ELEMENTARY STUDENT ENGAGEMENT: MEASUREMENT, ASSOCIATIONS, AND 
IMPLICATIONS FOR DROPOUT PREVENTION 

by 

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(Under the Direction of Amy L. Reschly) 

ABSTRACT 

There is little contention that student dropout is a pervasive and deleterious force 
affecting the U.S. educational system. In response to this crisis, dropout prevention and 
intervention have become salient focal points. Over the past 30 years, student engagement has 
arisen as a heuristic for conceptualizing early withdrawal and developing dropout prevention and 
intervention practices. This dissertation serves two purposes. First, a literature review detailing prior 
research regarding the conceptualization of the engagement construct, correlations between student 
engagement and dropout, and the importance of early intervention for students at-risk for 
disengagement is provided. Available measures of student engagement are then reviewed as well as 
associated limitations, practical applications, and directions for future research. Second, an empirical 
study examining the psychometric and measurement invariance properties of the Student 
Engagement Instrument- Elementary Version (SEI-E) is presented. Findings and implications for 
practice are discussed. Current results provide burgeoning evidence towards using scores obtained 
from the SEI-E as a valid indicator of the affective and cognitive engagement of upper elementary 
aged students. 

INDEX WORDS:  Student engagement, Dropout, SEI, Elementary age students
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DEDICATION

To those who paved the way so that my dreams may come to fruition; I am eternally grateful. To my family, who instilled my determination to strive for excellence; I hope I have made you proud. To my friends, who motivated me, kept me sane, and reminded me to enjoy the journey; mission accomplished.
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CHAPTER 1

INTRODUCTION

Commonly referred to as the “dropout crisis,” the phenomena of early school withdrawal is a subject of surmounting interest to educational researchers, policy-makers, and the media alike. Concern is appropriately justified as statistics suggest that the United States’ educational system is failing a significant portion of students. Recent data from the National Center for Educational Statistics (NCES) indicate that approximately 7.4 percent of students were classified as noncompleters, as defined by status dropout rates (i.e., individuals ages 16-24 who are not currently enrolled nor earned a General Equivalency Degree or diploma), during the 2009-2010 school year (U.S. Department of Education, 2012). Such statistics are alarming due to the host of undesirable outcomes (e.g., underemployment, incarceration) and societal costs (e.g., providing financial assistance) associated with dropout (Kirsch, Braun, Yamamoto, & Sum, 2007).

With the aim of increasing school completion rates, researchers across a multitude of disciplines have posited various theoretical models in an effort to explain why some students leave school prior to earning a diploma. In the midst of this endeavor, student engagement has arisen as a promising heuristic for understanding dropout and promoting high school completion (Appleton, Christenson, Kim, & Reschly, 2006; Christenson et al., 2008; Finn, 1989; Reschly & Christenson, 2006a). Engagement has also become the proverbial cornerstone of high school reform efforts and dropout prevention programs (Christenson et al., 2008; Reschly & Christenson, 2012). The proliferation of student engagement research over the past three decades has been quite fruitful as it has provided a plethora of information. Researchers have
contributed to a better understanding of dropout by identifying demographic characteristics of noncompleters, pinpointing alterable variables predictive of dropout, and delineating how differences in engagement levels affect the trajectories of students who dropout.

Although the engagement construct is a promising heuristic, issues related to definitional clarity and measurement remain unresolved (Appleton et al., 2006; Betts, 2012, Reschly & Christenson, 2012; Samuelson, 2012). A cogent and coherent operational definition of engagement remains elusive due to the lack of consensus regarding the number of factors underlying engagement (Reschly & Christenson, 2012). The inconsistency in terminology used to define the construct further muddles the waters when attempting to develop a parsimonious conceptualization of engagement (Appleton, Christenson & Furlong, 2008; Reschly & Christenson, 2012).

In an attempt to assuage the discord in the defining the construct, a number of sub-scales and measures have been developed to try to capture student engagement (Fredericks & McColskey, 2012). The recent flourishing of engagement measures has contributed greatly to elucidating the construct; however, it has not been without limitations. There is considerable variability between available scales, making the goal of comparing findings across studies difficult at best (Fredericks, et al., 2011; Fredericks & McColskey, 2012). For example, instruments may differ in terms of whether engagement is examined in its entirety or focused on a specific sub-construct, how many sub-constructs of engagement are measured, the source of the data (e.g., student report, observation, teacher report), and item content (Reschly & Christenson, 2012). As such, synthesizing research and making summative statements about the construct has been a formidable challenge.
In a similar limitation, relatively few measures have been designed to examine student engagement during the formative years of education (Fredericks & McColskey, 2012). Under the premises that 1) early behavioral and academic interventions are efficacious (e.g., Ramey & Ramey, 1998), and 2) the dropout process commences in early elementary school (Finn, 1989), such a modicum of early engagement measures is likely problematic. According to Finn’s seminal participation-identification (PI) model (Finn, 1989) students who experience early success (e.g., academic achievement, teacher attention) following participatory behaviors are placed on a trajectory towards establishing a sense of belonging in the school environment (i.e., identification with school). This sense of belonging is a protective factor against early school departure; however, students who are alienated, marginalized, and do not identify with schooling are at risk for disaffection, a frequent precursor to dropout (Finn, 1989, 1993). Presuming that these theories hold true, measuring student engagement as early as possible may bolster the efficacy and effectiveness of dropout prevention and intervention endeavors. Instruments designed to tap into engagement are also needed to facilitate longitudinal designs, thereby allowing identification of possible developmental changes in the construct (Betts, 2012; Fredericks & McColskey, 2012; Wylie & Hodgen, 2012).

In the interest of addressing the aforementioned limitations, the Student Engagement Instrument (Appleton et al. 2006), commonly referred to as the SEI, was designed to assess cognitive and affective engagement from the student perspective. The scale was developed based on the four-part typology (i.e., cognitive, behavioral, affective, and academic) of student engagement as conceptualized by Christenson and colleagues (e.g., Appleton et al., 2006, 2008; Christenson & Thurlow, 2004; Christenson et al., 2008; Reschly & Christenson, 2012). To date, several studies have examined the psychometric properties of the measure (e.g., Appleton et al.,
2006; Betts, Appleton, Reschly, Christenson & Huebner, 2010; Betts, 2012; Lovelace et al., 2013) and use of the SEI is widespread in districts across the U.S. (Reschly et al., 2013). Overall, there is burgeoning evidence supporting the utility of the instrument.

Fitting with the emphasis on early identification, recent efforts were undertaken to extend the SEI downwards, creating a measure of cognitive and affective engagement for use with upper elementary students (grades 3-5). Referred to as the SEI-E, the Student Engagement Instrument-Elementary Version, was piloted with third through fifth graders from a large urban school district (Carter, Reschly, Lovelace, Appleton, & Thompson, 2012). The SEI-E was constructed based on the four-part typology of engagement, item content, and validation processes utilized in the original Student Engagement Instrument (Appleton et al., 2006).

Initial examination of the SEI-E’s psychometric properties (Carter et al., 2012) suggested that a four-factor model Teacher-Student Relationships [TSR], Peer Support for Learning [PSL], (Future Goals and Aspirations [FGA], and Family Support for Learning [FSL]) most appropriately conceptualized early student engagement. These results are discrepant from previous investigations (e.g., Appleton et al., 2006; Betts et al., 2010; Lovelace et al., 2013) in which five- or six-factor models were determined as best fit for SEI data. Such disagreement engenders the need for further research to clarify the latent structure of early student engagement and whether it differs from later representations (i.e., five and six-factor heuristics identified with middle and high school students). Although preliminary evidence has been established regarding the utility of SEI and SEI-E, additional inquiry is needed regarding the validity of these measures, as instrument validation is an iterative and ongoing process.

The remaining chapters of this dissertation will provide a summary of relevant research informing the theory, purpose, and implications of the current study via review of the literature
as presented in Chapter 2. Chapter 3 will then present the rationale for, and discussion of, the current research questions. A detailed discussion of the current research design and analysis logic will also be put forth. Chapter 4 will present the results of the study and provide overall summary of findings. Lastly, Chapter 5 will serve as a unifying body for the dissertation presenting the overarching themes and conclusions from the study as well as associated limitations, practical implications, and directions for future research.
CHAPTER 2

REVIEW OF THE LITERATURE

The goals of this literature review are threefold. First, a historical summary of the dropout phenomena and review of relevant research will be presented. Particular emphasis will be placed on the importance of early identification of students at risk for disengagement and prevention strategies. Second, the theoretical origins and contemporary conceptualization of the student engagement construct will be discussed. The third section puts forth a summary of current student engagement measures, associated limitations, and directions for future research. This literature review aims to highlight the chasm between research suggesting the efficacy of early dropout identification and the modicum of valid measures assessing student engagement during early elementary school. The scarcity of self-report instruments designed to measure engagement during early elementary school presents a challenge due to prevailing theory that trajectories towards dropout commences during the formative years of schooling.

The State of the Union

Characterized as a “silent epidemic,” the national crisis of high school dropout is well documented. According to a recent national report from Education Week and the Editorial Projects in Education (EPE) Research Center, three out of every 10 students fall through the proverbial cracks in America’s educational system. This amounts to a staggering 1.3 million students per year (7,200 students per day) who drop out of school and are, therefore, failed by the education system (Education Week, 2010).
When viewed within a historical context, a recent review of graduation rates revealed several astonishing trends. After accounting for variance in definitions and calculation methods, a consensus was reached that achieving the goal of ensuring that the entirety of America’s children graduate is further away than previously thought (Heckerman & LaFontaine, 2010). The current national graduation rate of 77% suggests that such conclusions are, unfortunately, accurate appraisals of America’s educational system. As detailed below, the rising trend in dropout (Alliance for Excellent Education [AEE, 2009]) is contraindicated due to the plethora of negative consequences associated with early school departure.

**Consequences of Dropout**

Dropping out of school is a costly outcome accompanied by significant individual and societal consequences. Compared to high school graduates, the prognosis for dropouts is relatively bleak (Kirsch et al., 2007, Rumberger, 2001). Regarding economics, individuals who drop out of school earn lower wages and experience higher rates of unemployment and underemployment relative to their counterparts who graduated or earned a General Equivalence Diploma (Kirsch et al., 2007; U.S. Department of Education, 2012). The NCES, for example, estimated that dropouts will earn approximately $8,000 less than high school graduates each year (U.S. Department of Education, 2012). This translates to a difference of nearly 28% in median annual earnings (Rumberger & Rotermund, 2012). Such impediments to financial security have far-reaching consequences for dropouts and their families, particularly during periods of economic instability.

Due to financial constraints, individuals who drop out of school may find themselves unable to provide their families with basic needs such as nutritious food, safe homes in suitable neighborhoods, and adequate healthcare (Currie, 2009; Kirsch et al., 2007). Dropout not only
affects the individual, but bears negative consequences on the future generation (Kirsch et al., 2001; Rumberger, 2001). The financial implications of dropout suggest that children with parents who fail to earn a high school diploma may be placed at greater risk for health problems. Research (e.g., Currie, 2009; Evans, 2004) suggests that child health is correlated with parent socioeconomic status (SES) such that poorer children experience more health problems and physical insults than children with more affluent parents. Specifically, correlations have been found between low parental SES and increased rates of inadequate nutrition (Alaimo, Olson, & Frongillo, 2001), lead exposure (Evans, 2004), asthma (Currie, 2009), and other chronic health problems. Such evidence would suggest that dropping out of school bears consequences for multiple parties.

Research suggests that some populations are at a greater risk of dropping out than others (Appleton & Lawrenz, 2011; Heckerman & LaFontaine, 2010; Reschly & Christenson, 2006b). Ethnic minority students, for example, are more likely to dropout than White students. Using data collected from state departments of education and U.S. Census information, Heckerman and LaFontaine (2010) estimated that 81% of White students graduate from school, while only 66% and 63%, of African American and Hispanic students, respectively, leave school with a diploma. Similarly, students with high incidence disabilities dropout at a significantly higher rate than typically developing peers and comparatively experience bleaker life outcomes after dropping out (Archambault & Janosz, 2009; Reschly & Christenson, 2006b). Such evidence suggests that some populations are especially susceptible to high school dropout and differentially effected by the consequences thereof.

Although the individual costs of dropout are numerous, the effects of early school withdrawal extend far beyond dropouts themselves. The societal costs and financial impact of
non-graduates are evident within the economic and educational literature (Archambault & Janosz, 2009; Kirsch et al., 2007; Rumberger & Rotermund, 2012). For example, individuals who drop out earn lower wages, pay fewer taxes, and make smaller contributions to local, state, and national economies (Rumberger & Rotermund, 2012). The United States government utilizes considerable funding, approximately 76 billion dollars (annually), providing for dropouts and their families (Kirsch et al., 2007). A recent study estimated that each additional graduate would generate more than $200,000 in government funds (Belfield & Levin, 2007). Halving the dropout rate from a single cohort of dropouts would generate more than $45 billion dollars in available funds for the economy (Belfield & Levin, 2007). Such a surplus of funds would be invaluable to the economy, particularly during the current economic recession.

As a barometer of the health of American society, the high school graduation rate provides an indicator of the preparation and skill level of the future workforce (Heckerman & LaFontaine, 2010). High dropout rates indicate that a significant portion of the nation will likely be unable to compete in the ever-changing global economy with the rising standards of educational attainment (Kirsch et al., 2007). As a result, nation’s economy and competitive standing suffer in the face of high dropout rates.

The impact of dropout on global competitiveness is apparent in the 2012-2013 Global Competitiveness Report (GCR). Compiled yearly by the World Economic Forum, the GCR provides a description a nation’s economic competitiveness (Global Competitive Index- GCI) based on twelve standards (e.g., adequate primary education, higher education and training). Data suggests that the competiveness of the U.S. Economy is steadily diminishing. In 2008, the United States’ economy was ranked number one; however, the GCI for the 2011-2012 declined significantly, falling four rankings to fifth place. The current GCI for the U.S. economy is
currently in seventh place, highlighting the declining financial health and competitiveness of the country in only one year’s time (World Economic Forum, 2012).

Dropout also impacts the U.S. economy due to the probability that noncompleters may be relegated to dependence on government assistance programs (e.g., welfare) as a result of their inability to compete in the national job market (AEE, 2009; Kirsch et al., 2007). Such dependence requires additional resources from the United States government and further reduces the overall productivity of the U.S. citizenry and the economy (Kirsch et al., 2007). Overall, one might reach the conclusion that early school departure has undesirable implications for the individual, their family, and the society as a whole.

The negative consequences of dropout have prompted considerable inquiry into the phenomena of early school withdrawal (Reschly & Christenson, 2006a; Rumberger, 1987; Rumberger, 2001). Understanding the contributing factors to student dropout is critical to designing effective interventions (Christenson & Thurlow, 2004; Davis & McPartland; 2012); yet identifying the causes and processes of dropout has proved difficult. A brief literature review of initial research on dropout followed by contemporary methods for examining dropout is presented herein.

