RESILIENCY AS A PREDICTOR OF STUDENTS’ FUTURE ACADEMIC PERFORMANCE

AND GRADUATION FROM HIGH SCHOOL

by

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Resiliency as a Predictor of Students’ Future Academic Performance and Graduation from High School

Thesis directed by Professor Alan Davis.

ABSTRACT

This study evaluated the predictive power of social and emotional factors on students’ academic performance and graduation vs. dropout status. Using a sample of 5,158 students from a large urban school district, the researcher found that three variables, Importance of Education, Money Difficulties, and Bad Feelings, accounted for 4.2% of the variance in Year 1 Attendance, 12.4% of the variance of residual GPA values and 4.4% of the variance of residual cumulative courses failed. Academic measures combined with the resilience measures correctly predicted 79.1% of students who dropped out and 81.6% of students who graduated. The inclusion of the resiliency variables did not increase the accuracy of prediction of dropouts when academic measures were considered alone. Through an examination of the predicted values’ group membership, the researcher found that the resilience measures correctly predicted 8.1% of students who dropped out that were incorrectly predicted to graduate by the academic measures.

The form and content of this abstract are approved. I recommend its publication.

Approved: Alan Davis
I dedicate this work to my husband Jason and son Luca, for keeping me grounded and
inspiring me to try to make the world a better place.
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LIST OF ABBREVIATIONS

ABC……Attendance, Behavior, and Coursework
CASEL…Collaboration for Academic, Social, and Emotional Learning
DPS…… Denver Public Schools
EWI……Early Warning Indicator
GPA……Grade Point Average
SEL……Social and Emotional Learning
SEM…..Structural Equation Modeling
CHAPTER I
INTRODUCTION

Statement of the Problem and Background Literature

One of the most important challenges in the United States today is the need to contain the nation’s dropout crisis. According to the U.S. Department of Education, Institute of Education Sciences, the high school graduation rate is 80% (Stetser & Stillwell, 2014). This rate is substantially lower for American Indians/Alaska Natives (67%), African Americans (69%) and Hispanics (73%). Additionally, students from low-income families have a graduation rate below the national average at 72% (ibid). More than 5.8 million youth between age 16 and 24 are neither in school nor employed (Burd-Sharps & Lewis, 2012). With economists predicting that at least 50% of new jobs in the next ten years will require some postsecondary education, our nation is at serious risk of falling short of meeting this demand (Georgetown University Center on Education and the Workforce, 2010).

High school dropouts have a deep impact on our nation’s economy. Some reports estimate that a person with a college degree earns an average $1 million more over a lifetime than a high school dropout (Cheesman Day & Newburger, 2002). Moreover, the nation suffers a significant loss of tax revenue for every student that drops out. One study estimates that if all the students in the Class of 2011 had graduated, the nation’s economy would have collected an additional $154 billion in tax revenue over these students’ lifetimes (Alliance for Excellent Education, 2011). Along these same lines, if the dropout rate remains the same for the next 10 years, the nation’s economy will lose $3 trillion in tax revenues (Balfanz, Fox, Bridgeland, & McNaught, 2009).
In addition to economic implications, the dropout crisis has a detrimental impact on our nation’s health. Much research illustrates a strong correlation between education and health, even when factors like income are taken into account. People with more education have fewer health issues and live longer healthier lives. Studies have shown that lower levels of education and adverse effects on brain, cognitive, and behavioral development early in life are closely linked with imperative health outcomes later in life, including cardiovascular disease and stroke, hypertension, diabetes, obesity, smoking, drug use, and depression. These conditions account for a major segment of preventable conditions that cause premature mortality in the U.S. (Miller, Simon, & Maleque, 2009).

Education is also directly linked to employed income; individuals who have more income are able to afford adequate health care, can make healthier choices for nutritious foods and exercise, and live in safer homes and neighborhoods. Individuals with lower income have limited financial resources to support a healthy lifestyle and deal with unexpected illnesses and other health-related challenges. They also experience greater levels of stress, which can be a trigger for many serious health-related outcomes (Cutler & Lleras-Muney, 2006). Increasing high school retention is therefore critical to promoting social and economic mobility and reducing health related disparities.

Some progress to curtail the dropout crisis is being made. Many states are achieving improvements in graduation rates and state exam scores, and there are fewer “dropout factories” (schools that graduate less than 60% of their students) than there were ten years ago (Balfanz, Bridgeland, Fox, DePaoli, Ingram, & Maushard, 2014). Some districts/schools have been relatively successful in improving academic outcomes (including increased graduation rates) especially for low income and minority students,
and there is some consensus in the effectiveness of those similar tactics used within these schools (Cotton, 2003; Lezotte & Snyder, 2011). School districts are beginning to utilize more effective practices to address the needs of their students; some states/districts are getting better at allocating funds toward effective programming and interventions; and improvements in data collection and analysis are enabling schools and districts to create effective early warning systems.

Many argue that early warning systems are essential to education reform. These systems can be a powerful tool, for a student can be identified for being at-risk of dropping out early on. In fact, research shows that students who drop out of high school usually do not wake up one day and abruptly make the decision to stop going to school; rather, they gradually become disengaged through a slow process that begins as early as elementary school (Bruce, Bridgeland, Fox, & Balfanz, 2011). Students who are not connected to school at an early age are increasingly at-risk for failing academically in middle and high school (Blum & Libbey, 2004). This is a significant problem because by the time students enter the ninth grade, 40-60% of all students are chronically disengaged from school (Klem & Connell, 2004). Early warning systems are important because much research also shows that even the most at-risk students can graduate if they are identified and given the proper supports early enough (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). It is therefore essential for educators to utilize effective early warning systems so they can identify and plan interventions for at-risk students before they get to the point where they drop out of school.

**Purpose of the Study**

Previous research has determined that social emotional factors are fairly strong
predictors of future academic performance (Davis, Solberg, De Baca, & Hargrove, 2014). The purpose of this study is to further examine the relationship between social and emotional learning skills and academic performance measures, including graduation vs. dropout. This research could provide schools with an improved early warning system strategy for identifying at-risk youth and understanding the root cause of why students are or may likely become at-risk for dropping out of high school. This knowledge will enable educators to better design appropriate personalized intervention strategies for those students most in need.

Research Questions

The research questions this thesis will strive to answer are: 1) How well do 8th grade social and emotional scores predict various high school academic outcomes, including dropout rates? 2) What is the relationship between academic measures and social and emotional measures and their ability to predict graduation vs. dropout? 3) Are the resilience measures able to effectively predict dropouts who are not identified by ABC measures?

