MEASUREMENT OF STUDENT ENGAGEMENT IN EARLY ELEMENTARY SCHOOL

by

ANNA GOODBREAD WRIGHT

(Under the Direction of Amy L. Reschly)

ABSTRACT

Research on student engagement, which emerged in response to the costly issue of high school dropout, emphasizes the developmental nature of and contextual influences associated with the decision to leave school prematurely (Finn, 1989; Rumberger, 2011; Reschly & Christenson, 2006). Although several demographic groups are at heightened risk for dropping out, student engagement research focuses on variables that differentiate risk and on variables that are alterable and amenable to intervention and prevention efforts (Christenson, 2008; Reschly & Christenson, 2012). This dissertation provides a comprehensive overview of dropout and student engagement research, and reviews relevant literature on the definitions, measurement, and developmental considerations of the engagement construct. In light of research emphasizing the importance of early school experiences on distal outcomes, the Student Engagement Instrument – Elementary Version, Second Edition (SEI-E2) is presented as a plausible measure of engagement for students in first and second grade (Alexander, Entwistle, & Horsey, 1997; Christenson & Thurlow, 2004). Currently, research is lacking on the nature and measurement of engagement with young children, and the SEI-E2 was created to address this need. The psychometric properties of the SEI-E2 are reviewed to evaluate continuity in engagement throughout elementary school. Results and findings of the current study provide initial evidence

of continuity in the engagement construct throughout elementary school, and highlight developmental changes in the influence of factors on engagement for young students. Limitations of the current study, directions for future research, and implications for this work are also addressed.

INDEX WORDS: Student engagement, Dropout, Early elementary school, SEI

MEASUREMENT OF STUDENT ENGAGEMENT IN EARLY ELEMENTARY SCHOOL

by

ANNA GOODBREAD WRIGHT

B.A., Augusta University, 2010

M.A., University of Georgia, 2012

A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2017

MEASUREMENT OF STUDENT ENGAGEMENT IN EARLY ELEMENTARY SCHOOL

by

ANNA GOODBREAD WRIGHT

Major Professor:	Amy L. Reschly
Committee:	Scott P. Ardoin
	Jennifer H. Lindstrom
	Stacey Neuharth-Pritchett

Electronic Version Approved:

Suzanne Barbour
Dean of the Graduate School
The University of Georgia
December 2017

DEDICATION

This dissertation is dedicated to those who have encouraged and supported me along the way. To my Dad, who always told me to be the Doctor and not to just marry one, and to my Mom, who always believed I could do anything I set my mind to, this work is without a doubt dedicated to you. Without your love and support, I would never have set out on this journey, much less reached the finish line. To my Husband, Drew, who is the calm to my crazy, and helps me keep my feet on the ground and head held high, thank you for keeping life in perspective and for making it all worth it. To all of my family and friends, thank you for standing by me and for believing in me even when my belief in myself may have fallen short.

ACKNOWLEDGEMENTS

First and foremost, thank you to Dr. Amy Reschly for giving me the chance to begin the School Psychology program, for your total support and guidance throughout my training, and for seeing me through on this dissertation. Thank you to Dr. Stacey Neuharth-Pritchett for the multiple opportunities and the wealth of knowledge you have given me. The confidence you both have shown in me has played an integral role in my success and the professional I am today. Thank you to Gwinnett County Public Schools for facilitating this study and to Jue Wang for your statistical guidance and expertise. Last but certainly not least, thank you to my dissertation committee for your time and invaluable feedback on this study.

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

Often referred to as a national epidemic (Education Week, 2010), high school dropout is a severe and costly issue associated with a plethora of negative outcomes. Federal and state initiatives have targeted the dropout crisis for decades and recent growth in graduation rates is promising. Despite a recent 6% increase in the number of students who graduate high school today compared to a few years ago, nearly 20% of students continue to leave school prematurely (DePaoli et al., 2015; Snyder & Dillow, 2015). Contributing to the urgency of dropout prevention and intervention efforts are data that have established correlations between dropout and significant economic and social burdens (Rumberger, 2011). At both the individual level and for society at large, high school dropout has far-reaching consequences that include lower income and national revenues, increased reliance on government assistance programs, poorer health outcomes, and increased incarceration rates [(Alliance for Excellent Education (AEE), 2011; Rumberger & Rotermund, 2012; Sum, Khatiwada, McLaughlin & Palma (2009)].