**Dropout Research: Past and Present Conceptualizations**

Interest in student dropout dates back to the early 1900s during which researchers expended significant energy identifying characteristics of noncompleters (Barclay & Doll, 2001). The majority of these descriptive studies focused on demographic variables (e.g., race, ethnicity, socioeconomic status) and immutable individual differences (e.g., cognitive functioning) associated with increased risk for early school departure (Barclay & Doll, 2001). Although most dropout literature focuses on status variables associated with dropout, socio-demographic factors
alone do not fully account for dropout risk and identifying such indicators has limited utility (Rumberger & Lim, 2008; Reschly & Christenson, 2006b).

Although early research on dropout provided the impetus for examining school withdrawal, extensive focus on demographic risk confers few benefits to educational researchers and interventionists. Identifying risk status via demographic variables provides minimal insight regarding why certain subsets of students “at risk” for dropout leave school prior to graduation though others do not. Furthermore, many of these variables are immutable and therefore not conducive to intervention. Fortunately, it is now commonly accepted that additional factors such as early school experiences (e.g., grade retention, special education status, reading ability), student behavior (e.g., school absences, tardies, classroom conduct), and personal resources (e.g., locus of control, academic self-efficacy, satisfaction with school) are also significant, and potential useful, predictors of early school departure (Alexander, Entwistle, & Horsey, 1997; Archambault & Janosz, 2009). Current dropout research has described other distinctions among alterable variables predictive of dropout and completion that may better inform prevention and intervention (Christenson et al., 2008; Reschly & Christenson, 2012).

Functional risk and other mutable dropout variables (e.g., student engagement) are frequently categorized by contexts (i.e., family, school, or peer related) and proximity (e.g., early educational experiences, attendance, homework completion). Distinctions can also be made between risk and protective factors (Reschly & Christenson, 2006b) such that risk factors are behaviors or experiences that increase the likelihood of dropout, whereas protective factors help safeguard against early school withdrawal (Reschly & Christenson, 2006a). The distinction between push and pull (e.g., pregnancy, supporting family members) factors is another critical component when conceptualizing dropout (Jordan, McPartland, & Lara, 1996). Research
suggests that inhospitable school-related factors, such as strained teacher-student relationships, harsh discipline policies, and curricula with little real-life relevance (push factors) often provide the catalyst for dropout (Reschly & Christenson, 2006a). The alterable nature of school-level push factors may provide opportunities for system-wide reform to improve the educational policies and practices that so often encourage students to drop out.

When attempting to understand why students drop out, it is best to conceptualize dropping out as a developmental process that concludes with the student’s decision to leave school (Finn, 1989, 1993). Various models of dropout have been put forth in the literature to explicate the reasons why some students choose to leave school prematurely (Janosz, Archambault, Morizot, & Pagani, 2008; Rumberger & Rotermund, 2012). Finn’s PI model, a heuristic that is commonly used as a starting point for conceptualizing dropout, is presented in the following section. The discussion will culminate with a brief review of student engagement, a promising construct for conceptualizing dropout, formulating intervention and prevention practices, and developing school reform efforts (Christenson et al., 2008; Fredericks & McColskey, 2012; Reschly & Christenson, 2006; Reschly & Christenson, 2012).

**Conceptual Models of Dropout and Engagement**

Numerous conceptual models (e.g., life course models, Tinto’s model, Connell and Wellborn’s self-systems model) of dropout have been put forth in the educational and psychological literature. According to Rumberger and Rotermund (2012), most paradigms focus on an array of factors thought to contribute to the complex process of dropout. Early school experiences, prior school performance (e.g., grades, test scores), academic behaviors (e.g., homework completion), social behaviors (e.g., getting along with peers), and affective conditions (e.g., identification with school) are but a few variables associated with dropout (Finn, 1989;
Finn, 1993; Finn & Zimmer, 2012). The interplay between these variables is complicated, at best. A comprehensive review of dropout models is beyond the scope of this paper. As such, discussion will be limited to Finn’s (1989) PI model and the construct of student engagement as they are both commonly used as heuristics for conceptualizing dropout.

In his seminal paper, Finn (1989) proposed two alternative developmental models to delineate the process of dropout. Both paradigms included three components: school performance, behaviors, and psychological conditions; however, the models differed with respect to the emphasis on specific psychological and behavioral factors. Finn’s first heuristic, the “frustration-self-esteem” model posited that school withdrawal commences with early school failure (e.g., reading difficulties), which, in turn, fosters low self-esteem followed by problem behaviors (e.g., truancy, disruptive behavior). These problem behaviors lead to further deterioration of academic performance, which then results in further declines in self-esteem and increases in maladaptive behaviors. Inevitably, students are either forcibly removed (i.e., expelled, placed in alternative settings) from school due to negative behavior or leave school voluntarily due to low self-efficacy (Finn, 1989). Within this model, self-esteem and problem behaviors play a central role in the dropout process.

Although Finn proposed the frustration-self-esteem model, he later dismissed this heuristic due to the surmounting body of research supporting the importance of behavioral participation and feelings of belonging within the school environment. According to Finn’s Participation- Identification (PI) model, engagement is best conceptualized via the interplay between behaviors and affect. The behavioral component (participation) refers to basic learning behaviors (e.g., work completion, volunteering to respond to teacher questions), initiative taking behaviors (e.g., surpassing minimal expectation), social behaviors (e.g., interacting positively
with peers and teachers, positive conduct) and engaging in extracurricular activities. The affective component (identification) refers to students’ perceived sense of inclusion and belonging within the school environment (Finn, 1989). Within the PI model, feelings of belonging and participation are inextricably linked such that “bonding” with the school environment fosters positive social and academic behaviors. Finn (1989, 1993) emphasized the developmental nature of engagement as student levels of participation and identification vary over time with changing expectations in the school environment.

During early elementary school, participation may be little more than passive acquiescence to school rules such as arriving to school on time, completing required assignments, and complying with teacher requests (Finn, 1989). Students who demonstrate these “level-one” participatory behaviors receive positive feedback from the academic environment (e.g., teacher praise, academic success) which bolsters their sense of identification with school and perceived value of education (Finn, 1989). Successful participation during early grades requires minimal effort on the part of the student (Finn, 1989; Finn & Zimmer, 2012); however, as students progress, requirements and opportunities for participation become more stringent and complex.

Finn described individuals who successfully go beyond minimal academic/behavioral requirements as demonstrating “level two” participatory behaviors. Such behaviors include initiating teacher questions, displaying enthusiasm for schooling, and completing more work than required. Students who demonstrate advanced participatory behaviors receive additional positive feedback, which often evolves into participation in extracurricular and community activities (Finn, 1989). These positive early educational experiences place students on a
trajectory towards developing further participatory behaviors and identification with school, thereby beginning the cycle of engagement (Finn, 1989, 1993).

According to this model, early school achievement and behaviors are important contributing factors to academic success (Finn, 1993). The school context must consistently provide opportunities for participation, a rich schedule of reinforcement, and success experiences to foster the affective connection needed to maintain student involvement in the educational process (Finn & Zimmer, 2012). Not all students, however, experience subjective identification with the school environment or participate actively in academic settings. Students who demonstrate non-participatory behaviors (e.g., avoiding teacher attention, unpreparedness) are less likely to experience successful school outcomes (Finn, 1993). Instead, these students are faced with an increased risk for disengagement. Although layperson often conceptualize dropout as a single event in which the student decides to no longer attend school; The PI model defines dropout as the gradual process by which students become disaffected with the school environment that culminates in the decision of early withdrawal (Finn; 1989).

Disengagement may be detected as early as first grade by examining student absences, truancy, and delinquent behaviors that often indicate disengagement (Alexander et al., 1997; Barrington & Hendricks, 1989). Such physical withdrawal leads to unsuccessful school outcomes (e.g., failing grades, negative teacher attention), which thereby engenders non-identification, or emotional withdrawal (Finn, 1993). Experiencing physical and emotional withdrawal frequently serves as the impetus for the path towards dropping out of school prior to receiving their diploma (Finn, 1989, 1993, 2006). The following section will discuss various longitudinal studies that have examined various dropout trajectories and illuminated the reasons why some students drop out of school yet others do not.
Pathways to Dropout

The link between disengagement and dropout is well-established within the research (Finn, 1989, 1993; Finn & Rock, 1997; Finn & Zimmer, 2012; Rumberger & Rotermund, 2012). As such, systematic focus on patterns of student engagement may provide schools with a viable method for assessing how invested their students are in the educational process (Wylie & Hodgen, 2012). Examining engagement patterns also allows researchers to understand the complex interplay between student contexts, engagement trajectories (i.e., pathways of engagement), and student outcomes (Janosz et al., 2008; Rumberger, 2001).

With the aim of elucidating pathways to dropout, Janosz, Archambault, Morizot, and Pagani (2008) used two analyses of a longitudinal dataset to investigate engagement trajectories. Analyses revealed seven different pathways, three of which were relatively stable. Findings suggested that students with unstable engagement levels during adolescence and those who experienced low levels of engagement at age twelve were most likely to dropout as 42% of students in this group left school prior to graduation (Janosz et al, 2008). The authors suggested that differences in engagement trajectories were related to the match between individual characteristics, the family, and school contexts.

To further understand the development of student engagement and the role of school context, Wylie and Hodgen (2012) utilized the Competent Learners Study, a longitudinal data set from New Zealand, to track student engagement levels relative to student competencies, extracurricular activities, and learning opportunities. This study expanded upon previous research by broadening the age-range of the sample used in the Janosz et al. 2008 study. Analysis of the data indicated that student engagement decreased over time for the sample as a whole.
Researchers further concluded that the majority of engagement decline occurred between ages 10 and 14 (Wylie & Hodgen, 2012).

Regarding specific trajectories of engagement, Wylie and Hodgen (2012) found nine discernible engagement patterns. Thirty percent of the sample demonstrated stable levels of student engagement with 17% of the students exhibiting consistently high levels of engagement and 13% showing consistently low engagement levels. Intermediate patterns were also found with some students demonstrating variability around moderate levels of engagement (21%), while others showed decreases in engagement (24%). The remainder of the sample (26%) exhibited variable engagement or increases in engagement over time (Wylie & Hodgen, 2012).

With regard to individual differences, Wylie and Hodgen (2012) uncovered several characteristics that correlated with student engagement patterns. Students with high engagement experienced early enjoyment with school, had above average scores on competency tests (at age 10), and reported higher motivation levels as measured by student responses to motivational items included in the Competent Learners Study survey (Wylie & Hodgen, 2012). The authors concluded that there were five discernible patterns of engagement with almost linear relationship between the engagement trajectories and academic outcomes. In other words, competency levels and post-secondary enrollment correlated, as expected, with varying levels of student engagement (e.g., students with consistently ‘high’ engagement demonstrated higher competency on cognitive and attitudinal measures). Such longitudinal studies emphasize that although earlier patterns of engagement do contribute to later patterns, student engagement levels are responsive to changes in learning opportunities and effective interventions (Finn & Zimmer, 2012; Wylie & Hodgen, 2012).
Importance of Early Identification

Early intervention programs, defined as services and activities designed to enhance children’s cognitive, social, and academic experiences (Ramey & Ramey, 1998), have demonstrated effectiveness in improving positive outcomes for students placed at-risk (National Research Council and Institute of Medicine, 2000). Evidence from longitudinal studies (e.g., Campbell, Pungello, Miller-Johnson, Burchinal, & Ramey, 2001; Schweinhart, 2005) revealed reductions in special education referrals and placement, grade retention, and suspension for students who participated in early interventions such as the Perry Preschool Project and the Abecedarian Project. When compared to the control group, students who participated in early intervention services experienced more positive outcomes (at age 40) such as lower rates of lifetime arrests and higher employment and graduation rates relative to the control sample (Schweinhart, 2005).

Under the premise that early and intensive intervention is effective, detecting students at risk for dropout early in their academic careers may be preferable to facilitate timely delivery of appropriate and intensive intervention (Carter et al., 2012; Finn & Zimmer, 2012). Using predictors of dropout such as assignment completion, school attendance, and disruptive behavior, several prospective (e.g., Cairns, Cairns, & Neckerman, 1989) and retrospective studies (e.g., Barrington & Hendricks, 1989; Cairns et al., 1989; Garnier, Stein, & Jacobs, 1997) have identified students who are either at risk for dropping out or have already done so. Barrington and Hendricks (1989), for example, used third grade school attendance records and achievement test scores to identify students who eventually dropped out with 70% accuracy. Similar studies (e.g., Alexander et al., 1997) suggest that early engagement indicators are potent predictors of dropout and may be identified as early as first grade.
Overall, research suggests that early indicators of engagement (e.g., disciplinary infractions, homework completion, sense of affiliation) are predictive of dropout trajectories and engagement patterns throughout education (Alexander et al., 1997; Barrington & Hendricks, 1989; Finn & Zimmer, 2012; Wylie & Hodgen, 2012). A review of longitudinal studies identified student engagement, particularly behavioral engagement, as a potent predictor of persistence (Rumberger & Lim, 2008), achievement in later grades, and postsecondary outcomes such as completion of a postsecondary program (Finn, 2006; Finn & Zimmer, 2012). The malleability of student engagement is an attractive feature of the construct, and early examination of engagement may play an important role in intervention efforts to curtail dropout (Finn & Zimmer, 2012).

The above sections reviewed the consequences of dropout, models for conceptualizing early withdrawal, and research examining the connection between student engagement and trajectories of academic performance. To provide further context of the relationship between student engagement and dropout, the following section will discuss conceptual development of engagement construct, methods for measuring student engagement, and directions for future research. Emphasis will be placed on the need for early measurement of engagement in light of the common assumption that engagement (and disengagement) trajectories commence during early education.

**Student Engagement as a Heuristic for Conceptualizing Dropout**

**The Student Engagement Construct**

Over the past twenty-five years, educational and developmental psychology researchers and practitioners have paid increasing attention to the construct of student engagement. Although ameliorating the dropout crisis and promoting school completion is one of the central practical
applications (Christenson & Thurlow, 2004; Christenson et al., 2008), student engagement is no longer just of interest in relation to dropout (Reschly & Christenson, 2012). As a relevant construct for all students, engagement is associated with a host of student competencies (e.g., academic achievement, social/emotional well-being) and long-term outcomes such as educational attainment and work success (Christenson, Reschly, & Wylie, 2012). With this in mind, the goal of broadly increasing student competencies has remained a central tenet throughout the study of engagement (Reschly & Christenson, 2012).

To provide the appropriate conceptual lens through which to view engagement, this section will, first, provide a brief description of the historical context and impetus for initial interest in the engagement construct. The development of the construct and changes in how engagement has been conceptualized over time (e.g., changes in definitions, models, relationships between sub-constructs) will then be discussed. Lastly, contemporary definitions of engagement, including consensus and areas of divergence will be highlighted.

Initially conceptualized by scholars and researchers during the 1980s, student engagement (and disengagement) was first posited as a way to understand and ameliorate student boredom and alienation (Finn, 1993; Finn & Zimmer, 2012). At this time, engagement was defined according to various models, which may be differentiated along two major heuristics and orientations: Self-systems processes and Participation- Identification (Finn, 1989).