Hypothesis

The researcher expects to find that social and emotional skills are predictive of students' academic performance and graduation vs. dropout. The researcher also expects to find a correlational relationship between academic measures and the social and emotional and measures and that the latter can explain an additional amount of variance of graduation vs. dropout. Finally, the researcher anticipates that the social and emotional measures are able to identify some at-risk students that are not correctly identified by the ABC measures.
CHAPTER II

LITERATURE REVIEW

Early Warning Systems

According to the U.S. Department of Education, an effective early warning system includes the following components: 1) is research- and evidence-based; 2) is comprised of key data points that are readily available to school districts; and 3) is an effective predictor of students’ likelihood to dropout vs graduate without additional supports or intervention (“Jobs for the Future,” 2014). Thirty-one states currently use some version of an early warning system, a jump from 18 states in 2011 (“Data Quality Campaign,” 2013). Early warning systems emerged in part due to breakthroughs in the types of data analyses that enable educators to systematically use key data points to identify students at-risk of dropping out. Much progress has been made in the last decade in the development of early warning systems that identify students at-risk of dropping out, and several factors have contributed to the rise of their use in schools/districts. One factor is a surge of attention on the nation’s dropout crisis: schools/districts, along with communities, government entities, and educational organizations have made it a priority to identify better systems and approaches for reducing the nation’s dropout rate (Ibid). A second factor is the enhancement of student information systems and ready access to school databases and student data. Thirdly, a growing body of research is providing strong evidence that early identification of a student’s likelihood to drop out is possible and that graduation rates increase when educators use this information effectively in providing school improvements and targeted interventions (Allensworth & Easton, 2007; Balfanz, Herzog, & MacIver, 2007; Neild & Balfanz, 2006).
The ABC Early Warning Indicator

One of the most widely used early warning indicators (EWI), a key component of early warning systems, was developed by researchers from the Consortium of Chicago School Research, the Center for Social Organization of Schools at Johns Hopkins University, and the Philadelphia Education Fund. This indicator is referred to as the ABC indicator and is comprised of three key data points: Attendance (defined by missing 20 days or 10% of school days), Behavior (defined by two or more serious behavior infractions), and Course Performance (defined by “an inability to read at grade-level by third grade; failure in English or math in sixth-ninth grade; a GPA of less than 2.0; two or more failures in ninth grade courses; and failure to earn on-time promotion to the tenth grade”) (Bruce, et al., 2011, pg. 3; Pinkus, 2008).

Researchers followed students beginning in the 6th and 8th grades, respectively, and tracked their outcomes through high school. The ABC indicator was found to effectively identify 60% of dropouts who were marked at-risk in all of the ABC measures. Additionally, only 29% of students who were marked at-risk in one or more of the ABC measures went on to graduate from high school (Balfanz, Herzog, & MacIver, 2007). These studies demonstrated the importance of the transition to high school and also confirmed the predictive power of the ABC indicator. These findings have since been validated numerous times, including similar longitudinal research studies conducted in AK, CO, FL, IN, TN, TX and VA (Balfanz, Fox, Bridgeland, & McNaught, 2009).

Social and Emotional Skills as an Early Warning Indicator

Social and emotional factors are another key data point that could act as an EWI. Some research has illustrated that social and emotional skills (specifically levels of resilience) are predictive of students’ future academic outcomes. The Collaborative for
Academic, Social, and Emotional Learning (CASEL), a prominent organization in this field with a mission to advance the development of social and emotional learning, defines social and emotional learning as “the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions” (“What is social and emotional learning?,” 2015). Resilience, a key component of social and emotional learning, is shown to be a critical facet. Referring to the ability to succeed in school despite adverse conditions such as poverty or abuse, resilience includes components such as confidence, a sense of well-being, motivation, an ability to set goals, relationships/connections, and stress management (Close & Solberg, 2008).

**Improved Academic Performance through Social and Emotional Skills**

Much research shows that resilience can significantly affect school and life outcomes for youth, including academic success, even for students who are faced with great adversity (Benson, Leffert, Scales, & Blyth 1998; Scales, Benson, Leffert, & Blyth, 2000). Furthermore, these skills can be learned, measured, and have lasting effects on academic performance (Bernard, 2004; Close & Solberg, 2008). Much research has demonstrated a connection between resilience and academic success. A longitudinal study by Scales, Roehlkepartain, Neal, Kielsmeier, and Benson (2006) found that higher levels of resilience are strongly correlated with higher grade point averages (GPAs) among middle and high school students. These findings hold true over time; students reporting more characteristics of resilience early in the study had higher GPAs three years later, compared to students with fewer assets at the start (Ibid).
Similarly, in a series of studies conducted by the U.S Department of Education, Waxman and Huang (1997) assessed inner-city students in the south-central United States. They found that students who ranked in the 90th percentile on the standardized tests in mathematics were highly resilient, reporting significantly higher levels of task orientation and satisfaction, social self-concept, achievement motivation, and academic self-concept than their counterparts who ranked below the 10th percentile.

Reyes and Jason (1993) designed a study to understand successful high school students in an inner-city school. Two groups of Latino students were identified as being either at low or high risk for dropping out of school; all students shared a similar socioeconomic status, parent-student involvement, and parental supervision. They found that the low risk students reported strong resiliency, an attribute that the high risk students were significantly lacking.

Hanson and Austin (2003) conducted a longitudinal study of students in California and found that nearly every measure of resilience was positively related to concurrent test scores. The highest increases in test scores occurred in schools where the students reported high levels of resilience. Moreover, resilience development proved to be equally beneficial for successive test score improvements in both low and high performing schools.

Toldson (2008) in his *Breaking Barriers* study, examined the social, emotional, and cognitive factors contributing to the academic success of African American males (n=6000). Four overarching components empirically linked to academic performance were identified: 1) personal and emotional factors, such as emotional well-being and self-esteem; 2) family factors, including household composition, parents’ education and
relationship with their children; 3) social and emotional factors, including economic standing and community involvement; and 4) school factors, relating to their perceptions of school and relationships with teachers.