Interest in and research on dropout has spanned more than a complete century (Barclay & Doll, 2001). Initial investigations into dropout were largely concerned with identifying groups of students most at-risk for dropping out; subsequently, variables have been identified at the individual, family, and school levels that contribute to dropout risk (Reschly & Christenson, 2006). Although certain demographic groups have consistently higher dropout rates, including ethnic minorities and students from low-income backgrounds, research has shown that status variables do not completely account for dropout risk (Finn, 1989, 1993; Christenson et al., 2001;

Rumberger & Lim, 2008). Consequently, numerous theoretical models have been posited to explain why some students are more likely to dropout than others.

Seminal work on dropout by Finn (1989) introduced the concept of dropout as a developmental process. Finn's (1989) participation-identification model (PI) conceptualizes dropout as a process that occurs over time, instead of a one-time event, and outlines the processes underlying school identification or withdrawal. According to the PI model, the relationship between behavior and affect has a resulting influence on academic performance (Finn, 1989; Finn & Zimmer, 2012). Finn's (1989) theory focused on how students think and feel about school (identification) and how this impacts and is impacted by participation in school activities. Importantly, variables identified as critical in the dropout process are alterable and can be targeted with intervention.

In addition to the PI model (1989), researchers across disciplines have proposed models and theories in attempts to explain the dropout phenomenon. Although conceptual models of dropout differ in various ways, they are similar in that each acknowledges the importance of multiple factors in contributing to the complex process underlying school withdrawal (Rumberger, 1987; Rumberger & Rotermund, 2012). The construct of student engagement, which first emerged in the research literature in the 1980's, has gained momentum among researchers as the cornerstone of dropout prevention and intervention efforts (Appleton, Christenson, & Furlong, 2008; Christenson, 2008; Reschly & Christenson, 2012). Student engagement resonates with researchers, educators, families, and students as an important component of school success (Appleton et al., 2008). Although definitional clarity and measurement issues surround the engagement construct, there is consensus that student engagement is multidimensional and malleable, characteristics that contribute to its widespread

appeal (Appleton et al., 2008; Fredericks, Blumenfield, & Paris, 2004; Reschly & Christenson, 2012).

Although many agree on the multidimensionality aspect of engagement, researchers disagree on the number and subtypes of engagement. Based on their work with a dropout intervention program, Christenson and colleagues proposed four subtypes of engagement: academic, behavioral, cognitive, and affective (Reschly & Christenson, 2006, 2012). Within this model, behavioral and academic engagement represent external indicators of engagement that are easily observable (Appleton et al., 2008). Conversely, cognitive and affective engagement represent internal subtypes of engagement and are much more difficult to measure. Differences in conceptualizations of engagement have resulted in heightened confusion surrounding internal indicators of engagement, including measurement issues and theoretical differences from motivation (Appleton et al., 2006; Betts, 2012; Reschly & Christenson, 2012).

Numerous methods and measures of engagement have been proposed (see Fredericks et al., 2011; Fredericks & McColskey, 2012). Assessment of the internal subtypes of engagement (e.g., cognitive and affective) must be assessed from the student's perspective; therefore, self-report measures are most often used (Appleton et al., 2006; Fredericks & McColskey, 2012). Specifically designed by Appleton and colleagues (2006) for this purpose, the Student Engagement Instrument (SEI) can be used along with other indicators of engagement (i.e., behavioral and academic) to identify students that may benefit from engagement-based interventions (Appleton et al., 2006; Betts, Appleton, Reschly, Christenson, & Huebner, 2010; Lovelace, Reschly, Appleton, Lutz, 2014). Accurate measurement of engagement is important both for identifying students at-risk for dropping out and as an indicator of academic success for

all students (Christenson, Reschly, & Wylie, 2012; Christenson & Thurlow, 2004; Finn & Zimmer, 2012).