Connell and Wellborn’s (1991) self-systems processes model highlighted the role of intrapersonal dynamics based on the supposition that all individuals have the “basic need” for autonomy, competence, and relatedness (Connell, 1990; Connell & Wellborn, 1991). During an ongoing activity, we constantly form appraisals, evaluating whether these needs are being met based on our interaction with others and the environmental context. Unmet needs may result in
internal adjustments, either in a positive (engagement) or negative (disaffection) manner (Connell & Wellborn, 1991). Under this paradigm, higher levels of engagement and academic success are found in school environments that foster student competence (e.g., well-developed reading skills), autonomy (e.g., intrinsic interest, independent learning), and relatedness (e.g., teacher-student relationships). A relationship between self-system processes and academic achievement has been demonstrated in several empirical studies with elementary (Klem & Connell, 2004; Patrick, Skinner, & Connell, 1993), middle, and high school (Connell, Spencer, & Aber, 1994) students, providing evidence towards the validity of this model.

Finn’s (1989) seminal PI model is frequently utilized as a starting point for student engagement models. Featuring both intrapersonal and contextual views, this model explained how participatory behaviors (e.g., paying attention, asking questions, following school rules) and affect (e.g., sense of affiliation, inclusion in the school environment) interact to impact the likelihood of engagement, academic success, and high school graduation (Finn & Rock, 1997; Finn & Zimmer, 2012).

Various researchers have expanded upon the heuristics of Finn as well as Connell and Wellborn by positing a variety of two, three, and four-part models of engagement (Appleton et al., 2006; Betts, 2010; Betts, 2012; Fredericks & McColsky, 2012). Scholars, however, have agreed that engagement is minimally comprised of two sub-constructs: behavioral and affective. Behavioral engagement refers to a student’s involvement in academic and extracurricular activities. Indicators such as time on task, school attendance, and homework completion are considered to be manifestations of behavioral engagement (Appleton et al., 2006; Finn, 1989; Fredericks et al., 2004). Affective engagement is comprised of positive and negative interactions between classmates, teachers, and school and feelings of identification or belonging with schools.
Factors such as interest in learning and valuing education are thought to be indicative of cognitive engagement (Christenson et al., 2008; Finn, 1989; Fredericks et al., 2004).

Other researchers have outlined a three component model that includes behavioral, emotional (affective), and cognitive dimensions (Fredericks et al., 2004; Jimerson et al., 2003; Wigfield et al., 2008). Cognitive engagement is defined as a student’s level of investment in learning and includes cognitive activities such as self-regulation, problem-solving, strategic thinking, and willingness to exert the necessary effort to master difficult skills (Fredericks et al., 2004). Finally, Christenson and colleagues (Appleton et al., 2006; Christenson et al., 2008; Reschly & Christenson, 2006a) hypothesized a four-part typology of student engagement consisting of academic, behavioral, cognitive, and affective components. Within this model, certain facets of behavioral engagement (e.g., work completion) have been separated into the distinct sub-construct of academic engagement.

Although scholars disagree regarding the sub-constructs of engagement, there is a recent consensus that engagement involves aspects of cognitive, affective, and behavioral engagement, at a minimum (Betts, 2012; Finn & Zimmer, 2012; Fredericks et al., 2004; Reschly & Christenson, 2012; Samuelson, 2012). Current conceptualizations of the engagement construct, therefore, integrate and expand upon multiple components of earlier engagement models to address student competencies across relevant behavioral, academic, and social-emotional domains (Reschly & Christenson, 2012).

In summary, most models of engagement examine some aspect of a students’ behavioral, cognitive, and affective engagement with school; however, the manner in which these sub-constructs are defined and organized differ considerably within the literature. Despite the
discordance in defining the construct, consensus has been reached that engagement is 1) multidimensional, 2) essential for learning, 3) developmental in nature, and 4) malleable (Finn & Zimmer, 2012).

**Promise of the Student Engagement Construct**

Student engagement has become a construct of broad appeal with educational researchers (Fredericks et al., 2004; Reschly & Christenson, 2012). During the past twenty-five years, interdisciplinary studies have shed light on the relationships between student engagement and pertinent educational processes and outcomes (Finn & Zimmer, 2012). One of the most promising facets of the engagement construct is its use as a potential heuristic for conceptualizing early withdrawal from school and formulating dropout interventions (Christenson et al., 2008; Reschly & Christenson, 2006; Reschly & Christenson, 2012).

The presumably alterable nature of engagement is another positive feature of the construct. As a mediator between context and environment, engagement provides researchers and interventionists with a link between environmental contexts (e.g., families, schools, communities) and important outcomes (e.g., academic achievement, dropout) that is amenable to intervention (Christenson et al., 2008; Fredericks & Blumenfield, 2004; Reschly & Christenson, 2006a, 2012). By manipulating factors within the school environment and other contexts, interventionists and researchers can target aspects of engagement that are responsive to changes in school and teacher practices (Rumberger, 2001).

Focusing on the construct of engagement also includes the delineation of predictive variables (e.g., push and pull factors) which may potentially facilitate accurate identification of students who are truly placed at risk for dropout (Reschly & Christenson, 2006a). This is preferable to focusing on other indicators of risk status (i.e., demographic or status variables)
which are stable or unlikely to change (e.g., parent SES). Researchers hypothesize that engagement behaviors are observable in similar forms during early and latter years of education (Finn & Zimmer, 2012; Wylie & Hodgen, 2012). The process of disaffection and dropping out school may thereby be examined via longitudinal designs commencing during the formative years of education (Finn & Zimmer, 2012). This may allow for earlier identification of students at risk for dropout, which may prove more effective than intervening later during a student’s education after students have already become entrenched in trajectories towards disengagement.

Another attractive feature of the construct is the premise that behaviors are easily understood by teachers and practitioners as being critical to learning (Appleton et. al., 2006; Christenson et al., 2008; Finn & Zimmer, 2012; Fredericks et al., 2004). Such universal understanding may facilitate the necessary communication between teachers, researchers, interventionists, parents, and other stakeholders. Lastly, empirical research has repeatedly confirmed the relationship between engagement and academic performance (Finn & Zimmer, 2012) which lends additional credibility to engagement as a promising construct. Summarily, focusing on student engagement confers the possibility of improving achievement and attainment by altering the school environment when other characteristics and risk-factors are beyond our control.

**Definitional and Theoretical Issues**

Although student engagement is thought by many to be a promising construct for dropout prevention and high school reform, several conceptual and definitional issues remain (see Christenson et al., 2012). As a relatively nascent concept, student engagement draws from a substantial body of work from other disciplines (Betts, 2012). Naturally, overlap and redundancy exist between the concepts thought to underlie engagement and other psychological constructs
The similarity between engagement and motivation is an oft-cited example and unraveling these constructs remains a challenge (Appleton, Christenson, Kim, & Reschly, 2006; Betts, 2012; Reschly & Christenson, 2012).

There is considerable discord regarding the relationship between motivation and engagement. Some authors (e.g., Appleton et al., 2006; Betts, 2012; Reschly & Christenson, 2012) posit that engagement and motivation are distinct, yet similar, constructs whereas other scholars assert that motivation is a subordinate construct of student engagement (Fredericks et al., 2004). Current conceptualizations argue that engagement represents the behavioral, cognitive, and emotional *expression* of the underlying psychological process of motivation (Betts et al., 2012; Reschly & Christenson, 2012; Skinner, Kindermann, Connell, & Wellborn, 2009).

Although this distinction seems logical, confusion surrounding these constructs is understandable due to shared terminology and conceptual commonality. Some researchers have agreed that motivation is conceptualized as intent, and engagement is based upon action. Confusion comes into play, however, in adding the assumption that engagement is comprised of both underlying internal processes (e.g., intrinsic motivation, self-regulation) and external variables (Reschly & Christenson, 2012). Reschly and Christenson (2012) applied Block’s (Block, 2000) terms of *jingle* (using the same term to refer to different concepts) and *jangle* (referring to the same concept using different terms) to highlight the conceptual and measurement issues with the engagement construct. As an illustrative example the following terms are all used to refer to the study of engagement: student engagement, school engagement, student engagement with school, engagement in school, engagement in schoolwork, and
engagement in class (Fredericks & McColskey, 2012). Definitional confusion, therefore, seems all but certain.

Such divergence in terminology makes it difficult to compare findings across studies (Betts, 2012; Reschly & Christenson, 2012; Samuelson, 2012). As noted by Reschly and Christenson (2012), for example, perceived relevance of school has been conceptualized by some (e.g., Wylie & Hodgen, 2012) as an aspect of motivation, while others (e.g., Finn, 2006) include this concept under the category of affective engagement. Appleton and colleagues (e.g., Appleton et al., 2006; Christenson et al., 2008), on the other hand, characterized utility of school as being subsumed within the construct of cognitive engagement (Reschly & Christenson, 2012). This singular example demonstrates the complexity of engagement terminology used within the literature.

Compounding the definitional clarity issue is a lack of consensus regarding the subconstructs and theoretical models of engagement. Limited agreement exists regarding the inclusion, exclusion, and partitioning of the sub-constructs of engagement (Fredericks & McColskey, 2012; Reschly & Christenson, 2012). Despite conceptual disagreement, a confluence of intervention work and empirical research suggests that behavioral, emotional, and cognitive engagement influence behavioral and academic outcomes (e.g., Connell & Wellborn, 1991; Finn & Rock, 1997; Fredericks et al., 2004; Sinclair, Christenson, Evelo, & Hurley, 1998). Although these studies provide useful correlations and predictive information, several measurement issues must be addressed to fully understand the relationship between engagement, student competencies, and student outcomes (Betts, 2012; Fredericks & McColskey, 2012). For example, the lack of methodologically rigorous empirical research using advanced statistical
analyses is commonly put forth as a significant contributing factor to limitations in measuring engagement.

**Measuring Student Engagement**

Notwithstanding the rich body of literature related to student engagement, advances in measurement methodologies are needed to adequately answer definitional and theoretical questions that have yet to be addressed (Betts et al., 2010; Betts, 2012; Fredericks et al., 2012; Reschly & Christenson, 2012). Accurately measuring the construct is critical as it provides the most appropriate paradigm by which to examine the correlations between engagement, student outcomes, and other educational/psychological variables (Betts, 2012; Samuelson, 2012). Lastly, and perhaps most importantly, psychometrically sound measurement of engagement is a prerequisite before one can place sufficient confidence in research findings by fostering valid interpretation of data (Betts, 2012; Samuelson, 2012).

There is currently discord between researchers regarding the most appropriate data source for assessing student engagement (Appleton et al., 2006; Finn & Zimmer, 2012; Fredericks & McColskey, 2012). Various methods such as observations, teacher rating scales, interviews, and student self-report have been used to measure specific facets of engagement (Fredericks & McColskey, 2012). The sub-construct of engagement being examined typically dictates the type of data that must be collected, thereby informing the most psychometrically sound measurement of the construct (Appleton et al., 2006; Christenson et al., 2008; Fredericks & McColskey, 2012).

Behavioral and academic engagement are readily observable sub-constructs. Therefore direct methods such as examining attendance records, permanent products, and observations may be used (Appleton et al., 2006; Fredericks & McColskey, 2012). Methods for measuring cognitive and affective engagement, however, are not as well-defined. Christenson and
colleagues (Appleton et al., 2006; Christenson et al., 2008; Reschly & Christenson, 2006a, Reschly & Christenson, 2012), for example, surmised that cognitive and affective engagement are internally represented sub-constructs that necessitate student self-report. Other researchers, however, purport that parent and teacher report are valid methods for examining cognitive and affective engagement (Appleton et al., 2006; Fredericks & McColskey, 2012).

As with all research methodologies, there are benefits and limitations associated with each approach for assessing student engagement. Relative strengths and weaknesses are based primarily upon the sub-construct of interest. Observational methods, for example, are frequently utilized at the individual and classroom levels to identify those at risk for disengagement and academic failure (Shapiro, 2004). Similarly, academic engagement is often assessed via momentary time-sampling procedures to record on and off task behavior (Fredericks & McColskey, 2012). One benefit of observational measures is the availability of detailed information regarding the antecedents, behaviors, and consequences that occur within the classroom environment (Fredericks & McColskey, 2012). Such information allows researchers to examine the contextual factors associated with engagement and disengagement. Observational methods are also useful for verifying information gathered via other sources (e.g., teacher report, surveys). Of note, observational methods are not without short-comings. As Fredericks and McColskey (2012) pointed out, observing students is often time consuming and the accuracy and reliability of observation are heavily dependent upon observer training. Issues of observer reactivity and the extent to which observed behaviors generalize across other contexts is also of concern.

Teacher checklists or rating scales are another commonly used method for assessing student engagement. Collecting teacher report information may address some of the
aforementioned limitations of observation by providing valuable insight beyond that of a third-party observer. Rating scales are typically given to someone highly familiar with the students; therefore, the teacher can provide a wealth of past experiences and interactions with the students across multiple contexts within the school environment. Teacher-reports also prove useful when interested in the engagement of younger students for which accurate self-report would be impossible (Fredericks & McColskey, 2012). Empirical research (e.g., Appleton & Lawrenz, 2011; Skinner, Marchand, Furrer, & Kinderman, 2008) has examined the correlations between teacher ratings and student self-report. Stronger correlations have been demonstrated between teacher and student reports of behavioral engagement (externally represented/low inference) than teacher and student reports of affective and/or cognitive engagement (internally represented/high inference) (Appleton & Lawrenz, 2011). Therefore, it follows that teacher ratings may be best utilized with observable facets of student engagement (e.g., behavioral engagement, academic engagement).

Although not used with high frequency, some studies (e.g., Blumenfield et al., 2005) have used semi-structured and unstructured interview techniques to assess student engagement. Interviews are particularly useful because they can provide detailed, qualitative data that, thereby capturing individual variability in engagement (Samuelson, 2012). Data gleaned from interviews may also provide quality insight into the relationship between contextual factors, school experiences, and student engagement as perceived by the student themselves (Fredericks & McColskey, 2012). Social desirability of the respondent as well as knowledge, skills, and biases of the interviewer are the most troublesome limitations of interviewing because they have great impact on the validity and richness of the data (Samuelson, 2012). Coding interviews for use in
qualitative purposes is also a time consuming endeavor that many individuals are unable or unwilling to undertake.

Self-report surveys are the most commonly utilized method to assess student engagement (Appleton et. al, 2006; Betts et al., 2010; Betts, 2012; Carter et al., 2012; Fredericks & McCloskey, 2012). Arguments for using self-report are abundant within the engagement literature. By administering self-report rating scales, researchers are able to collect valuable information from the student perspective. Such data may, otherwise, remain unknown or be misinterpreted using other methods (Appleton et al., 2006). Researchers often use self-report information to supplement pre-existing objective data such as behavioral indicators of engagement (e.g., school attendance, behavior incidences) and teacher reports that are commonly collected in schools (Appleton et al., 2006). Self-report measures may be easily incorporated into classroom practices and are, therefore, widely used within schools due to their practicality and ease of administration (Appleton et al., 2006; Fredericks & McCloskey, 2012). The use of self-report is also advantageous due to their low cost and efficiency as surveys can be administered simultaneously to large samples of students.