**Background on the Social and Emotional Skills in this Study**

In his work to pinpoint the aspects of resiliency most closely linked to academic performance, Solberg et al. (1998) identified six key skills as the foundations of educational resiliency: building confidence, making connections, setting goals, managing stress, increasing well-being, and understanding motivation. Studies conducted by Solberg in Milwaukee Public Schools between 1998 and 2004 show that when students learn about and cultivate these six skills, their school performance improves significantly (Solberg, Carlstrom, Howard, & Jones, 2007; Bandura, 1986; Cohen & Wills, 1985; Dohrenwend & Dohrenwend, 1974; Eccles & Wigfield, 2002; Egeland, Carlson, & Sroufe, 1993; Hobfoll, 1989; Ryan & Deci, 2002; Werner & Smith, 1992). The Solberg instrument is the social and emotional instrument that will be used in this study.

**Academic self-efficacy:** This construct refers to the degree to which a student feels capable of successfully performing school-related tasks (Solberg et al., 1998; Solberg, O’Brien, Villarreal, Kennel, & Davis, 1993). Albert Bandura and his colleagues found that individuals who possess higher academic confidence beliefs are more likely to persist when challenged with difficult academic material, perform better during tests, and perceive negative performance evaluations as challenges to overcome rather than threats to avoid. As a construct, academic self-efficacy has been consistently found to be associated with a range of academic outcomes (Schunk & Pajares, 2009) and meta-
analysis has established an average medium effect size between academic self-efficacy and school outcomes (Multon, Brown, & Lent, 1991; Schunk & Pajares, 2009).

**Motivation:** The model of motivation assessed in the Solberg instrument was drawn from Deci and Ryan’s self-determination theory. In their model, motivation includes both extrinsic motivation and self-determined, or intrinsic motivation. Extrinsic motivation refers to performing an activity because one feels forced to do it or because one is concerned with disappointing others; extrinsic motivation results in a person performing the activity in order to avoid sanctions or guilt. Intrinsic motivation, on the other hand, involves choosing to perform the behavior because it is perceived as meaningful or enjoyable (Close & Solberg, 2008; Ryan & Deci, 2002, 2008). It has been well established that youth develop self-determination when educators create a personalized, caring, and relational classroom environment in which the youth receive choices and engage in autonomy-supportive interactions (Deci, Schwartz, Sheinman, & Ryan, 1981).

**Connections:** This construct is based on a tremendous amount of research that links the quality of social support systems to development and health. Most notably, research has indicated that perceived availability of social support consistently provides health benefits during times of stress. One theory argues that during times of high stress, social support acts as a buffer to protect one from becoming ill. Another theory argues that social support enhances one’s overall health regardless of stress level (Cohen & Wills, 1985; Dohrenwend & Dohrenwend, 1974). In a recent study of anxiety among African American youth, Lewis, Byrd, & Ollendick (2012) found that stress was
associated with increased anxiety and availability of social support was associated with lower anxiety.

**Importance of School:** This construct measures how well students value education and whether they feel education will help them achieve their desired life and career goals (Eccles & Wigfield, 2002). Research has demonstrated that youth attain higher academic performance when they perceive the subject matter as relevant to and supportive of their future life goals (Eccles, 2005; Harackiewicz, Durik, Barron, Linnenbrink-Gracia, & Tauer, 2008; Hulleman, Godes, Hendricks, & Harackiewicz, 2010; Hulleman & Harackiewicz, 2009). Goal setting has been shown to result in better health and well-being at later phases of life. One longitudinal study conducted by Paul Baltes and his colleagues found that healthier life outcomes were related to individuals who engaged in three goal-setting strategies. These strategies form the title of the researchers’ SOC (selection, optimization, compensation) model. Individuals who had higher SOC ratings selected a few goals, optimized their opportunities to achieve those goals, and compensated by switching or modifying goals when faced with adversity (Baltes, 1997).

**Stress:** Noted psychology professor Stevan Hobfoll argued that stress can be understood as one’s ability to conserve emotional, psychological, and behavioral resources (Hobfoll, 1998). Research has consistently found a very strong correlation between academic confidence and academic stress. This means that individuals with stronger academic confidence have the personal resources they need to manage the pressures associated with performing academic-related tasks (Solberg, et al., 1998; Torres & Solberg, 2001; Solberg & Villareal, 1997).
Literature has highlighted the risk of coexistence among emotional, psychological, and academic dimensions in which a student with problems in one domain is more inclined to concurrently have difficulties in other domains, such as academic performance. In contrast, youth with positive academic outcomes and minimal psychological distress tend to be better adjusted (Valdez, Lambert, & Ialongo, 2011).

Furthermore, research has demonstrated that students with low stress were more likely to continue their education and had higher GPAs than those that experienced higher levels of stress (Dornbusch, Mont-Reynaud, Ritter, Chen, & Steinberg, 1991; Gillock & Reyes, 1999; Windle & Windle, 1996).

**Health and Well-being:** This construct is closely linked to stress; many cumulative risk factors affect health and well-being. For youth living in lower-income communities, cumulative risk factors include access to health care during neonatal development, birth, and childhood; quality of housing; and level of community violence. Living in situations characterized by high cumulative risk can result in chronic stress and health concerns. Some implications of this include increased drug use, risky sexual activity, and school failure (Evans, 2004; McEwen, 1998). Additionally, a longitudinal study, in which student mental health was examined by well-being and psychological distress indicators, found that students with a combination of low well-being and higher levels of distress were most at risk for low GPAs (Suldo, Thalji, & Ferron, 2011).

In previous research, structural equation modeling was used to evaluate these social and emotional learning factors in relation to both one another and academic outcomes. Students who stated they had strong connections to teachers and peers also stated that school was more meaningful, enjoyable, and relevant to their future goals.
Higher academic self-efficacy was associated with students’ belief that education was relevant and also with a higher sense of well-being. The combination of academic motivation, academic self-efficacy, and health management was associated with recording better academic outcomes during their initial entry into the ninth grade (Close & Solberg, 2008). An extension of this research illustrated that academic self-efficacy mediates the relationship between motivation and academic stress and that perceived importance of education was predicted by a combination of academic self-efficacy and motivation (Gillis, 2011).

Social and Emotional Factors as an Improved Early Warning Indicator

In summary, while much research shows that attendance, behavior, and coursework are strong predictors of students’ future academic success, a growing number of studies show that social and emotional skills are also a key factor in whether students drop out or graduate (Close and Solberg, 2008; Eccles, 2005; Benson et al., 1998). Previous research has demonstrated that resilience skills assessed at the end of middle school can effectively predict future high school academic success and serve as an early warning indicator for future dropout risk (Davis et al., 2014).

