
13	If you don't learn something quickly, you are not smart.				
14	If I don't learn something quickly, I give up.				
15	My education will create many opportunities for me.				
16	I check my school work for mistakes.				
17	Everyone has something they can improve if they try hard enough.				
18	If I don't do well on a test, I feel like I'm not smart.				
19	I often get bored in my classes.				
20	I am interested in TV shows, books or articles about the things we are learning in school.				
21	The harder I work at something, the better I will be at it.				
22	My teachers care about me.				
23	If I make mistakes, I feel unhappy with myself as a person.				
24	Sometimes I get so interested in my school work that I don't want to stop.				
25	The tests in my classes do a good job of measuring what I know or am able to do.				
26	Being smart is something you are born with.				
27	I can find many ways to address any problem.				
28	It is important to me that my teacher thinks I am good at my school work.				
29	I know I will find a good job after I graduate.				

	Statement	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
30	I can do well on any assignment if I try hard enough.				
31	School is important for achieving my future goals.				
32	I have a positive relationship with at least one adult in my school.				
33	There are some things people just can't learn.				
34	I always try to understand what the teacher is saying, even if it doesn't immediately make sense.				
35	If you work hard, you can change your level of intelligence.				
36	I pay attention in my classes.				