While there are many redeeming qualities of self-report, several concerns have been raised within the literature. Factors related to readability, item wording, and sentence structure of self-report items may impact the response accuracy of younger students and students with reading disabilities (Appleton et al., 2006); such issues may, however, be circumvented by through oral administration of surveys. Concern regarding careless responding, response acquiescence and social desirability has also been noted (Fredericks & McColskey, 2012; Samuelson, 2012). For example, students may not answer truthfully if they are not afforded anonymity or if the surveys are administered by a teacher or other influential individual.
Administering surveys class-wide or school-wide may assuage such issues of social desirability bias, response acquiescence, and other limitations associated with self-report. Despite the potential issues associated with measuring the construct, there are a slew of options and scales available for those interested in measuring engagement which are detailed herein.

**Current Measures of Engagement**

As one might expect with the increased interest in student engagement, there has been a recent upsurge in the number of measures purported to assess aspects of the construct. Fredericks and colleagues (Fredericks, et al., 2011; Fredericks & McColskey, 2012; Skinner & Pitzer, 2012) conducted an extensive review of the literature examining scales designed to measure various facets of engagement. After excluding instruments that did not fit inclusion criteria, the literature search resulted in 21 measures that examine the student engagement of early elementary through high school students (Fredericks et al., 2011). Most available measures assess student engagement via self-report; however, a few measures utilize teacher observation or student interviews (Fredericks & McColskey, 2012).

Available instruments vary across several aspects such as the number of constructs theorized to underlie engagement, the method of data collection (e.g., self-report, teacher report), and whether they examine general engagement, engagement sub-constructs, or related constructs (e.g., motivation). Scales also differ in the extent to which the measure adequately examines the multidimensional nature of engagement and the availability of psychometric information (Fredericks et al., 2011). Regarding the multidimensionality of assessment, five measures currently examine all three subcomponents of engagement (behavioral, emotional, and cognitive); while five measures assess various bi-dimensional configurations (e.g., behavioral and emotional, cognitive and behavioral). The remaining four measures examine only one
dimension of engagement (Fredericks et al., 2011). Of the self-report scales, nine are worded to examine general engagement in school and five are intended for use at the class level. Two of the three teacher report instruments are used to examine engagement in any subject, while one measure specifically assesses engagement in reading activities. Regarding observational measures, two of the instruments assess classroom engagement class wide, while remaining scales examine the on- and off-task behavior of individual students (Fredericks & McColskey, 2012).

All of the instruments included in the Fredericks and McColskey (2012) review have published reliability and validity information located in peer-reviewed journals or other sources (e.g., book chapters, research websites). Scale developers typically reported internal consistency results for student self-report and teacher report measures that were at, or approaching, acceptable levels (Fredericks et al., 2011) with the values for most scales falling within the .70 to .80 range (Fredericks & McColskey, 2012).

There is also flourishing evidence towards the external and internal validity using scores obtained from these measures of engagement (Betts, 2012; Fredericks et al., 2011; Fredericks & McColskey, 2012, Lovelace et al., 2012). Thirteen measures reported correlations in the expected directions with student achievement variables (e.g., grade point average) and behavior (e.g., attendance, disciplinary incidents), while eleven scales presented promising results from either exploratory or confirmatory analyses (Fredericks & McColskey, 2012). More recent investigations of student engagement instruments (e.g., Betts, 2012) have demonstrated measurement variance properties of the measures as well. Practical applications of measuring engagement using such scales include conducting research on disengagement and dropout;
monitoring engagement at the individual, class, teacher, or district level; and informing and evaluation of school reform efforts (Fredericks et al., 2011).

**Limitations in Measuring Student Engagement**

Although there are a number of measures available, instruments for assessing engagement have yet to be utilized in a cohesive way that allows for useful comparison (Fredericks et al., 2011). These measures arise from different theoretical frameworks and disciplinary perspectives which have resulted in considerable variation in how student engagement has been conceptualized over time (Reschly & Christenson, 2012). Reaching a consensus regarding a high quality, multidimensional, definition of engagement has proved a difficult undertaking (Appleton et. al, 2006; Appleton, Christenson & Furlong, 2008; Reschly & Christenson, 2012). Since the correlation between the construct a researcher intends to measure and what is actually measured depends on definitional clarity and quality (Samuelson, 2012), such a lack of consensus is problematic (Betts, 2012; Fredericks, 2012; Reschly & Christenson, 2012). Even with definitional similarity across studies, however, comparing research findings remains challenging due to variability in item content of the scales (Fredericks & McColskey, 2012).

The dearth of measures designed to assess engagement over time is another critical limitation (Fredericks et al., 2004; Fredericks & McColskey, 2012). Depending on student age, indicators of engagement may evolve throughout development (Fredericks & McColskey, 2012). Research that uses confirmatory factor analytic techniques at different ages would be helpful in determining the stability of engagement across time (Appleton et. al, 2006; Betts, 2012; Fredericks et al., 2004; Fredericks & McColskey, 2012; Samuelson, 2012). Similarly, limited research utilizing a theory-based, comprehensive measure of engagement is available (Reschly &
Christenson, 2012). Longitudinal research may be of benefit as it allows for the examination of dropout trajectories, helps shed light on the relationship between student engagement and outcomes over time, and identifies the relative importance of engagement sub-constructs throughout development (Reschly & Christenson, 2012; Wylie & Hodgen, 2012).

Conducting longitudinal research would also facilitate examination of early changes in the engagement construct (Finn & Zimmer, 2012; Wylie & Hodgen, 2012). Such research may also reconcile discrepant research findings regarding the “fourth grade slump,” a period of during elementary school in which significant declines in engagement have been observed within the literature (Wylie & Hodgen, 2012). Studies commencing in elementary school would assist researchers in discerning the extent to which declines in engagement are typical from those which are more problematic and indicative of dropout. Furthermore, research that begins during early education would allow for the examining the correlations between earlier indicators and later trajectories (Finn & Zimmer, 2012; Wylie & Hodgen, 2012).

Measures such as the Motivation- Engagement Scale (Martin, 2009), an instrument that has already extended the age range of respondents downwards to elementary students and upward to college-age students, may prove useful in facilitating cross-sectional and longitudinal research of student engagement. Utilizing the Student Engagement Instrument (SEI; Appleton et al., 2006), which has recently been adapted for use with upper elementary (SEI-E; Carter et al., 2012) and college- aged students (SEI-C; Waldrop & Reschly, 2011) may be another possible option. The ideal longitudinal study would utilize a single, theory-based, scale with strong psychometric properties that examines all aspects of engagement (behavioral, affective, emotional) and is appropriate for use across development (Wylie & Hodgen, 2012). The SEI-E,
SEI, and SEI-C may be useful tools in fulfilling this purpose, pending further investigation regarding the reliability and validity of the recently piloted instruments.

**Purpose of the Present Study**

Sound measurement of student engagement remains elusive within educational research (Betts, 2012; Fredericks et al., 2004; Fredericks & McCloskey, 2012; Samuelson, 2012). One area of contention is the number and definition of sub-constructs that comprise the construct with various researchers positing a range of typologies (Reschly & Christenson, 2012; Finn & Zimmer, 2012; Fredericks & McColskey, 2012). The extent to which the latent structure of the student engagement construct varies with respect to maturation (i.e., grade level), ethnicity, and gender is another pivotal question that has yet to be fully addressed (Betts et al., 2010). Determining the extent to which the measurement properties and factor structure vary across age may provide valuable insights into the developmental nature of engagement and theoretical issues associated with engagement research (Betts et al., 2010; Betts, 2012). Should engagement prove invariant between subgroups, then scales used to measure engagement, in general, would produce equally valid inferences for all students. Conversely, if the underlying structure of engagement differs between subgroups, then separate measures are necessary to accurately capture the construct (Betts et al., 2010). As such, determining the extent of structural invariance is critical for valid interpretation of research findings and avoid misclassification of student risk (Betts, 2012).

Designed to examine engagement from the student perspective, the SEI was constructed to assess cognitive and affective engagement with school (Appleton et al., 2006). Several studies (e.g., Appleton et al.; Betts et al., 2010) have examined the psychometric properties of the SEI. Collectively, research findings suggest that the SEI demonstrates acceptable levels of reliability
and allows for valid inferences of self-reported levels of cognitive and affective engagement (Betts, 2012). Previous studies have also examined the external validity of the SEI by examining concurrent and predictive relationships between self-reported levels of engagement and other indicators of engagement (e.g., attendance, behavior incidents) and school performance (e.g., state achievement test scores). Correlations have generally been found in the expected direction such that students who endorsed higher levels of engagement had fewer tardies and absences, lower rates of behavior incidents, and higher academic achievement (Betts et al., 2010; Reschly et al., 2013).

The SEI may provide teachers and interventionists with critical information regarding students’ perceived levels of engagement (Appleton et al., 2006; Betts et al., 2010). Practical applications of the SEI are numerous and include uses such as monitoring levels of student engagement, identifying students at-risk, evaluating school reform efforts and interventions, and using the data to inform student advisement practices (Appleton, 2012; Fredericks et al., 2011) are but some of the potential uses of the SEI.

As mentioned previously, information gleaned from the SEI may be useful in identifying students early in the disengagement process (Finn, 1989, 1993). Thus far, validity evidence for the SEI has been accumulated with students in grades 6-12 (e.g., Appleton et al., 2006; Betts et al., 2010; Lovelace et al., 2011). Evidence from longitudinal studies (e.g., Archambault & Janosz, 2009; Barnett, 1995; Hart & Risley, 1995; Janosz et. al, 2008; Ramey & Ramey, 1998), however, suggests that early interventions targeting the formative years of education may be particularly effective in reducing negative outcomes such as special education placement, grade retention and early school departure. With the intent of addressing the need for early detection of
dropout risk, researchers (Carter et al., 2012) have modified and piloted the SEI-E which was adapted from the original instrument (Appleton et al., 2006).

If the SEI-E is to prove as useful as its predecessor, extensive examinations of the instrument and its psychometric properties are required. Initial pilot studies of the SEI-E found a similar structure to the SEI (Carter et al., 2012); however, replication of results using different samples is necessary in the iterative process of gathering evidence to support the validity of inferences made from a psychological measure (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education [AERA et al.], 1999). To this end, the present study sought to serve as a logical next step in the examination of validity evidence for utilizing the SEI-E as a measure of cognitive and affective engagement.

In addition to construct validity, the stability of measurement across demographic variables, referred to as measurement invariance, is particularly important due to the intended purposes of the SEI-E (e.g., identification of risk status, progress monitoring of engagement, intervention evaluation). Establishing invariance in measurement is also a prerequisite to making confident inferences and meaningfully comparing measurements across relevant subgroups within the population (Betts et al., 2010, Betts, 2012).

If engagement measures are to be used to identify dropout risk, examining the psychometric properties of such instruments across gender and different ethnic groups is critical (Betts, 2012; Samuelson, 2012). Data gleaned from such instruments may be useful for identifying students to receive intervention services and contribute towards our understanding research findings and theoretical advancements (Christenson et al., 2012; Samuelson, 2012). Adequately defining and measuring student engagement across gender and ethnicity, however, is
a necessary prerequisite to prevent inaccurate classification of students and invalid interpretation of research (Betts, 2012).

In light of the aforementioned premises, the current study endeavored to further develop the construct and external validity evidence of the SEI-E. The general purpose of the present study was to examine further the psychometric properties of the SEI-E with particular focus on factors related to internal validity and measurement invariance. Following the logic and methodology of previous examinations with the SEI (e.g., Appleton et al., 2006; Betts et al., 2010, Lovelace et al., 2013), the current study aimed to address the following research questions:

(1) Does the present sample of third through fifth graders replicate the previous finding that a four-factor structure provides the best model fit for conceptualizing early student engagement, or conversely, does a five-factor model prevail as hypothesized by scale developers?

(2) To what extent is the factorial structure of the SEI-E invariant across gender and socioeconomic status?

(3) To what extent does SEI-E data correlate, as expected, with behavioral indicators of engagement (e.g., office discipline referrals, disciplinary incidents, attendance)?
CHAPTER 3

METHODS

Participants

Participants were drawn from an extant dataset of third through fifth graders from Gwinnett County Public Schools (GCPS). As one of the largest urban school districts in the U.S., GCPS consists of 132 facilities serving approximately 165,000 elementary, middle, and high school students. Situated in the suburbs of Atlanta, GA, the school district is considerably diverse with regards to student ethnicity, socioeconomic status, and English proficiency. 2010 census data indicated that ethnic minorities (28.6% African American, 25.3% Hispanic, 10.3% Asian, 3.8% Multiracial, and 0.4% Native American) are well-represented in the district, comprising 69% of the GCPS population. There is also a significant population of students being served by special programs (48.9% of students are eligible for free and reduced lunch [FRL], 11.9% of students are receiving special education services, and 16.1% of students are designated as English Language Learners [ELL]) (GCPS, 2010). The student body of GCPS is similar to state-wide demographics, as reported by the Georgia Department of Education (2010).

To obtain a representative sample of the school district, four elementary schools were chosen based on the following demographic characteristics: ethnicity, percentage of students receiving FRL, special education eligibility, and ELL status. These parameters yielded a total of 2,504 students with complete SEI-E data. An ethnically diverse sample was obtained as participant ethnicities were 29.8% African American (N= 745), 28.9% Hispanic (N= 724), 28.6% White (N= 715), 8.5% Asian/Pacific Islander (N= 214), 4.1% Multiracial (N=102), and
less than 1% Native American/Alaskan Native (N= 4). Equivalent representation was achieved across gender (males= 50.1%) as well as grade level (third, fourth, and fifth grades =32.9%, 34.4%, and 32.6%, respectively). Congruent with county demographics, a large proportion of students (58.9%) were eligible for FRL, 13.7% of the students were eligible for special education services, and 15.6% were designated as ELL. Sample demographic characteristics are presented in Table 1.

Table 1. Description of Participants: Sample Sizes and Percentages

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>Sample Size/ Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sample Size</td>
<td>2,504</td>
</tr>
<tr>
<td>Male</td>
<td>1254/ 50.1</td>
</tr>
<tr>
<td>Female</td>
<td>1250/ 49.9</td>
</tr>
<tr>
<td>Grade Level:</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>825/ 32.9</td>
</tr>
<tr>
<td>4</td>
<td>862/ 34.4</td>
</tr>
<tr>
<td>5</td>
<td>817/ 32.6</td>
</tr>
<tr>
<td>Race:</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>745/ 29.8</td>
</tr>
<tr>
<td>Hispanic</td>
<td>724/ 28.9</td>
</tr>
<tr>
<td>White</td>
<td>715/ 28.6</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>214/ 8.5</td>
</tr>
<tr>
<td>Multiracial</td>
<td>102/ 4.1</td>
</tr>
<tr>
<td>Native-American</td>
<td>4/ .2</td>
</tr>
<tr>
<td>Primary Language:</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>2099/ 83.8</td>
</tr>
<tr>
<td>Other (ELL indicator)</td>
<td>405/ 16.2</td>
</tr>
<tr>
<td>Special Education Eligible</td>
<td>343 /13.7</td>
</tr>
<tr>
<td>FRL Status Eligible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1474/ 58.9</td>
</tr>
</tbody>
</table>

Measures

Cognitive and affective engagement were the main sub-constructs of interest in the present study. According to the Christenson, Appleton, and colleagues’ model of engagement (Appleton et al., 2006; Christenson et al., 2008) measuring cognitive and affective engagement
requires self-report as these are internally represented sub-constructs. The SEI-E, which is discussed below, was utilized to examine cognitive and affective engagement from the student perspective.