Combining the ABC indicator with a social and emotional index can provide an improved EWI for a couple of reasons. First, research has shown that the ABC indicator does not identify all students who are or may become at-risk for dropping out. In the same study that found the ABC indicators to effectively predict 60% of dropouts, researchers also found that nearly one-fourth of the students who went on the drop out of high school were not marked at-risk by any of the ABC measures (Balfanz, Herzog, & MacIver, 2007). Social and emotional measures may be able to identify some of these
students since they identify underlying issues that may not yet be manifesting in the
students’ academic performance.

Second, social and emotional data is not only predictive of students’ likelihood to
drop out, but it also provides educators with the root causes of why students are
disengaged and struggling. For example, two students might be failing math for very
different reasons: the first might simply be struggling with the concepts and might need
more one-on-one tutoring; the second might be dealing with money difficulties at home
and skips school to provide income for the family. The interventions for these two
students are very different, yet access to the ABC indicator alone does not shed light on
why the students are failing. Only when the educator understands the students’ social and
emotional skills can he/she provide the students with the proper supports and tailored
interventions.

A third limitation of the ABC indicator is that it is only retroactive – it is solely
based on students’ past academic performance. If academic data is unavailable (i.e. due to
an out-of-district transfer or inability to obtain a student’s academic record), then the
district loses the benefit of the predictive value of the ABC indicator. But if the school
administered a social and emotional assessment when the student enrolled in the district,
educators could be made aware of any underlying issues that could contribute to
disengagement, academic failure, and dropping out. Because social and emotional skills
can be measured at any point in time, this indicator therefore has more flexibility in its
ability to act as a readily accessible data point – a key element of an effective early
warning system.

More research is needed to examine the relationship between social and emotional
skills and academic performance, specifically as they relate to and are able to predict whether students graduate or drop out of high school. Schools could benefit from an improved early warning indicator that 1) more accurately identifies students at-risk for dropping out of high school; and 2) provides an improved ability to identify root causes of why students are struggling, which would enable educators to design more appropriate and personalized interventions.
CHAPTER III

METHODS

Research Design and Setting

This study will utilize academic data from Denver Public Schools (DPS) for three cohorts of students who entered the ninth grade in 2008, 2009, and 2010. Students’ social and emotional data was obtained through ScholarCentric’s validated resilience assessment, which measures students’ perception on the importance of education; confidence levels; sense of well-being; connections with family, teachers, and peers; levels stress; and whether they are motivated to learn (Close & Solberg, 2008). The assessment is based on 20 years of university research led by Dr. Scott Solberg (currently at Boston University) and a team of researchers at the University of Wisconsin. To date, approximately 130,000 students have taken the resilience assessment across the U.S. DPS has utilized ScholarCentric’s resilience assessment as a district-wide initiative since 2007. The district currently uses the data within both the middle and high schools as part of their early warning system to help identify at-risk students and target appropriate wrap-around services and interventions.

The researcher will link the students’ resilience scores with academic performance measures captured by DPS. Academic indicators include: grade point averages (GPAs), attendance, behavior incidents, cumulative courses failed, 9th and 10th grade state exam scores, and graduation vs. dropout status. The researcher will analyze the relationships using linear regression and logistic regression.

The researcher has been an employee of ScholarCentric since 2008; the company granted access to the resiliency data for the purposes of this research. The academic data
was obtained through a formal research request through DPS. This thesis research was approved by the Colorado Multiple Institutional Review Board (COMIRB).

Participants

This study will utilize a sample from three cohorts of DPS students which consists of a total of 5,158 students who completed ScholarCentric’s resiliency assessment as incoming ninth graders in 2008 (n=1295), 2009 (n=1701), and 2010 (n=2103). The sample is comprised of the following race/ethnicity groups: 51% Hispanic, 20% White, 19% African American, 6% Native Hawaiian or Other Pacific Islander, 3% Asian and 1% American Indian or Alaskan Native. There were 48% males, and 64% of the students qualified for free or reduced lunch.

Measures

*Dependent Variables – Academic Performance*

A number of high school academic performance indicators were employed as dependent variables and include: exit code, GPAs, attendance, cumulative failed courses, behavior incidents, and state exam scores. All three cohorts (2008, 2009, and 2010) had academic data for at least four years of high school.

**Exit Code.** Using DPS’s Exit Code descriptions, the researcher recoded the Exit Codes into the following categories: 1) transferred out of the district; 2) still in school; 3) dropped out and did not return; 4) dropped out but returned to graduate; and 5) graduated. DPS reported 3,680 students who graduated, 436 who dropped out, and 70 who returned to graduate after having previously dropped out. Due to time limitations, this study will only focus on students who either graduated or dropped out and did not return.
GPAs. Cumulative GPA data was provided by year and was measured on a 0-5 scale (with 5 given for an A in an Advanced Placement or IB course). Each year’s GPA reflects the total GPA for all high school courses completed. For instance, Year 1 includes just 9th grade; Year 2 includes the cumulative GPAs of Years 1 and 2; etc.

Attendance, Cumulative Failed Courses, Behavior Incidents, and State Exam Scores. Attendance data is listed as percentage of time attended and includes rates for each year. Cumulative courses failed were reported as one variable to include courses failed in 9th-12th grades. Behavior incidents include both expulsions and number of in- and out-of school suspensions. State exam scores include exam scores for Math, Reading, and Writing for the 9th and 10th grades. These measures were continuous scale scores, which were vertically equated to allow them to serve as a measure of growth from grade to grade.

Independent Variables – Factor Analysis of Resilience Measures

The ScholarCentric assessment includes a total of 108 questions, which are grouped into six resilience factors and 18 subscales. The researcher wanted to test whether the subscales’ reliability and their predictive power would increase with revised subscale categorizations. The researcher thus ran exploratory factor analysis on the items in each of the original six factors. To do this, the six factors were separated into 2 groups:

- Group A included the items from: Education, Connections, and Stress
- Group B included the items from: Confidence, Well-being, and Motivation

The items were analyzed using principal components analysis with varimax rotation as an initial step in examining construct validity by demonstrating that the items are highly correlated with other items in the same subscale, and less correlated with items in other
subscales. Reliability was evaluated using Cronbach alpha estimates of internal consistency. The rotated factor solution identified thirteen factors, with alpha reliabilities ranging from .679 (one scale) to .93. Six of the new factors were selected for analysis due to their high alpha reliabilities: Money Difficulties, Ability to Perform in School, Education, Bad Feelings, Intrinsic Motivation, and Family Connections (see Appendix A for the full survey questions; Appendix B for the factor loadings of the new skills; and Appendix C for the reliability values of the new resilience measures).