Research conducted with the SEI and its extensions has found evidence of reliability and validity for use with students in upper elementary school through college (Appleton et al., 2006; Betts et al., 2010; Carter, 2013; Carter et al., 2012; Grier-Reed, Appleton, Rodriguez, Ganuza, & Reschly, 2012; Lovelace et al., 2014; Waldrop, Reschly, Fraysier, Appleton, 2016). Studies examining the factor structure of the SEI have revealed five- and six-factor models: three factors representing affective engagement and two to three factors representing cognitive engagement for students in grades 6 through 12 (Appleton et al., 2006; Betts et al., 2010). Teacher-Student Relationships (TSR), Family Support for Learning (FSL), and Peer Support for Learning (PSL) are factors measuring affective engagement; Future Goals and Aspirations (FGA), Control and Relevance of School Work (CRSW), and, in six-factor models, Extrinsic Motivation (EM), measure cognitive engagement. Importantly, research at the elementary- and college-levels has revealed factor models discrepant from those identified in original SEI studies. The Student Engagement Instrument – Elementary Version (SEI-E), designed for use with students in grades three through five, revealed a four-factor model: FGA, PSL, TSR, and FSL (Carter et al., 2012). At the college level, four- and five-factor models have been proposed (Grier-Reed et al., 2012; Waldrop et al., 2016).

An important endeavor for student engagement researchers is continued scholarship examining the continuity or discontinuity of the construct across developmental periods, which will critically inform interventions targeting specific age-groups. Engagement research is heavily grounded in theory that acknowledges the developmental nature of engagement and dropout risk; however, empirical data are lacking at the most fundamental age of schooling, early

elementary school (Finn, 1989; 1993; Christenson & Reschly, 2010). Early school experiences are crucial due to their impact on future school experiences, including school identification, withdrawal, and the decision to drop out (Alexander, Entwisle, & Horsey, 1997; Rumberger & Rotermund, 2012). Research has shown that behavioral indicators of engagement are evident as early as first grade (Alexander et al., 1997; Rumberger & Lim, 2008). Therefore, the Student Engagement Instrument – Elementary Version, 2nd Edition (SEI-E2) was designed as a self-report measure of cognitive and affective engagement for first and second grade students. The current study sought to examine the underlying psychometric properties of the SEI-E2 and the utility of the measure to assess engagement during the formative years of schooling.

The following chapters provide a comprehensive overview of relevant literature, explicate the research design of the current study, and discuss the results and implications of the findings. Chapter 2 serves as a review of existing literature on the current state and consequences of dropout, theories and conceptual models of dropout, an overview of the construct of student engagement, theoretical and measurement issues, and the importance of early identification and intervention for students at-risk for disengagement and dropping out. A review of existing engagement measures and validity evidence of popular engagement measures is also provided. Within Chapter 2, particular emphasis is placed on research highlighting the developmental nature underlying student engagement. Chapter 3 provides justification for research questions to be addressed and specific methods that were followed. Specifically, connections are drawn between research on early school experiences and later outcomes that support the importance of measuring engagement in early elementary school and presents the SEI-E2 as a potentially viable tool to fit this need. Results of the study are presented in Chapter

4 and Chapter 5 integrates previous research with findings of the current study. Finally, limitations of the study and suggestions for future research are provided.

CHAPTER 2

REVIEW OF THE LITERATURE

The Current State of Dropout and Consequences of Early School Withdrawal

Long considered a national obsession (Finn, 1989), numerous federal and state initiatives have targeted dropout or high school completion rates. In February 1989, President Bush put forth national education goals that included reaching a 90% high school graduation rate. Despite several years of stagnant graduation rates, recent reports suggest that progress is finally being made. Data from the U.S. Department of Education's National Center for Education Statistics (NCES) revealed increases in high school graduation rates for three consecutive years with a record high of 81% in 2013 (Snyder & Dillow, 2015). In 2015, high school graduation rates reached a new record of 81.4% (DePaoli et al., 2015). The Grad Nation campaign by American's Promise Alliance reported that, according to these recent graduation trends, the goal to reach a 90% nationwide graduation rate by 2020 is obtainable (DePaoli et al., 2015). In order for this to be accomplished, educational policies and reform efforts must draw upon empirical research and interventions that target students at-risk for dropping out.