**Student Engagement Instrument- Elementary Version (SEI-E).** The SEI-E was used to assess self-reported levels of cognitive and affective engagement with school. This instrument was adapted from Appleton and colleagues’ original (2006) instrument, the SEI. The psychometric properties of the SEI have thus far been examined with middle and high school students (Appleton et al., 2006; Betts et al., 2012; Lovelace et al., 2013. Initial analyses (e.g., Appleton et al., 2006) revealed six factors (i.e., subscales). Affective engagement was examined via the Teacher-Student Relationships (TSR), Family Support for Learning (FSL), and Peer Support for Learning (PSL) subscales. Control and Relevance of School Work (CRSW), Future Aspirations and Goals (FGA), and Extrinsic Motivation (EM) subscales assessed cognitive engagement (Appleton et al., 2006). Later studies (e.g., Betts et al., 2010; Lovelace et al., 2013) removed two items that comprised the EM scale, which resulted in five subscales on the final version of the SEI.

Various studies have replicated the five-factor structure for students in grades 6-12 (Betts et al., 2010; Lovelace et al., 2013; Reschly et al., 2013). Measurement invariance evidence also suggests that items relate to latent constructs similarly across demographic variables such as age and gender (Betts et al., 2010). Reasonable evidence of the predictive validity of the SEI has also been demonstrated as risk status (as identified by SEI scores) correlated with early withdrawal and enrollment in an alternative school setting (Lovelace et al., 2013). Similarly, scores on the SEI have generally correlated as expected with variables such as behavioral incidents, grades, and standardized test scores (Betts et al., 2010; Reschly et al., 2013), providing evidence towards
concurrent validity of the instrument. Lastly, there is also validity evidence towards using the SEI as measure of engagement specifically with students at-risk for high school dropout (e.g., students with SLD, EBD) (Lovelace et al., 2013).

Identical to its predecessor, the SEI-E consists of 19 items intended to measure cognitive engagement (e.g., perceived relevance of school work) and 14 items designed to assess affective engagement (e.g., identification with school). All items are scored using a 4-point Likert scale (1= strongly disagree, 4= strongly agree) with higher scores indicating higher endorsed levels of engagement. Item content of the SEI-E is similar to the SEI; however, consulting with engagement scholars and the head of the GCPS counseling department resulted in minor changes in syntax, item wording, and sentence structure (Appendix A). Item revisions were conducted to ensure that the SEI-E is developmentally appropriate for younger students and addresses all relevant engagement constructs (Carter et al., 2012).

A recent pilot study (Carter et al., 2012) examined the psychometric properties of the SEI-E. Congruent with scale development methodology, exploratory (EFA) and confirmatory factor analyses (CFAs) were conducted to determine the best model-fit for the SEI-E data. Contemporary psychometric evaluations of the SEI (e.g., Betts et al., 2010) have removed the sixth factor of Extrinsic Motivation. Such studies provide initial empirical basis and theoretical rationale for the SEI-E; therefore, an a priori five-factor model was specified with item-factor loading patterns akin to the SEI’s structure. A variety of goodness-of-fit indicators were computed, per Brown’s (2006) recommendations, including: root mean square error of approximation (RMSEA) with 90% confidence interval, minimum fit chi-square, comparative fit index (CFI), Tucker- Lewis Index (TLI) and standardized root mean square residual (SRMR).
Previous findings (e.g., Appleton et al., 2006; Betts et al., 2010) lend tentative support for five or six-factor models (depending on the inclusion of Extrinsic Motivation); however, items on the Control and Relevance of School Work (CRSW) subscale behaved poorly (i.e., cross-loaded across factors) in the elementary school sample. Preliminary evidence suggested the construct of early student engagement is best represented by four sub-constructs or factors: TSR, PSL, FGA, and FSL (Carter et al., 2012), which is somewhat discrepant from studies examining the latent structure of the SEI with older students. Such findings may cause initial alarm as the SEI-E was constructed to maintain congruency with the factor structure obtained with the original SEI; however, this discrepancy may represent a valid qualitative difference in the construct of engagement in younger students.

**District Extant Variables.** Data on additional student variables (e.g., gender, ethnicity) were obtained from the de-identified extant dataset that included demographic and behavioral data. FRL was defined as students who qualify for either free or reduced lunch prices as determined by the United States Department of Agriculture income eligibility guidelines. Students classified as ELL meet certain criteria such as speaking a native language other than English, coming from an environment that significantly impacts English development, or whose ability to speak, read, write, or understand English impedes access to a free and appropriate education. District-level variables of interest included those thought to be indicators of behavioral engagement such as Office Discipline Referrals (ODRs), attendance (including excused and unverified absences), and suspension days (i.e., number of in-school [e.g., quiet room] and out-of-school suspension [removal from the school building]).
Procedures

Data were drawn from a de-identified extant dataset provided by the GCPS Research and Evaluation office. Surveys for the current study were collected Spring 2011. Sample parameters (i.e., demographic inclusion variables) were formulated based on the SEI-E pilot study (Carter et al., 2012) and attempts were made to include a sample equally representative of student characteristics (e.g., ethnicity, gender).

This study is unique in that the SEI is currently administered (via passive consent) to all sixth through twelfth-grade students in the district twice per year as part of the school district’s advisement program and ongoing efforts to monitor student engagement. Therefore, the administration protocol of the SEI-E was identical to current standardized SEI administration practices. On-site monitors were utilized as a resource to ensure administration integrity and minimize careless responding. Surveys were orally administered class-wide to control for reading difficulties, and prevent targeting of individual students. Survey completion time typically ranged from 18-22 minutes.

Analytic Method

Data Screening of the SEI-E. Following administration of the SEI-E, completed scales were scanned into a de-identified SPSS data file. Student demographic data (e.g., grade, gender, ethnicity, ELL status), were extracted from the data files and irreconcilable answers (e.g., “disagree” and “agree”) were coded as missing. Participants who completed less than 75% of SEI items were excluded from analyses. This resulted in the removal of forty two participants, which was determined to be negligible due to the large sample size.

Research Question One: Factorial Structure of the SEI-E. Typical scale development consists of several phases during which the researcher attempts to provide evidence toward the
reliability and validity of the measure. Accumulating evidence towards the valid interpretation of scores from a measure, however, is a tentative and iterative process, requiring several replications across samples and time. The first research question examined the internal validity, or the extent to which the relationship among scale items conform to the proposed score interpretations (AERA et al., 1999) of the SEI-E.

Determining the factor structure of the SEI-E is the initial step in providing evidence towards the construct validity of the scale and replication of findings provides additional credence towards scale validity. To address this question, analysis logic and procedures for the current study were similar to those conducted in previous validation studies of the SEI (e.g., Appleton et al., 2006; Betts et. al., 2010) and SEI-E (Carter et al., 2012). EFA procedures were conducted with randomly selected half of the dataset (n= 1,267) to explore the underlying factor structure as well as confirm the best items to use to scale each factor in the CFA portion of the analyses. The demographic composition of the split-half sample was akin to full sample characteristics. Regarding EFA analysis logic, common factor analysis was employed to demonstrate the relations among the SEI-E items as functions of latent constructs. For each iteration, the geomin rotation (an oblique method) was utilized. Delta values were set to zero to model the expected correlation between sub-constructs (i.e., factors) of engagement as theorized by instrument developers. Missing data were treated using pairwise deletion to maximize the number of valid cases included in factor analyses. Pairwise deletion was utilized to maximize the number of valid cases included in the final dataset. The second portion of the split-half dataset was utilized to conduct CFA procedures based on the two most plausible models.

Software and estimation methods were identical to those utilized in the initial SEI-E validation study (Carter et al., 2012) to examine whether previous findings hold true for the
current data. Typically, five or more categories are required for data to be treated as continuous; therefore, SEI-E data are treated as non-continuous ordinal data due to the limited number (4) of Likert-type response categories. Mplus version 6.12 (Muthén & Muthén, 1998-2011) was used to facilitate EFA and CFA analyses because this software package utilizes a robust weighted least squares (WLSMV) estimation method that is specifically designed for categorical data analyses (Muthén & Muthén, 2005). Regarding model parameters, items were analyzed as ordinal indicators using a geomin rotation to account for the expected factor correlations. Similar to EFA logic, missing data were excluded using pairwise deletion.

A variety of model fit indices were computed to compare differences between models. Chi-square tests, comparative fit index (CFI), Tucker- Lewis Index (TLI) and root mean square error of approximation (RMSEA) were utilized to determine model fit. More weight was placed on the CFI (≥0.95), TLI (≥0.95) and RMSEA (≤ .05) as statistical criteria of importance as the chi-square test is often statistically significant with large sample sizes (Brown, 2006). Regarding individual fit indices, CFI and TLI have possible ranges of 0.0 to 1.0 with values closer to 1.0 suggesting good model fit (Bentler, 1990). The RMSEA has values ranging between 0.0 and 1.0, with values close to zero indicating desirable fit (Browne & Cudeck, 1993). RMSEA values adjust for model parsimony, which is an important factor when validating instruments that are both based on, and used to, inform theoretical principles as with the SEI-E. Congruent with analysis procedures of the initial SEI-E validation study (Carter et al., 2012), individual parameter estimates were evaluated to determine possible localized areas of poor fit. The extent of localized model fit was investigated via assessing the size, significance, and interpretability of parameter estimates.
To gather additional information about the stability of each factor obtained in the CFA solution, coefficient alpha (Cronbach’s alpha) values were calculated to determine the internal consistency of scale items using SPSS 21.0.

**Research Question Two: Measurement Invariance of the SEI-E.** Measurement invariance concerns the extent to which the psychometric properties of observed indicators are generalizable across groups, time, or conditions (Templin, 2012). Measurement model invariance is often assumed; however, it frequently goes untested. The first step in this process requires examination of configural invariance, or the extent to which the same factor structure is demonstrated between groups (Templin, 2012). For example, evidence towards gender configural invariance would be suggested if the same four factors demonstrate the same pattern of relationships with items for both males and females. Based on the analysis logic of Betts et al. (2010), configural invariance across gender and socioeconomic status was tested via a multiple group confirmatory factor analytic approach with a series of nested models of increasing parameter restrictions. This was tested in a stepwise fashion by using the general model (identified via CFA) as a baseline by which to compare all other groups (i.e., gender and FRL eligibility). Metric invariance, also known as “weak factorial invariance” or “construct comparability,” examines the similarity in factor loadings and patterns between groups. Construct comparability (Wu, Li, and Zumbo, 2007) must be established prior to making valid claims regarding the equivalence in measuring the construct of interest across groups. Otherwise, differences in group means, scores, or pattern loadings may not necessarily indicate true quantitative differences in the construct (Betts, 2012; Webb & Neuharth-Pritchett, 2011).

Consistent with procedures undertaken in previous invariance studies (i.e., Betts et al., 2010), each item was allowed to have a different loading; however, loadings are constrained to
be equal for individual items across groups (Templin, 2012). Latent factor means and variances were constrained to 0 and 1, respectively, to allow for estimation of all factor loadings and intercepts in the model rather than scaling the factor by setting the first item to 1.0. This allows one to determine whether groups attribute similar meanings to each latent construct and examines whether the levels of underlying items are the same between groups (Templin, 2012; van de Schoot, Lugtig, & Hox, 2012). Both of these conditions are necessary for valid comparisons. Since differences between nested model $\chi^2$ values do not also follow a $\chi^2$ distribution, Mplus provides a difference test based on the derivatives of the nested models (Brown, 2006). This version of the $\chi^2$ test was used to test all nested model differences and as a main source of evidence for judging invariance. Also considered were commonly accepted heuristics for determining goodness-of-fit to data (e.g., CFI≥.90, RMSEA ≤ .05) that were detailed above. All measurement invariance analyses were conducted using Mplus version 6.12 (Muthén & Muthén, 1998-2012).

**Research Question Three: External Validity.** To evaluate the extent to which the SEI-E correlates, as expected, with external behavioral indicators of engagement (external validity), Spearman’s Rho correlations (a nonparametric measure of statistical association) were computed between SEI-E data and external variables (attendance, behavioral incidents, number of days suspended). Nonparametric correlations were used due to the skewed nature of behavior indicators. This method is identical the procedures utilized to investigate external validity properties in the SEI-E pilot study (Carter et al., 2012). As mentioned previously, scale validation requires multiple replications before valid assumptions regarding the relationships between the measure in question and the construct of interest. Prior methodology was applied to the present study to examine the extent to which findings are replicated in the current sample.
CHAPTER 4
RESULTS

Preliminary Analyses

Item analyses, including examination of frequency distributions, means, standard deviations, skewness, and kurtosis values were conducted for all items. Those with skew and kurtosis values greater than 3.0 and 8.0, respectively, were considered as violating the assumption of normality (Kline, 2005). Skew absolute values for the current data ranged from -2.809 to .324 whereas kurtosis values fell within the range of -.598 to 8.763. All items were negatively skewed, suggesting that students endorsed mid to high levels of self-reported student engagement. Based on the aforementioned parameters, all SEI-E items satisfied criteria with the exception of item 17 (“When I do well in school it is because I work hard”), which violated the kurtosis criteria (item 17 kurtosis value= 8.763). One possible explanation for the failure of item 17 to meet normality criteria may be the propensity for elementary school-aged students to possess a relatively high external locus of control compared to older students or adolescents (e.g., Morris & Messner, 1978; Schultz & Pomerantz, 1976). Individuals who possess a high external locus of control attribute success or failure to outside factors (e.g., teacher attitude, perceived work difficulty, luck, chance) instead of internal factors related to their own effort (e.g., class participation, study behavior) or ability (e.g., Gordon, 1977; Nunn & Nunn 1993). The tendency for young children to endorse high external control in tandem with restriction in range of responses may explain the leptokurtic nature of the item. Further investigation is required to determine whether the item itself (i.e., item wording, item structure) is problematic or
whether this item performs differently due to true differences in how these students conceptualize the meaning of this item or its relationship to engagement.

Regarding other parameters, examination of item standard deviations revealed low variability of responses in the current sample as indicated by standard deviations lower than 1.0 for all items and standard deviations lower than .80 for ten items (Bandalos, 2011). In other words, self-reported levels of engagement tended to be restricted in range, and therefore, similar across students. Low variance in responses may prove statistically problematic; however, ranges tended to indicate higher levels of engagement which may be indicative that most students self-report moderate to high cognitive and engagement. Such findings may be of practical importance to practitioners, researchers, and interventionists.