Independent Variables – New Resilience Measures Descriptions

**Money Difficulties.** This measure contains 5 items that assess the degree to which students have difficulty paying for items they need (i.e. food, school supplies). Responses range from 1 (almost never) to 5 (almost always), with higher scores indicating a greater degree of difficulty. Internal consistency coefficient for the total scale using Cronbach’s alpha was .89.

**Ability to Perform in School.** This measure contains 9 items that assess the degree to which students have difficulty performing academic-related tasks (i.e. taking tests, completing homework on time). Responses range from 1 (almost never) to 5 (almost always), with higher scores indicating a greater degree of difficulty. Internal consistency coefficient for the total scale using Cronbach’s alpha was .883.

**Education.** This measure contains 10 items that assess the degree in which students value education and believe school and college are important to their future (i.e. it is important that I finish, go to college, etc.). Responses range from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a greater value of education. Internal consistency coefficient for the total scale using Cronbach’s alpha was .93.
Bad Feelings. This measure contains 14 items that assess how often students have negative health-related experiences with manifestations in aggression, physical symptoms, or depressed feelings (i.e. breaking things when angry, headaches, feeling hopeless). Responses range from 1 (almost never) to 5 (almost always). Note that ScholarCentric “flips” the student responses within this construct to make the reports that the company provides to schools easier to read. This study utilizes the “flipped” scores, which mean that higher scores indicate a higher sense of well-being and lower scores indicate a lower sense of well-being. Internal consistency coefficient for the total scale using Cronbach’s alpha was .921.

Intrinsic Motivation. This measure contains 7 items that assess whether students go to school because they find it meaningful (i.e. the reason I keep coming to school is because I really enjoy school, because education is important for the goals I have, etc.). Responses range from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating a higher intrinsic motivation. Internal consistency coefficient for the total scale using Cronbach’s alpha was .893.

Family Connections. This measure contains 5 items that assess the degree to which students feel supported by their family members (i.e. I am very close to at least one member of my family). Responses range from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating stronger support from family. Internal consistency coefficient for the total scale using Cronbach’s alpha was .827.

Correlations

Correlations were run on the new resilience measures described in section 3.3.b. and the academic performance measures (3.3.a.). Table 1 reports the means, standard
deviations, and correlations among the variables. Cumulative GPA and State Exam Scores generally had the highest correlations of the academic variables.

TABLE 1
Summary of Intercorrelations, Means, and Standard Deviations for Scores on SEL Measures and Academic Performance Variables

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Money Difficulties</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ability to Perform in School</td>
<td>.577</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Education</td>
<td>-.186</td>
<td>-.174</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Bad Feelings</td>
<td>-.492</td>
<td>-.569</td>
<td>.167</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Intrinsic Motivation</td>
<td>-.178</td>
<td>-.257</td>
<td>.482</td>
<td>.197</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. Family Connections</td>
<td>-.260</td>
<td>-.281</td>
<td>.418</td>
<td>.285</td>
<td>.395</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Cumulative GPA (Year 4)</td>
<td>-.227</td>
<td>-.213</td>
<td>.206</td>
<td>.169</td>
<td>.163</td>
<td>.137</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. 9th Grade State Exam–Math</td>
<td>-.211</td>
<td>-.232</td>
<td>.168</td>
<td>.170</td>
<td>.087</td>
<td>.095</td>
<td>.635</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. 9th Grade State Exam–Reading</td>
<td>-.237</td>
<td>-.227</td>
<td>.201</td>
<td>.154</td>
<td>.109</td>
<td>.132</td>
<td>.651</td>
<td>.751</td>
<td>–</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. 9th Grade State Exam–Writing</td>
<td>-.237</td>
<td>-.226</td>
<td>.201</td>
<td>.154</td>
<td>.109</td>
<td>.132</td>
<td>.651</td>
<td>.751</td>
<td>1.000</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Cumulative Attendance</td>
<td>-.118</td>
<td>-.084</td>
<td>.111</td>
<td>.108</td>
<td>.078</td>
<td>.037*</td>
<td>.531</td>
<td>.252</td>
<td>.234</td>
<td>.234</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>1.72</td>
<td>2.30</td>
<td>4.52</td>
<td>4.02</td>
<td>3.94</td>
<td>4.35</td>
<td>2.85</td>
<td>556.66</td>
<td>550.09</td>
<td>549.98</td>
<td>.85</td>
<td>4.86</td>
</tr>
<tr>
<td><strong>SD</strong></td>
<td>.84</td>
<td>.83</td>
<td>.59</td>
<td>.81</td>
<td>.80</td>
<td>.70</td>
<td>.96</td>
<td>67.88</td>
<td>70.49</td>
<td>70.47</td>
<td>.14</td>
<td>6.69</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).
All other values are significant at the 0.01 level (2-tailed).

Procedures of Data Collection

Academic Performance Data

Academic performance data was provided by DPS and includes the following variables: GPAs, behavior incidents, cumulative courses failed, attendance, state exam scores, and graduation vs dropout status. This data was provided for up to five years of
the students’ enrollment in high school – grades nine, ten, eleven, twelve, and fifth year twelfth. Due to time limitations, this study will only include data for grades nine through twelve, decision made based on research showing that the majority of students who graduate do so on time (Neild & Balfanz, 2006).

The researcher matched the resilience and academic data by district-assigned Student IDs and then stripped the file of the ids to maximize the protection of student privacy. To account for students who repeated one or more grades, the researcher categorized the data by year, rather than by grade. Table 2. illustrates this categorization system. Eighth grade year indicates the year the student ended the 8th grade (i.e. Cohort 1 was in 8th grade during the 2007-2008 school year), and Year 1 indicates the year the student first entered high school. Years 2-5 indicate the subsequent years the student was enrolled in high school.

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Data Categorization by Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th grade Year</td>
<td>Year 1</td>
</tr>
<tr>
<td>Cohort 1</td>
<td>2008</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>2009</td>
</tr>
<tr>
<td>Cohort 3</td>
<td>2010</td>
</tr>
</tbody>
</table>

Resilience Data

Resilience data was collected by ScholarCentric through the company’s online resilience assessment. The survey was administered to students the summer prior to entering the ninth grade. Teachers and other educators administered the assessment as part of normal education practice in a normal education setting. At no time did the researcher have contact with students. The ScholarCentric resilience survey consists of
108 questions, is available in English and Spanish, and takes students approximately 30 minutes to complete (See Appendix A for the full survey questions).