**Research Question One**

Previous findings investigating the factor structure of the SEI-E (Carter et al., 2012) determined that a four-factor model best described the construct of early student engagement. Scale validation requires multiple analyses of latent structure; therefore, the first research question sought to provide provisional evidence towards this process via examining the extent to which current results are congruent with previous findings. Following typical scale validation procedures, exploratory factor analyses were first conducted on a split-half sample of the data. Results suggested retaining between three and seven factors as evidenced by the scree plot (Figure 1) and eigenvalue greater than 1.0 criteria.

Figure 1.
*Exploratory Analysis Scree Plot*
The four- and five- factor models were compared with regard to fit indices (Table 2), item loadings, percent of variance explained by each factor, and total percentage of variance explained based on the proposed model. Theoretical interpretation of factors based on proposed latent constructs and model plausibility was also considered in determining best model fit. Preliminary examination of the EFA results revealed that 35.59% of the total variance was explained by retaining a five-factor model solution. Specifically, Factor 1 (items 8, 11, 17, 19, 25, 26, 30, 34, and 35) accounted for 19.69% of the variance, Factor 2 (items 4, 6, 7, 14, 23, and 24) explained 5.84% of the variance, Factor 3 (items 3, 5, 9, 10, 13, 16, 21, 22, 27, 28, 31, and 33) accounted for 4.78% of model variance, and 3.29% of model variance was explained by Factor 4 (items 18 and 32). According to commonly accepted EFA guidelines (e.g., Browne and Cudeck, 1996) three or more salient item loadings are required for a factor to be “interpretable.” Factor 4 proves problematic as it only consists of two items, and is, therefore underdetermined. In cases of underdetermination, factor analysis guidelines typically suggest that such results may indicate that too many factors have been specified or extracted (Bandalos, 2010; Brown & Cudeck, 1996). Furthermore, Factor 5 (items 1, 12, 20, and 29) accounted for comparatively less model variance as only 1.89% of variance was explained by this factor.

Regarding model fit of the five-factor solution, RMSEA, CFI, and TLI, indices met criteria for adequate fit based on interpretation standards as delineated by Browne & Cudeck (1993) and Bentler (1990). Further examination of EFA rotated factor loadings, however, revealed interesting patterns. Three items (item 9- “Most of what is important to know you learn in school;” item 27- “I feel safe at school;” item 28- “I feel like I have a say about what happens to me at school.”) did not meet the .40 criteria for salient loading onto any factor using the five-factor solution. Items 9 and 28 demonstrated significant loadings on the CRSW subscale in the
original (i.e., Appleton, 2006) measure. The failure of these items to load onto any factor may indicate problems with the CRSW scale itself and the items thought to tap into this sub-construct, which is congruent with contemporary examinations of the SEI-E suggesting that several items within the CRSW subscales behave poorly regarding loading patterns, item parameters, and relationships with other sub-constructs and indicators (e.g., negative correlations, weak correlations).

The loading pattern of item 34 (“What I'm learning in my classes will be important in my future.”) was another interesting finding as this item demonstrated salient loading with items pertaining to teacher-student relationships (e.g., “I enjoy talking to the teachers here;” “Adults at my school listen to the students”); however, the item is theoretically less related to this part of the sub-construct. Lastly, when examining correlations between factors in the five-factor model, significant relationships were found between cognitive and affective factors (CRSW & TSR [.737] and FSL & CRSW [.702]). Though correlations are expected because these factors are subsumed within a larger construct, such high correlations are not optimal. Theoretically, factor correlations should be higher between factors underlying the same sub-construct (i.e., affective and cognitive engagement) than correlations across sub-constructs. Such high correlations may indicate poor item parsimony, issues with individual item wording on one or both subscales, or that the individual items measure more than one theoretical construct. All of these conditions are less than optimal when attempting to establish the applicability of the proposed model to the construct of interest and further investigation using more advanced statistical techniques is likely warranted. Betts (2012), for example, utilized a higher order confirmatory factor analytic approach to determine the relationship the latent structure of cognitive and affective engagement.
Similar methodology should be applied to the SEI-E in order to further explicate the underlying correlations between sub-constructs demonstrated in the current study.

Table 2.

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>( Df )</th>
<th>RMSEA</th>
<th>90% CI for RSMEA</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four- Factor</td>
<td>361.462*</td>
<td>186</td>
<td>0.031</td>
<td>[0.026, 0.036]</td>
<td>0.981</td>
<td>0.972</td>
</tr>
<tr>
<td>Five- Factor</td>
<td>670.554*</td>
<td>373</td>
<td>0.028</td>
<td>[0.025, 0.032]</td>
<td>0.977</td>
<td>0.967</td>
</tr>
</tbody>
</table>

Goodness of Fit Guidelines

\(<.05^a\)  \(<.05^a\)  \(\geq .95^b\)  \(\geq .95^b\)

*Note. \( \chi^2 \) = model minimum fit chi-square; \( df \) = degrees of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis Index.

\(^a\)Browne & Cudeck, 1993. \(^b\)Bentler, 1990. *\( p < .001 \)

Following examination of the five-factor solution, EFA results of the four-factor solution were investigated to examine the appropriateness of retaining four factors, as hypothesized by scaled developers. Analysis of the four-factor solution revealed that RMSEA, CFI, and TLI values met goodness-of-fit criteria. Furthermore, the probability that the RMSEA was less than or equal to .05 was > .99, which suggests excellent model fit (Betts, 2012). Factor loading patterns and standardized parameter estimates for the four-factor model are presented in Table 3. Regarding factor structure, rotated loadings were salient for every item (factor loading range= .44 to .83), as represented by loadings of .40 or higher (Brown, 2006). Furthermore, removal of CRSW items resulted in each item loading significantly to only one factor. This suggests a cleaner factor structure relative to the cross-loadings observed in the five-factor model. Examination of parameter estimate standard errors indicate that estimates were stable and appropriate in magnitude (ranging from .02 to .04). Similarly, factor correlations were positive in direction (as expected based on theory) and moderate in magnitude (ranging from 0.386 to 0.525). Overall, parameter estimate results (e.g., direction, magnitude, significance of parameter
estimates) provide preliminary evidence for the appropriateness of retaining a four-factor solution. Findings obtained from previous validation studies of the SEI and SEI-E tentatively hold true to the current study.

Table 3.

*Standardized Parameter Estimates in the Four-Factor SEI-E Model: Rotated Factor Loadings*

<table>
<thead>
<tr>
<th>Items</th>
<th>TSR</th>
<th>PSL</th>
<th>FGA</th>
<th>FSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>31. Teachers at my school care about students.</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. My teachers are there for me when I need them</td>
<td>.65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Most teachers care about me as a person, not just a student.</td>
<td>.63</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. Adults at my school are fair towards students most of the time.</td>
<td>.60</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The rules at my school are fair.</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Adults at my school listen to the students.</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27. I feel safe at school.</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Other students care about me.</td>
<td></td>
<td>.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Other students here like me the way I am.</td>
<td></td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Students at my school are there for me when I need them.</td>
<td></td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. I have friends at school.</td>
<td></td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. I enjoy talking to the students here.</td>
<td></td>
<td>.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Students here respect what I have to say.</td>
<td></td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. I plan to go to college after I graduate high school.</td>
<td></td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Continuing to learn after high school is important.</td>
<td></td>
<td>.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. School is important for reaching my future goals.</td>
<td></td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. My education will create many chances for me to reach my future goals.</td>
<td></td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30. I am hopeful about my future.</td>
<td></td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. When I have problems at my school my family/guardian(s) are ready to help me.</td>
<td></td>
<td>.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. My family/guardians are there for me when I need them.</td>
<td></td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. My family/guardian(s) want to know when something good happens at school.</td>
<td></td>
<td>.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. My family/guardian(s) want me to keep trying when things are tough at school.</td>
<td></td>
<td>.44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Congruent with scale validation procedures, CFA was conducted on the second half of the data to evaluate the correspondence between the intended theoretically based measurement model and the observed SEI-E response data (Betts, 2012). The four- and five-factor solutions
were compared to verify the appropriateness of retaining four-factors to represent the latent 
structure of the current SEI-E data. Fit indices and interpretation guidelines are presented in 
Table 4. RMSEA values and confidence intervals are similar between four-and five-factor 
models. Of note, examination of CFI and TLI indices fit indices for the five-factor solution 
reveals that the CFI value for the five-factor model barely meets the goodness-of-fit criteria, 
bordering less than optimal fit. Similarly, the five-factor model solution results in a less than 
optimal TLI value that does not meet the ≥ .95 interpretation guideline for good model fit. 
Investigation of model fit indices for the four factor model, however, indicates that CFI and TLI 
values are well above the ≥.95 goodness-of-fit guideline. Such results provide tentative evidence 
suggesting that, congruent with prior validation studies of the SEI-E, the four-factor solution 
provides best fit to the current data.

Table 4.

<table>
<thead>
<tr>
<th>Model</th>
<th>( \chi^2 )</th>
<th>Df</th>
<th>RMSEA</th>
<th>90% CI for RSMEA</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four- Factor</td>
<td>587.013**</td>
<td>246</td>
<td>0.037</td>
<td>[0.033, 0.041]</td>
<td>0.964</td>
<td>0.960</td>
</tr>
<tr>
<td>Five- Factor</td>
<td>1105.489*</td>
<td>485</td>
<td>0.036</td>
<td>[0.033, 0.039]</td>
<td>0.951</td>
<td>0.947</td>
</tr>
</tbody>
</table>

Goodness of Fit Guidelines

<table>
<thead>
<tr>
<th>Goodness of Fit</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;.05(^a)</td>
<td>≥ .95(^b)</td>
<td>≥ .95(^b)</td>
</tr>
</tbody>
</table>

Note. \( \chi^2 \) = model minimum fit chi-square; \( df \) = degrees of freedom; RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker- Lewis Index.

\(^a\)Browne & Cudeck, 1993. \(^b\)Bentler, 1990. \(*p<.001\)

Also congruent with the theorized relationship between indicators and underlying constructs, observed correlations between subscales revealed that the affective subscales of TSR, FSL, and PSL significantly correlated with each other. Of note, statistically significant relationships (i.e., correlations) were demonstrated between indicators of cognitive engagement (FGA) and affective engagement (TSR, PSL, FSL) that were similar in magnitude. This proves
problematic as correlations across domains (i.e., relationships between affective and cognitive factors) should, theoretically, be smaller than the relationship between indicators within each domain. Betts (2012) used various measurement approaches (e.g., congeneric CFA models, item response theory analyses, bifactor models) to evaluate the psychometric properties of the SEI. Bifactor models suggested the plausibility of a general factor of engagement, which may explain significant correlations observed across affective and cognitive domains. Further research using more sophisticated statistical techniques such as those utilized in the Betts (2012) methodology are warranted with the SEI-E to explicate the relationships between constructs thought to underlie cognitive and affective engagement in upper elementary-aged students.

Table 5. 
*Correlations Between Factors in the SEI-E Four-Factor Model*

<table>
<thead>
<tr>
<th></th>
<th>TSR</th>
<th>PSL</th>
<th>FGA</th>
<th>FSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSR</td>
<td>----</td>
<td>0.291*</td>
<td>0.207*</td>
<td>0.271*</td>
</tr>
<tr>
<td>PSL</td>
<td>0.291*</td>
<td>----</td>
<td>0.158*</td>
<td>0.243*</td>
</tr>
<tr>
<td>FGA</td>
<td>0.207*</td>
<td>0.158*</td>
<td>----</td>
<td>0.272*</td>
</tr>
<tr>
<td>FSL</td>
<td>0.271*</td>
<td>0.243*</td>
<td>0.272*</td>
<td>----</td>
</tr>
</tbody>
</table>

TSR = Teacher-Student Relationships  
PSL = Peer Support For Learning  
FGA = Future Goals and Aspirations  
FSL = Family Support For Learning  
* = p < .05

Additional Validity Evidence: Internal Consistency. Considering the intended purpose of the SEI-E, establishing evidence towards criterion-related and constructed validity is pertinent to the current study. Using items as identified by salient loadings of the four-factor model, Cronbach’s alpha (α) values were calculated across the total SEI-E and four subscales (TSR, PSL, FGA, FSL). This was undertaken to empirically assess whether items measure the same general construct or sub-constructs (i.e., the correlations between items) within hypothesized subscales (Huck, 2004). Reliability estimate results are presented in Table 6. Overall, all subscales demonstrated acceptable to good reliability based on the SEI-E Four-Factor Model as evidenced by Cronbach’s alpha values ranging from .639 (FSL) to .820 (PSL). The current
findings are similar to previous results examining the reliability of subscales within the SEI (Appleton et al., 2006) and SEI-E (Carter et al., 2012).

Table 6.  
*Internal consistency estimates for SEI-E Total Score and Subscales*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Coefficient alpha value (α)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEI-E Total Score</td>
<td>.859</td>
</tr>
<tr>
<td>TSR</td>
<td>.812</td>
</tr>
<tr>
<td>FGA</td>
<td>.663</td>
</tr>
<tr>
<td>PSL</td>
<td>.820</td>
</tr>
<tr>
<td>FSL</td>
<td>.639</td>
</tr>
</tbody>
</table>

TSR= Teacher - Student Relationships  
FGA= Future Goals and Aspirations  
PSL= Peer Support for Learning  
FSL= Family Support for Learning

**Research Question Two**

Configural and metric invariance were examined across gender and FRL status. Table 7 presents the model fit index results from the series of nested models used to assess factorial invariance. Results revealed that configural invariance was obtained across lunch status. In other words, when comparing the latent structure and model fit between students who do not qualify for FRL with those are eligible for FRL, model fit indices met criteria for good fit (e.g., CFI > .95, TLI > .95, RMSEA < .05). Of note, the proposed model demonstrated better fit for individuals ineligible for FRL as model indices met criteria for good fit. When the model was applied to students who received FRL, however, indices only met criteria for adequate fit. When loadings were constrained to be the same across groups, however, significant differences (p < .05) were observed, suggesting that the subsequent constrained model demonstrated poorer model fit (i.e., the metric invariance model fit less well than the configural invariance model). Modification indices were then examined to determine effects of allowing individual items to be freely estimated. This iterative procedure consists of sequentially removing item constraints and then re-testing the model using chi-squared difference tests. Partial metric invariance is suggested once freeing an item (or a few items) results in non-significant (p > .05) chi-square
values. In the current study, partial metric invariance was suggested after freeing item 17 (“When I do well in school it is because I work hard”) as observed by non-significant ($p > .05$) chi-square values for difference tests. Of note, substantive theoretical rationale and empirical evidence are needed to justify metric invariance procedures (i.e., decision to free or constrain various items in a particular order). For example, in the current study freeing item 17 (“When I do well in school, it is because I work hard.”) resulted in partial metric invariance across groups.

It is possible that item 17 may simply be a poorly worded item; however, it is also possible that engagement response levels truly differ across groups as measured by this item. As mentioned previously, item 17 also violated normality assumptions as indicated by descriptive statistics analyses. Additional investigation using advanced statistical procedures such as Item Response Theory (IRT) is necessary via future SEI-E research to the further examine the psychometric characteristics of items that behave poorly (Betts, 2012; Samuelson, 2012).

Table 7.
Model Fit Indices: Results of the Series of Nested Models.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\chi^2$</th>
<th>Df</th>
<th>RMSEA</th>
<th>90% CI for RSMEA</th>
<th>CFI</th>
<th>TLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socioeconomic Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRL ineligible</td>
<td>376.83*</td>
<td>246</td>
<td>0.038</td>
<td>0.030-0.046</td>
<td>0.965</td>
<td>0.961</td>
</tr>
<tr>
<td>FRL eligible</td>
<td>420.19*</td>
<td>246</td>
<td>0.044</td>
<td>0.037-0.051</td>
<td>0.947</td>
<td>0.940</td>
</tr>
<tr>
<td>FRL Configural Invariance</td>
<td>797.98*</td>
<td>495</td>
<td>0.041</td>
<td>0.036-0.046</td>
<td>0.957</td>
<td>0.952</td>
</tr>
<tr>
<td>FRL Metric Invariance</td>
<td>808.39*</td>
<td>515</td>
<td>0.040</td>
<td>0.034-0.045</td>
<td>0.958</td>
<td>0.955</td>
</tr>
<tr>
<td>FRL Metric Inv. w/o Item 17</td>
<td>789.56*</td>
<td>514</td>
<td>0.038</td>
<td>0.033-0.044</td>
<td>0.961</td>
<td>0.958</td>
</tr>
<tr>
<td>(Difference Test)</td>
<td>25.204</td>
<td>19</td>
<td>0.038</td>
<td>0.033-0.042</td>
<td>0.961</td>
<td>0.958</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>448.73*</td>
<td>246</td>
<td>0.044</td>
<td>0.037-0.050</td>
<td>0.957</td>
<td>0.952</td>
</tr>
<tr>
<td>Females</td>
<td>402.41*</td>
<td>246</td>
<td>0.037</td>
<td>0.030-0.043</td>
<td>0.957</td>
<td>0.952</td>
</tr>
<tr>
<td>Gender Configural Invariance</td>
<td>842.83*</td>
<td>492</td>
<td>0.040</td>
<td>0.035-0.044</td>
<td>0.958</td>
<td>0.953</td>
</tr>
<tr>
<td>Gender Metric Invariance</td>
<td>854.12*</td>
<td>512</td>
<td>0.039</td>
<td>0.034-0.043</td>
<td>0.959</td>
<td>0.956</td>
</tr>
<tr>
<td>Metric Invariance w/o Items 28 and 7</td>
<td>837.279*</td>
<td>510</td>
<td>0.038</td>
<td>0.033-0.042</td>
<td>0.961</td>
<td>0.958</td>
</tr>
</tbody>
</table>
Similar measurement invariance results were observed regarding student gender. The proposed model demonstrated good fit (e.g., CFI >.95) for both genders individually. Configural invariance was also obtained as good fit was also revealed once examined across both genders. As with the FRL variable, metric invariance was not observed when item loadings were constrained to be the same across groups. Sequentially allowing item 27 (“I feel safe at school.”) and item 28 (“My education will create many chances for me to reach my future goals”) to be freely estimated, however, resulted in partial metric invariance. Overall measurement invariance results tentatively suggest that the students within each demographic category provided responses that were similar in their structural relationship to engagement and somewhat similar in their ordering on engagement factors. In other words, the hypothesized number of factors (four) held across both genders and socioeconomic status. These preliminary results are congruent with a portion of the measurement invariance findings using gender as a grouping variable with the original SEI (Betts et al., 2010). In general, partial measurement invariance, as observed in the current study, is acceptable within the measurement literature (Templin, 2012); however, little consensus has been reached regarding the definition of “partial.” Further examination is likely warranted regarding items that initially prevented metric invariance as these items demonstrated dissimilar loading patterns between groups. There may be issues with the items themselves, or, conversely these facets of engagement may be truly represented at different levels across gender and socioeconomic status.
Research Question Three

Regarding behavioral variables, low frequencies of student disciplinary and attendance problems were observed. ODRs were relatively rare as 95.4% (n=2,388) of students had no office referrals, 3.6% (n= 89) of the sample had one referral, and only 1.1% (n=27) of students had two or more discipline referrals on record. Similar patterns were observed with regards to in-school (ISS) and out-of-school suspension (OSS) rates. Less than 1% (n=9) of students had one or more ISS day, whereas only 1.2% (n=30) of students had one or more OSS days. The low frequency of behavior referrals and suspensions may be due to the fact that few students demonstrate behaviors that are perceived by teachers and administrators as severe enough to warrant such disciplinary action at the elementary school level. Regarding attendance variables, 14.1% (n=354) of students demonstrated perfect attendance (no absences), 51.8 % (n= 1,298) had one to three absences, 37.6% (n= 939) had four to nine absences, and only 7.9% (n= 255) had ten or more recorded absences (mean= 4.3 days absent, range= 0-29 days absent). School tardies were also relatively few as the majority of students 80.2% (n= 2,007) had fewer than three days tardy (mean= 1.8 days tardy, range= 0-54 days tardy).

Spearman’s Rho correlations revealed several statistically significant correlations between the SEI-E total score and indicators of behavioral engagement (Table 8) in the expected directions (i.e., students who endorsed higher levels of engagement had fewer ODRs and ISS days). When considering the SEI-E factor scores, no significant correlations were found between PSL and indicators of behavioral engagement. However, correlations between ODRs and TSR, FGA, and FSL were significant and in the expected direction. Out-of-school suspensions also exhibited a statistically significant negative relationship with FSL; whereas in-school-suspension significantly correlated with TSR and FSL in the negative direction. Taken
together external variables thought to be indicative of behavioral engagement are generally correlated as expected with SEI-E factor scores. This is congruent with previous results external validity results obtained in the initial SEI-E validation study (Carter et al., 2012).

Of note, several caveats and limitations are notable regarding the confidence and statistical rigor of external validity conclusions. Although statistically significant correlations were observed between several subscales and behavioral indicators, this relationship did not hold true across all subscales. Furthermore, significant correlations were generally small in size and may be of limited practical utility as appropriate indicators of concurrent and predictive validity regarding student engagement and relevant outcomes.

Current results should also be interpreted with caution due to the rarity and low variance observed regarding behavioral incidents within the data. Compared to the total sample, the proportion of students with one or more discipline referrals or days of suspension was considerably small. This is likely due to the nature of behavioral expectations at the elementary school level such that low-level behaviors severe enough to warrant disciplinary action are few and far between with such a young demographic.

The low base rate of such behaviors is less than desirable when attempting to establish evidence towards concurrent validity due to limited statistical power and sample generalizability. Future research using other external indicators of behaviors thought to correlate with cognitive and affective engagement (e.g., standardized test scores, post-secondary enrollment) that provide for larger, more inclusive, sample sizes is required to substantiate valid claims regarding concurrent validity of data obtained using the SEI-E and relevant student outcomes.
Table 8.
Spearman’s Rho Correlations Between Factor Scores and Associated Variables

<table>
<thead>
<tr>
<th></th>
<th>TSR</th>
<th>PSL</th>
<th>FGA</th>
<th>FSL</th>
<th>Absences</th>
<th>ISS</th>
<th>OSS</th>
<th>ODR</th>
<th>SEI-E Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSR</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSL</td>
<td>.481**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FGA</td>
<td>.491**</td>
<td>.353**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSL</td>
<td>.480**</td>
<td>.466**</td>
<td>.640**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absences</td>
<td>.018</td>
<td>-.024</td>
<td>-.038</td>
<td>.014</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISS</td>
<td>-.057*</td>
<td>-.027</td>
<td>-.025</td>
<td>-.043*</td>
<td>.027</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSS</td>
<td>-.014</td>
<td>-.005</td>
<td>-.035</td>
<td>-.050*</td>
<td>.087**</td>
<td>.438**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODR</td>
<td>-.066**</td>
<td>-.038</td>
<td></td>
<td>-.055*</td>
<td>.051*</td>
<td>.614**</td>
<td>.692**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>SEI-E Total</td>
<td>.820**</td>
<td>.777**</td>
<td>.756**</td>
<td>.746**</td>
<td>-.038</td>
<td>-.068**</td>
<td>-.033</td>
<td>-.098**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

ISS= In-school Suspensions
OSS= Out-of-school suspensions

Summative Findings

Considering the cumulative findings of confirmatory factor analyses, item loadings and patterns, and reliability estimates of subscales; results provide preliminary evidence that the four-factor model presents as a plausible model for the current SEI-E data. This tentative conclusion is based on model-fit indices as well as examination of structure based on theoretical rationale as hypothesized by scale developers. Congruent with preliminary validation studies of the SEI-E (Carter et al., 2012), Teacher Student Relationships, Peer Support for Learning, Future Goals and Aspirations, and Family Support for Learning are relevant constructs when examining student engagement during the upper elementary school years as evidenced by measurement invariance analyses.

Under this premise, the latent structure of engagement in elementary-aged students is discordant with results of studies examining the psychometric properties of the SEI with middle and high school students. Findings from these studies suggested either five- (including the Control and Relevance of School Work subscale) or six-factor models of engagement depending
on the inclusion of items examining extrinsic motivation. Such differences may, indeed, represent qualitative changes in the engagement construct over time. Further evidence is needed, however, before such conclusions can be reached. Measurement invariance investigations provided mixed results. Configural invariance was obtained under the premise that four-factors underlie the latent structure of engagement with upper elementary school students. Partial metric invariance across groups was obtained; however, further inquiry is needed to justify metric invariance procedures.

Lastly, initial validation studies put forth preliminary evidence towards external validity as indicated by small, statistically significant correlations between SEI-E factor scores and several concurrent behavioral indicators of engagement (e.g., ODR, ISS; Carter et al., 2012). Similar patterns were observed in the current study, which may provide additional evidence towards the concurrent validity and utility of the instrument. Of note, there are several statistical and practical limitations with using indicators with such a low base-rate and limited variance to establish external validity properties of the measure. As with all aspects of scale validation, further research is needed before defensible conclusions can be made regarding the internal and external validity of the measure.
CHAPTER 5
DISCUSSION

Curtailing the current national crisis of student dropout is a significant concern in U.S. schools. Emphasis on this phenomena is rightfully placed due to the host of negative outcomes that affect individuals who dropout, their families, and the economy (Kirsch et al., 2007). Fortunately, the construct of student engagement has emerged as a promising heuristic when conceptualizing dropout, formulating prevention and intervention practices, and evaluating the efficacy of such programs (Reschly & Christenson, 2006a). One attractive feature of the engagement construct is its alterable nature as a mediator between context and environment. Engagement research may, therefore, potentially provide interventionists with a mutable link between environmental contexts (e.g., families, schools, communities) and important outcomes (e.g., graduation, academic achievement). Taken together, the construct of student engagement may potentially facilitate accurate identification of students placed at risk under the alternative conceptualizations of risk (e.g., functional risk) that are intrinsic within the construct (Reschly & Christenson, 2006a).

The present study served to provide further provisional evidence towards using the scores obtained from the SEI-E as a valid indicator of self-reported cognitive and affective engagement with school among elementary age students. The current study sought to determine whether the construct of engagement in younger students is congruent with prevailing theory as conceptualized by SEI instrument designers (Appleton et al., 2006; Christenson et al., 2008; Reschly & Christenson, 2006a; Reschly & Christenson, 2012). To examine the latent structure of
the current SEI-E data, EFA and CFA were conducted on split-half samples of the data set. Four- and five-factor models were compared based on previous findings of psychometric examinations of the SEI (e.g., Appleton et al., 2006; Betts et al., 2010, Betts, 2012) and SEI-E (Carter et al., 2012) and model plausibility. Examination of the five-factor model revealed that goodness-of-fit criteria (e.g., CFI/TLI ≥.95) were met for acceptable model fit based on EFA analyses. Factor structure and item loading patterns, however, were less than optimal as three items failed to demonstrate salient loadings (Brown, 2006) onto any factor. Unexpectedly high correlations were also observed between factors in the five-factor model.

EFA results of the four-factor solution suggested that RMSEA, CFI, and TLI values also met goodness-of-fit criteria. Cleaner factor structure, however, was indicated as each item demonstrated salient rotated loadings onto a single factor (factor loading range= .44 to .83) after removing items related to CRSW. Parameter estimate results (e.g., direction, magnitude, significance of parameter estimates) demonstrated in the initial SEI-E validation study also hold true in the current study, providing further evidence towards plausibly retaining four factors.

To verify the appropriateness of concluding that the four-factor solution represents the best model fit for current SEI-E data, CFA was conducted on the second half of the dataset. Results suggest that the five-factor model demonstrated less than optimal fit as CFI and TLI values were bordering, or below, acceptable guidelines for goodness-of-fit (i.e., ≥.95). All model fit indices for the four-factor model, however, exceeded interpretation guidelines providing tentative statistical evidence that the latent structure of the current SEI-E data is best represented by four- factors: TSR, PSL, FGA, and FSL. These results are congruent with previous findings of initial validation research examining the psychometric properties of the SEI-E (Carter et al., 2012). Of note, further research is required before confident conclusions can be made regarding
the underlying structure of early student engagement. Instrument validation is an ongoing process and these initial studies are only the tip of the iceberg.

The SEI-E is intended to facilitate practical applications of student engagement theory. Plausible uses of the SEI-E include using obtained scores to identify students at risk for dropout, evaluate the effectiveness of dropout prevention and intervention programs, and monitor student engagement of levels individuals, classes, schools, and districts. Due to the intended purposes of the measure, interventionists and other stakeholders must be able to make valid inferences from SEI-E data and meaningfully compare measurements across relevant subgroups. To this end, measurement invariance analyses were undertaken to determine the extent to which scores function similarly across gender and FRL status using a multiple group confirmatory analytic approach (Betts et al., 2010).

Preliminary results indicate that configural invariance was obtained suggesting that the four-factor model structure demonstrated the same pattern of relationships with items across males and females. Similar results were also obtained regarding FRL status. Metric invariance, or the extent to which factor loadings and patterns are congruent across groups, was also examined. Partial metric invariance was also achieved in the current study, which is generally acceptable within the literature (Templin, 2012). These results are similar to those found in previous examinations of measurement invariance properties of the SEI (Betts et al., 2010) providing tentative evidence towards the utility of the current measure. Of note, substantial empirical investigation is required to defensibly argue for the appropriateness of procedures used in the present study as measurement invariance is an iterative process.

Finally, correlations were used to examine the associations between SEI-E factors and concurrent indicators of behavioral engagement (e.g., ODR, ISS) to provide evidence towards
concurrent validity of the instrument. Due to the skewed nature of behavioral variables, nonparametric correlations (i.e. Spearman’s Rho) were used to evaluate relevant relationships. Results revealed several small, statistically significant relationships between factor scores and behavioral indicators of engagement in the expected direction which is congruent with previous findings (Carter et al., 2012).

Taken together, current data tentatively suggest that Teacher- Student Relationships, Future Goals and Aspirations, as well as Peer and Family Support for Learning are relevant constructs when operationalizing early (i.e. elementary school) student engagement. Such findings are congruent with preliminary validation studies of the SEI-E (Carter et al., 2012) providing provisional confidence in the aforementioned theoretical model of student engagement with third through fifth graders. Although validation the SEI-E is still in the initial stages, the current study may provide additional insight into the theoretical underpinnings of student engagement, particularly with younger children. Definitional clarity of student engagement remains elusive; however, this study and its predecessors may assist in developing a cogent conceptualization of the construct based on sound empirical evidence and theoretical rationale.