*Missing Data.*

Missing values were not imputed for dependent variables; cases with missing data for a dependent variable were dropped from the analysis involving that dependent variable. Missing items within the social emotional subscales ranged from .4% to 4.7% of cases, depending upon the subscale. In those cases, if two or more items were answered, the mean of the answered items was substituted for missing items within the subscale. If fewer than two of the items for a scale were complete, the case was dropped from the analysis.
CHAPTER IV

RESULTS

The analysis employed linear regression and logistic regression to determine the percent of variance in GPA, cumulative courses failed, and attendance attributable to the measured social and emotional variables. Due to time and data availability constraints, the academic measures were limited to these variables.

Bivariate correlations among the independent variables (see Table 1.) were examined to identify variables with the highest correlations that would contribute to multicollinearity if used together in a regression analysis. The three variables Money Difficulties, Importance of Education, and Bad Feelings emerged as the highest social and emotional bivariate correlates of Year 1 Attendance (r=.133, r=.145, and r=.159, respectively). The remaining independent variables were omitted to avoid multicollinearity. In a linear-regression analysis, these variables explained 4.2% of the variance in Year 1 Attendance (R=.205, R2=.042, p < .001). Residual attendance values, in which the variance explained by the resilience measures was removed, were saved. Linear regression found that residual attendance explained 31% of the variance in Year 1 GPA (R=.553, R2=.306, p < .000) and 18% of the variance in cumulative courses failed (R=.419, R2=.175, p < .000). Multiple regression was then used to account for variance in GPA associated with resiliency after controlling for attendance. The three resiliency variables (Money Difficulties, Importance of Education, and Bad Feelings) explained 12.4% of the variance of the residual GPA values (R=.353, R2=.124, p < .000) and 4.4% of the variance of the residual cumulative courses failed (R=.211, R2=.044, p < .000).
Logistic regression found that Year 1 Attendance and Year 1 GPA correctly predicted 33.9% of students who dropped out and 98.2% of students who graduated (cut value=.5, Cox & Snell R2=.196, Nagelkerke R2=.404). These academic measures combined with the three resilience measures correctly predicted 33.1% of students who dropped out and 98.3% of students who graduated (cut value=.5, Cox & Snell R2=.192, Nagelkerke R2=.404). When the cut value was increased to .9 (to err on the side of over-identifying students predicted to drop out), logistic regression found that the academic measures correctly predicted 79.7% of students who dropped out and 80.8% of students who graduated (Cox & Snell R2=.196, Nagelkerke R2=.404). Using this same cut value, the academic measures combined with the resilience measures correctly predicted 79.1% of students who dropped out and 81.6% of students who graduated (Cox & Snell R2=.192, Nagelkerke R2=.404). The inclusion of the three resiliency variables did not increase the accuracy of prediction of dropouts or graduates.

The predicted values’ group memberships were saved in order to determine if the resilience measures accurately identified dropouts that were not correctly identified by the academic measures. The resilience measures correctly identified 8.1% of students who dropped out and had been incorrectly identified as predicted to graduate by the academic measures. Both the academic and resilience measures incorrectly identified 12% of dropouts.
CHAPTER V
DISCUSSION AND CONCLUSION

Early warning systems are a critical component of schools’ ability to improve their graduation rates, and they depend on readily accessible useful/actionable data and effective EWIs that accurately predict students’ future academic performance. This study evaluated 1) whether 8th grade resilience measures are predictive of various high school academic outcomes, including dropout rates; 2) the relationship between academic measures and social and emotional measures and their ability to predict graduation vs. dropout; and 3) whether the resilience measures are able to effectively predict dropouts who are not identified by ABC measures.

The three social and emotional measures Money Difficulties, Importance of Education, and Bad Feelings were found to be significant predictors of Year 1 GPA and cumulative courses failed, after controlling for the amount of variance explained by these resilience measures on attendance. Attendance was selected as the academic benchmark because of the immense amount of research linking this measure with student’s academic success (Bruce, et al., 2011; Pinkus, 2008). Attendance is so important because this measure is highly correlated with a variety of other academic variables including GPAs, state exam scores, fail rates, dropping out, etc. (Balfanz, Herzog, & MacIver, 2007). In short, a missed day of school is a missed opportunity to learn.

Behavior incidents were not included in the regression analysis due to a large amount of missing data on this variable. Due to time constraints, the researcher focused on GPA, cumulative failed courses, attendance and graduation vs. dropout status. It would be interesting to revisit the analysis and include state exam scores, since these had
some of the highest correlations of the academic variables with the resilience measures. GPA and attendance alone correctly predicted 79.7% of students who dropped out and 80.8% of students who graduated; these findings are consistent with earlier research mentioned in the Literature Review that established the ABC indicators as predictive of future academic outcomes (Bruce, et al., 2011; Pinkus, 2008). This amount of predictive power was retained when the three resilience measures were combined with GPA and attendance: the combined measures correctly predicted 79.1% of students who dropped out and 81.6% of students who graduated. These results were dependent on a cut-value of .9; the researcher made the decision to err on the side of over-predicting dropouts because the risks of false positives outweigh the risk of under-identifying students at-risk of dropping out. Through an examination of the predicted values’ group membership, the researcher discovered that the resilience measures correctly predicted 8.1% of students who dropped out that were incorrectly predicted to graduate by the academic measures. This suggests that the resilience measures add additional predictive value in that they are able to identify some students who are at-risk of dropping out but fell under the radar of the academic measures. A total of 12% of students who dropped out were not correctly identified by either the academic or resilience measures. This information reveals that there are other elements beyond academic and social and emotional factors that are contributing to student dropouts.

In addition to the ability to effectively predict academic performance and graduation vs. dropout status, resilience measures provide educators with information on the root cause behind students’ disengagement and likelihood of dropping out. This can be powerful information because it can enable educators to better understand students’
individualized needs and create customized interventions accordingly. Further, because resilience is malleable, educators can improve academic outcomes through SEL instruction. Resilient students are more self-regulated and engaged learners, and they perceive the value of education on their future goals (Zimmerman, 2011; Hulleman et al., 2010; Hulleman & Harackiewicz, 2009).