Information regarding the developmental continuity (or discontinuity) of engagement is also essential. Ideally, a single measure of student engagement could be utilized across age-ranges; however, few measures currently facilitate such investigation. Should the SEI-E be found as a valid indicator of cognitive and affective engagement, this measure in conjunction with the SEI (middle and high school version) and SEI-C provides a viable starting point for developing a single broad measure of student engagement across all periods of education.

The SEI-E also presents as a potentially useful scale that may address the dearth of measures that assess early student engagement. Examining student engagement during the
formative years of education may be important based on the prevailing theory that establishment of engagement attitudes and dropout trajectories occur during early elementary school. As such, early identification of disengagement and dropout risk is likely effective and the SEI-E may be a valuable tool in this endeavor.

**Limitations**

The present study has the potential to provide a significant contribution to the study of elementary school student engagement. Of note, several limitations are worth mentioning regarding sample demographics, generalizability, and statistical methodology. The current study was conducted in a southeastern urban school district. Geographic and demographic variables such as proximity to major cities and institutions of higher learning, teacher-student ratios, the quality and quantity of educational resources, and the availability of extracurricular activities may moderate or mediate the relationship between elementary student engagement and relevant outcomes. Therefore further research should be conducted with students from rural locales and other regions of the U.S.

The current study included engagement data collected from ethnic minority students as well as English Language Learners whose ability to read, write, and perform academically is inhibited due to limited English proficiency. This proves problematic for several reasons. First, academic language proficiency takes several years to develop in non-native English speakers. Therefore, ELL students of elementary school age, although fluent in conversational English, may have had insufficient time or exposure to the curriculum to develop sufficient academic fluency to place confidence in their ability to validly read, understand, and complete a self-report measure. Second, individual characteristics of these students such as family involvement in academics, and expectations for achievement may impact how these students conceptualize, and
therefore, report student engagement. Although oral administration of the SEI-E may circumvent some of the limitations associated with limited English proficiency, cultural factors and differences have yet to be addressed.

Cultural and ethnic differences related to minority students present a similar limitation in generalizability of concluding that the current four-factor model is applicable to all students. Research suggests that several components of engagement vary in how they are conceptualized and experienced by African American students. For example, a recent study (Webb & Neuhrath-Pritchett, 2011) examined the factor structure and measurement invariance properties of the Student–Teacher Relationship Scale (STRS; Pianta, 2001) with African American and White elementary school-aged children. Tests of configural invariance and confirmatory factor analysis suggested that the three-factor model, as hypothesized by scale developers, was not applicable across the entire sample. In other words, differential factor models of student-teacher relationships and how this construct is conceptualized emerged across African American and White groups.

Similarly, research suggests that differences in environmental feedback, teacher expectations of relationships, relational negativity, and teacher interpretations of student behavior based on demographic and cultural characteristics (e.g., Hamre & Pianta, 2001; Kesner, 2000) mediate perceived closeness and warmth in the teacher-student relationship. Due to the inclusion of this variable in the proposed model of engagement, these pertinent factors should be considered in future research conceptualizing student engagement and determining the validity of using scores obtained from the SEI-E as a measure of this construct.

Although the current study provides preliminary evidence towards the internal and external validity of the SEI-E, future research should examine the predictive validity of the
instrument and correlations with distal outcomes (e.g., school completion, higher education). Third, correlations between SEI-E scores and external indicators of engagement (e.g., attendance, ODRs) were in the expected direction (e.g., higher ratings of engagement indicative of fewer ODRs); however, relationships were generally small in magnitude. Several additional caveats are noteworthy regarding using behavioral incidents and suspensions as an indicator of concurrent validity due to the small proportion of the sample with discipline infractions and the minimal variance associated with this indicator. Other external variables thought to correlate with student engagement (e.g., standardized achievement scores, engagement scores on well-validated instruments) would likely provide more statistically powerful analyses and practically relevant information. Such limitations certainly warrant further attention and inquiry regarding the utility of the instrument based on the intended use of the SEI-E and need for concurrent validity.

Lastly, further research should be conducted regarding the validity of the SEI-E and student engagement with specific subsets of students at risk for disengagement. For example, recent research suggests that cognitive and affective engagement is relevant themes in the school experiences of gifted underachievers and dropouts (Landis & Reschly, 2013). It may be possible, however, that certain factors (e.g., challenging nature of schoolwork, decreased boredom) may be pertinent factors underlying the construct of engagement with these students. The SEI-E may be a useful resource for explicating such differences, should they exist.

**Implications for Practice**

As mentioned previously, the construct of engagement is particularly attractive due to the alterable nature of related variables. Based on the current data, psychologists may examine school climate variables such as teacher-student relationships and issues related to school- family
partnerships (i.e., peer support for learning, family support for learning) when monitoring student engagement or attempting to develop effective dropout prevention and intervention programs. Focusing on the school climate factors that improve perceived levels of teacher-student relationships by implementing appropriate practices (e.g., class-wide or school-wide positive behavioral supports) is one practical example of how engagement data can be used to address areas of weakness that are engendering disaffection. Similarly, the efficacy of district-wide prevention efforts and well-established dropout prevention and intervention programs (e.g., Check & Connect) may also be evaluated via using SEI and SEI-E data as progress monitoring tools to determine the effect of student engagement programming and practices.

Evidence suggests that young students have already begun to forecast their educational futures and goals as early as third grade. Teachers, parents, and interventionists may capitalize on this by assisting students in developing attainable proximal and distal goals related to engagement and educational outcomes. Helping students develop engagement behaviors (e.g., school attendance, work completion, participation), cognitive processes (e.g., self-regulation, problem solving), and affective states (e.g., belonging in school) that underlie engagement may assist in the lessening the chasm between present dropout rates and the future aspirations of today’s youngsters. Incorporating authentic tasks and experiences that are applicable to student goals may also bolster engagement. Such simple changes may give students the gentle nudge that is needed to interrupt dropout trajectories established during early schooling. The potential applications of measuring student engagement are vast; however, well-established, theoretically sound measures are a necessary prerequisite. This study and related research may contribute to this effort.
Future Directions

The variability in engagement measures presents a significant challenge when comparing research findings in an effort to operationalize student engagement in a valid, yet parsimonious manner. Ideally, one measure could be used to evaluate engagement across development and contexts. This may facilitate additional longitudinal research and investigation of developmental changes in the construct. The SEI-E, SEI- and SEI-college version may be the starting point for synthesizing such a measure. Future research should examine correlations between SEI-E scores and distal outcomes (e.g., graduation status, enrollment in postsecondary school) as there is presently little data regarding long-term predictive validity. Further information regarding the correlation of the SEI-E with other concurrent indicators of school performance such as high-stakes assessment, grades, and homework completion is also needed.

The SEI-E is intended to measure the engagement of third through fifth graders; however, further invariance studies are needed before confidently generalizing SEI-E scores as indicative of engagement across such a large intersection of students. For example, students may undergo considerable changes in cognitive perceptions (e.g., relevance of schoolwork) and affective shifts (e.g., relationships with teachers over time). It is, therefore, plausible that the latent factor structure of engagement may vary depending on the maturational level of the student (Betts et al, 2010). Should this prove the case, different measures of engagement would be required to accurately capture the construct throughout development. In contrast, replication of the general factor structure across grades would provide evidence in support of the stability of student engagement throughout development (Betts, 2012). The current study demonstrated aspects of invariance across other demographic variables (i.e., gender and SES); however, invariance across development remains to be investigated. Similarly, invariance has yet to be address across other
demographic factors such as student ethnicity, cultural factors mentioned previously, and special education status. These limitations are worthwhile investigations in future psychometric studies.

Advanced measurement techniques examining the psychometric properties of measures of engagement are also needed (Betts, 2012). Initial validation (Carter et al., 2012) evidence in tandem with the current study provide a cursory investigation of the SEI-E, however, more sophisticated analyses are warranted before defensible and valid conclusions may be made regarding the psychometric properties of the SEI-E. Analysis logic procedures that include Item Response Theory and bifactor model methods (Betts, 2012) would contribute towards further inquiry into the psychometric properties of the SEI-E. Future research could include such measurement techniques.

Conclusions

The current study presented a plausible evaluative tool for assessing cognitive and affective student engagement based on the premise that this construct is a promising paradigm for conceptualizing and intervening upon the plague of early school withdrawal. The SEI and the SEI-E may provide psychologists with much needed tools to inform interventions to enhance student engagement and perhaps ameliorate the dropout crisis. The potential applications are poignantly illustrated in the following adage:

A villager is walking by the river early one morning. The villager looks out into the water and sees a baby floating down the river. Horrified, the villager races into the water, grabs the baby, and brings the baby to shore. The baby is fine. Relieved, the villager looks back into the water and sees another baby floating down the water. The villager again dives into the water and rescues this baby as
well. But the babies keep on coming... because no one is going upstream to put a
stop to the ogre that is throwing the babies into the water in the first place.

If we can identify and intervene upon the factors most responsible pushing students onto
the proverbial banks of early withdrawal, thousands of children may be saved from drowning in
the rushing currents of the river of dropout.
REFERENCES


http://psych.unl.edu/jtemplin/teaching/sem/sem12ersh8750/


APPENDICES

Appendix A.

*Comparison of item wording between the Student Engagement Instrument (SEI) and the Elementary Version (SEI-E)*

<table>
<thead>
<tr>
<th>Item</th>
<th>SEI</th>
<th>SEI-E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overall, adults at my school treat students fairly.</td>
<td>Adults at my school are fair towards students most of the time.</td>
</tr>
<tr>
<td>2</td>
<td>Adults at my school listen to the students.</td>
<td>Adults at my school listen to the students.</td>
</tr>
<tr>
<td>3</td>
<td>At my school, teachers care about students.</td>
<td>Teachers at my school care about the students.</td>
</tr>
<tr>
<td>4</td>
<td>My teachers are there for me when I need them.</td>
<td>My teachers are there for me when I need them.</td>
</tr>
<tr>
<td>5</td>
<td>The school rules are fair.</td>
<td>The rules at my school are fair.</td>
</tr>
<tr>
<td>6</td>
<td>Overall, my teachers are open and honest with me.</td>
<td>My teachers are honest with me.</td>
</tr>
<tr>
<td>7</td>
<td>I enjoy talking to the teachers here.</td>
<td>I like talking to the teachers here.</td>
</tr>
<tr>
<td>8</td>
<td>I feel safe at school.</td>
<td>I feel safe at school.</td>
</tr>
<tr>
<td>9</td>
<td>Most teachers at my school are interested in me as a person, not just a student.</td>
<td>Most teachers care about me as a person, not just a student.</td>
</tr>
<tr>
<td>10</td>
<td>The tests in my classes do a good job of measuring what I’m able to do.</td>
<td>The tests in my class do a good job of showing what I learned.</td>
</tr>
<tr>
<td>11</td>
<td>Most of what is important to know you learn in school.</td>
<td>School is where I learn important things.</td>
</tr>
<tr>
<td>12</td>
<td>The grades in my classes do a good job of measuring what I’m able to do.</td>
<td>The grades in my classes do a good job of showing what I am able to do.</td>
</tr>
<tr>
<td>13</td>
<td>What I’m learning in my classes will be important in my future.</td>
<td>What I learn in my classes will be important in my future.</td>
</tr>
<tr>
<td>14</td>
<td>After finishing my schoolwork I check it over to see if it’s correct.</td>
<td>After I finish my schoolwork, I check it to see if it is correct.</td>
</tr>
<tr>
<td>15</td>
<td>When I do schoolwork, I check to see whether I understand what I’m doing.</td>
<td>I make sure that I understand what I am doing when I do schoolwork.</td>
</tr>
<tr>
<td>16</td>
<td>Learning is fun because I get better at something.</td>
<td>Learning is fun because I get better at something.</td>
</tr>
<tr>
<td>17</td>
<td>When I do well in school it’s because I work hard.</td>
<td>When I do well in school it is because I work hard.</td>
</tr>
<tr>
<td>18</td>
<td>I feel like I have a say about what happens to me at school.</td>
<td>I have a say about what happens to me at school.</td>
</tr>
<tr>
<td></td>
<td>Other students at school care about me.</td>
<td>Other students care about me.</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>20</td>
<td>Students at my school are there for me when I need them.</td>
<td>Students at my school are there for me when I need them.</td>
</tr>
<tr>
<td>21</td>
<td>Other students here like me the way I am.</td>
<td>Other students here like me the way I am.</td>
</tr>
<tr>
<td>22</td>
<td>I enjoy talking to the students here.</td>
<td>I enjoy talking to the students here.</td>
</tr>
<tr>
<td>23</td>
<td>Students here respect what I have to say.</td>
<td>Students here respect what I have to say.</td>
</tr>
<tr>
<td>24</td>
<td>I have some friends at school.</td>
<td>I have friends at school.</td>
</tr>
<tr>
<td>25</td>
<td>I plan to continue my education following high school.</td>
<td>I plan to go to college after I graduate high school.</td>
</tr>
<tr>
<td>26</td>
<td>Going to school after high school is important.</td>
<td>Continuing to learn after high school is important.</td>
</tr>
<tr>
<td>27</td>
<td>School is important for achieving my future goals.</td>
<td>School is important for reaching my future goals.</td>
</tr>
<tr>
<td>28</td>
<td>My education will create many future opportunities for me.</td>
<td>My education will create many chances for me to reach my future goals.</td>
</tr>
<tr>
<td>29</td>
<td>I am hopeful about my future.</td>
<td>I am hopeful about my future.</td>
</tr>
<tr>
<td>30</td>
<td>My family/guardian(s) are there for me when I need them.</td>
<td>My family/guardian(s) are there for me when I need them.</td>
</tr>
<tr>
<td>31</td>
<td>When I have problems at my school my family/guardian(s) are willing to help me.</td>
<td>When I have problems at my school my family/guardian(s) are ready to help me.</td>
</tr>
<tr>
<td>32</td>
<td>When something good happens at school, my family/guardians want to know about it.</td>
<td>My family/guardian(s) want to know when something good happens at school.</td>
</tr>
<tr>
<td>33</td>
<td>My family/guardian(s) want me to keep trying when things are tough at school.</td>
<td>My family/guardian(s) want me to keep trying when things are tough at school.</td>
</tr>
<tr>
<td>34</td>
<td>I’ll learn, but only if my family/guardian(s) give me a reward. (Reversed)</td>
<td>I will learn only if my parent/guardian(s) give me a reward. (Reversed)</td>
</tr>
<tr>
<td>35</td>
<td>I’ll learn, but only if the teacher gives me a reward. (Reversed)</td>
<td>I will learn only if my teacher(s) give(s) me a reward. (Reversed)</td>
</tr>
</tbody>
</table>

Note: SEI items published in Appleton et al., 2006; SEI-E items included in Carter et al., 2012