The reader should be careful to not generalize the results of this correlational study. The sample of this research was limited to a single school district, and replication with other school districts would strengthen the analysis. In addition, social and emotional measures were assessed using self-report data, and therefore all limitations associated with traditional survey research are warranted.

Finally, the analysis may be strengthened by an analysis of structural equation modeling (SEM) and/or path analysis. A main benefit of SEM (an extension of multiple regression) is that it is able to examine relationships between latent constructs represented by multiple measures and isolate observational error from measurement of latent variables (Lei & Wu, 2007). Path analysis (which falls under the umbrella of SEM) may offer more explanatory power than the methods used in this project because it is able to accommodate the existence of multiple dependent variables. Path analysis identifies three types of effect: 1) direct effects; 2) indirect effects; and 3) total effect. This method may better explain the complex and intertwined relationships of the factors contributing to student dropouts because it accounts for the association of one variable with another mediated through other variables in the model (Streiner, 2005).

In summary, the inclusion of social and emotional measures into schools’ early warning systems meet the criteria required for an effective early warning system.
(research and evidence-based; readily accessible data points; and effective predictor of graduation vs. dropout status) and may result in a more effective system for a number of reasons. First, social and emotional factors, combined with GPA and attendance are fairly strong predictors of students’ future academic performance and graduation vs. dropout status. Second, by understanding why students are struggling academically, educators can more effectively design tailored interventions to address students’ individual needs. This study focused on the resilience measures Importance of Education, Bad Feelings, and Money Difficulties. Although the latter of these factors is largely outside of the school’s sphere of influence, schools can and should provide resources to help students cope with bad feelings, and schools need to work on providing motivating environments and persuading students that education has intrinsic value and is not simply a societal expectation. And thirdly, these factors may be able to accurately identify a percentage of students at-risk for dropping out of high school who are not marked at-risk by academic measures.
REFERENCES


APPENDIX A

SCHOLARCENTRIC’S RESILIENCE ASSESSMENT QUESTIONS

Importance of Education

This section asks about your beliefs about the importance of school and college. Mark the number on the answer sheet that best represents your present attitude of opinion.

Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Strongly disagree
2 = Disagree
3 = Neutral/undecided
4 = Agree
5 = Strongly agree

Using the scale above, please mark the number on the answer sheet that best shows *the degree to which you agree with each statement below:*

1. Finish school.
2. Do well in school.
3. Go to college.
4. Do well in college.
5. Make sure my teacher knows that I want to do well in school.
6. Find out about colleges.
7. Learn how to be successful in college.
8. Get good grades in school.
9. Learn how to be successful in school.
10. Get a college degree.

Confidence

This section asks for information about the degree of confidence you have in completing a variety of activities with being a student at your school. Mark the number on the answer sheet that best represents your present attitude or opinion. Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Not confident at all
2 = Mostly not confident
3 = Somewhat confident
4 = Mostly confident
5 = Extremely confident

Using the scale above, please mark the number on the answer sheet that best shows *the degree to which you feel confident in successfully…* 

11. Making new friends at school.
12. Talking to teachers about homework.
13. Taking good notes in class.
14. Writing a paper for English class.
15. Joining a sports activity.
17. Asking a question in class.
18. Joining an after-school club.
20. Turning in your assignments on time.
21. Going to class every day.
22. Working on a group class project.
23. Getting along with classmates.
24. Doing well on your tests.
25. Using a computer to write a paper.
26. Using the library.
27. Using a computer to write a paper.
28. Participating in class discussions.
29. Keeping up to date on schoolwork.
30. Preparing for a test.
31. Relaxing during a test.
32. Studying with others for a test.

**Connections**

This section asks your relationships with family, teachers, and friends. Mark the number on the answer sheet that best represents your present attitude or opinion. Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Strongly disagree
2 = Disagree
3 = Neutral/undecided
4 = Agree
5 = Strongly agree
Please indicate, by marking the number on the answer sheet that best represents the degree to which you agree with the following statements:

33. There is a family member who I can talk to about important decisions in my life.
34. Members of my family recognize my abilities and skills.
35. There is no one in my family who shares my interests and concerns.
36. I am very close with at least one other member of my family.
37. There is no one in my family with whom I feel comfortable talking about my problems.
38. I can talk about school issues of concern with a family member.
39. There are family members I can count on in an emergency.
40. Teachers here care about their students.
41. There is a teacher here I can go see to talk about academic problems.
42. Teachers here respect me.
43. Teachers here are interested in my success.
44. There is a teacher here I can talk to about a personal problem.
45. I have friends here at school.
46. There are friends I can talk to about important decisions.
47. There is a friend I can depend on for help.
48. I have no friends I can depend on.
Stress

This section asks about the stresses in your life. Mark the number on the answer sheet that best represents your present attitude or opinion. Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Almost never
2 = Not very often
3 = Somewhat often
4 = Very often
5 = Almost always

Please indicate the degree to which you have experienced each of the following in the PAST MONTH:

49. Difficulty trying to fulfill responsibilities at home and at school.
50. Difficulty trying to meet friends.
51. Difficulty taking tests.
52. Difficulty talking with teachers about schoolwork.
53. A fear of failing to meet family expectations.
54. Difficulty asking questions in class.
55. Difficulty living in the local community.
56. Difficulty understanding how to use the school library.
57. Difficulty handling relationships.
58. Difficulty handling your schoolwork load.
59. Difficulty with classmates treating you differently than they treat each other.
60. Difficulty writing papers for class.
61. Difficulty learning how to use computers.
62. Difficulty paying for school supplies.
63. Money difficulties due to owing money to others.
64. Difficulty paying for food.
65. Difficulty paying for recreation and entertainment.
66. Difficulty due to your family experiencing money problems.
67. Difficulty getting your homework done on time.
68. Difficulty because of feeling a need to perform well in school.
69. Difficulty from teachers.
70. Difficulty from classmates.

Well-being

This section asks you about how often you have had any of these health-related experiences during the past week. Mark the number on the answer sheet that best represents your present attitude or opinion. Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Almost never
2 = Not very often
3 = Somewhat often
4 = Very often
5 = Almost always

Please indicate the degree to which you have experiences each of these during the PAST WEEK:
How often have you experienced…

71. Being tried but unable to sleep.
72. Mood swings.
73. Feelings of danger.
74. Feeling depressed.
75. Feelings of self-doubt.
76. Nightmares.
77. Snacking more than usual.
78. Feeling hopelessness.
79. Sleeping less than usual at night.
80. Getting sick a lot.
81. Overeating.
82. Breaking things when angry.
83. Headaches.
84. Increased heartbeat.
85. Fighting with friends.
86. Feeling “cranky.”
87. Losing your temper.
88. Feeling “jumpy.”
89. Not sleeping well.
90. An upset stomach.
91. Inability to sleep.
92. Increased appetite.
93. Becoming easily upset.

Motivation

This section asks about your reasons for going to school. Different people have different reasons for going to school; we just want to know how much you agree or disagree with each reason given below. Mark the number on the answer sheet that best represents your present attitude or opinion. Remember, this is not a test, and there are no right or wrong answers. The range of answers is:

1 = Strongly disagree
2 = Disagree
3 = Unsure/undecided
4 = Agree
5 = Strongly agree

The reason I keep coming to school is...

94. Because I really enjoy school.
95. Because if I didn’t, I’d feel guilty.
96. So I can make lots and lots of money.
97. Because education is important for the goals I have.
98. So important people in my life won’t be disappointed in me.
99. Because it’s fun.
100. Because I have to; it’s required.
101. Because I don’t want to let others down.
102. Because skills like reading, math, and science are important to me.
103. Because if I don’t, I’ll get punished.

104. Because failing to get my diploma would bother and disappoint me.

105. Because there are a lot of interesting things to do.

106. Because I see the importance of learning.

107. Because, to me, education is important.

108. I wouldn’t be here if I really had a choice about it.
### APPENDIX B

**FACTOR LOADINGS OF SIX NEW RESILIENCE MEASURES CONSIDERED FOR THE MULTIPLE REGRESSION IN THIS STUDY**

*(Based on Principal Components Analysis with Varimax Rotation)*

<table>
<thead>
<tr>
<th>Component</th>
<th>Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Finish school.</td>
<td></td>
<td>.751</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Do well in school.</td>
<td></td>
<td>.788</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Go to college.</td>
<td></td>
<td>.811</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Do well in college.</td>
<td></td>
<td>.828</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Make sure my teacher knows that I want to do well in school.</td>
<td></td>
<td>.664</td>
<td></td>
<td></td>
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<tr>
<td>6. Find out about colleges.</td>
<td></td>
<td>.723</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Learn how to be successful in college.</td>
<td></td>
<td>.827</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Get good grades in school.</td>
<td></td>
<td>.770</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>9. Learn how to be successful in school.</td>
<td></td>
<td>.757</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>10. Get a college degree.</td>
<td></td>
<td>.806</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>33. There is a family member who I can talk to about important decisions in my life.</td>
<td></td>
<td></td>
<td>.781</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34. Members of my family recognize my abilities and skills.</td>
<td></td>
<td></td>
<td></td>
<td>.693</td>
<td></td>
<td></td>
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<td>36. I am very close with at least one other member of my family.</td>
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<td>38. I can talk about school issues of concerns with a family member.</td>
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<td>39. There are family members I can count on in an emergency.</td>
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<td>49. Difficulty trying to fulfill responsibilities at home and at school.</td>
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<td>51. Difficulty taking tests.</td>
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<td>52. Difficulty talking with teachers about schoolwork.</td>
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<td>53. A fear of failing to meet family expectations.</td>
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<td>54. Difficulty asking questions in class.</td>
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<td>58. Difficulty handling your schoolwork load.</td>
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<td>60. Difficulty writing papers for class.</td>
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<td>67. Difficulty getting your homework done on time.</td>
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<td>68. Difficulty because of feeling a need to perform well in school.</td>
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<td>Component</td>
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<td>62. Difficulty paying for school supplies.</td>
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<td>63. Money difficulties due to owing money to others.</td>
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<td>64. Difficulty paying for food.</td>
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<td>65. Difficulty paying for recreation and entertainment.</td>
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<td>66. Difficulty due to your family experiencing money problems.</td>
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<td>72. Mood swings.</td>
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<td>73. Feelings of danger.</td>
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<td>74. Feeling depressed.</td>
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<td>75. Feelings of self-doubt.</td>
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<td>78. Feeling hopelessness.</td>
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<td>82. Breaking things when angry.</td>
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<td>83. Headaches.</td>
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<td>84. Increased heartbeat.</td>
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<td>85. Fighting with friends.</td>
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<td>86. Feeling “cranky.”</td>
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<td>87. Losing your temper.</td>
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<td>88. Feeling “jumpy.”</td>
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<td>90. An upset stomach</td>
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<td>93. Becoming easily upset.</td>
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<td>94. Because I really enjoy school.</td>
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<td>97. Because education is important for the goals I have.</td>
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<td>99. Because it’s fun.</td>
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<td>102. Because skills like reading, math, and science are important to me.</td>
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<td>105. Because there are a lot of interesting things to do.</td>
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<td>106. Because I see the importance of learning.</td>
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<td>107. Because, to me, education is important.</td>
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Factor loadings < .35 are suppressed.
## APPENDIX C

NEW SUB-SKILLS, QUESTION NUMBERS, AND RELIABILITY VALUES

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<thead>
<tr>
<th>New Sub-Scale</th>
<th>Items</th>
<th>Reliability</th>
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<tbody>
<tr>
<td>Money Difficulties</td>
<td>questions 62, 63, 64, 65, and 66</td>
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<td>Ability to Perform in School</td>
<td>questions 49, 51, 52, 53, 54, 58, 60, 67, and 68</td>
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<td>Education</td>
<td>questions 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10</td>
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<td>Teacher Connections</td>
<td>questions 40, 41, 42, 43, and 44</td>
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<td>Family Connections</td>
<td>questions 33, 34, 36, 38, and 39</td>
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<td>Family Connections group 2</td>
<td>questions 35 and 37</td>
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<td>Peer Connections</td>
<td>questions 45, 46, and 47</td>
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<td>Bad Feelings</td>
<td>questions 72, 73, 74, 75, 78, 82, 83, 84, 85, 86, 87, 88, 90, and 93</td>
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<td>Academic Confidence</td>
<td>questions 13, 16, 19, 20, 24, 29, and 30</td>
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<td>Intrinsic Motivation</td>
<td>questions 94, 97, 99, 102, 105, 106, and 107</td>
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<td>Extrinsic Motivation</td>
<td>questions 98, 100, 101, and 103</td>
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<td>Sleeping Problems</td>
<td>questions 71, 79, 89, and 91</td>
<td>0.890</td>
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<tr>
<td>Eating Problems</td>
<td>questions 77, 81, and 92</td>
<td>0.806</td>
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