Concern for high school completion and dropout is not new and has dominated educational reform efforts for several decades (Reschly & Christenson, 2012; Rumberger, 2011). Despite past efforts to decrease dropout, a staggering number of students continue to leave school prematurely. According to national statistics, a student drops out of school every 26 seconds, which equates to over one million students each year (Education Week, 2010). Although overall graduation rates have experienced a recent positive trend, certain demographic

groups continue to experience disproportionately lower graduation rates. Children who are statistically at-risk for poorer outcomes in general, such as those belonging to racial and ethnic minorities and/or those from low socioeconomic backgrounds, are also more likely to drop out of school [Alliance for Excellent Education (AEE), 2011; Ingels & Dalton, 2013]. A longitudinal study that followed a cohort of 9th graders through four years of high school found that Black and Hispanic students had higher rates of dropout than White students; Asian students had the lowest rates (Ingels et al., 2013). Other national reports and research findings have identified similar and additional demographic variables that are associated with higher rates of dropout, including being male, older than typical for grade level, and having a disability (AEE, 2011; Reschly & Christenson, 2006b).

Importantly, within group differences often outweigh between group differences on various outcomes, including school completion and dropout. Instead of being causal in nature, demographic variables that amalgamate with other known risk variables perpetuate the likelihood for more negative outcomes, resulting in cumulative risk. Status variables such as age, gender, disability status and socioeconomic status are by definition static and cannot be changed. Alterable variables, such as grades, school climate, and sense of belonging, however, are associated with risk for dropout and can be targeted with intervention (Christenson, Sinclair, Lehr, & Godber, 2001). This important distinction shifts attention away from status (fixed) variables to those that are alterable and amenable to intervention; thus, emphasizing the significance of context in dropout prevention and intervention efforts (Reschly & Christenson, 2012).

The importance of graduating high school is highlighted against the significant social and economic burdens associated with dropout (Rumberger, 2011). Economically, students who

drop out of school face an austere future; they are less likely to be employed and earn less than their educated peers (AEE, 2011; Rumberger & Rotermund, 2012; Sum, Khatiwada, McLaughlin, & Palma, 2009). In 2008, the median annual earnings of individuals who dropped out of high school were 28% less than those who graduated (Rumberger & Rotermund, 2012). Given the financial deficit dropouts contribute to the national economy, it is projected that the costs associated with dropout will result in an approximate $1.5 trillion dollar loss between 2011 and 2021 (AEE, 2011). In an age where the standards of educational attainment continue to rise, the consequences of not obtaining postsecondary education are amplified. Research has revealed that high school dropouts are less likely to enroll in postsecondary education; therefore, the economic gap for dropouts continues to widen (Heckman & LeFontaine, 2010; Kirsch, Braun, Yamamoto, & Sum, 2007; Rumberger, 2011).

In addition to the negative outcomes dropouts face, the consequences of dropout extend to society at large. Lower earnings result in fewer contributions to local, state, and national economies (Rumberger & Rotermund, 2012) and in heightened dependence on government assistance programs (AAE, 2011). Research has shown strong correlations between dropping out of high school and an increased likelihood for incarceration and poorer health outcomes, lending to high costs to society (Rumberger, 2011; Sum et al., 2009). Furthermore, high school dropouts are less likely to excel in productivity, lending additional concern for our nation's ability to compete in an increasingly global economy (AAE, 2011, Kirsch et al., 2007). Together, these findings lead to the conclusion that efforts to decrease dropout can have extensive economical and societal impact that reach far beyond individuals at-risk for dropping out.

Past Research & Conceptual Models of Dropout

Initial research and concern for dropout in the United States can be traced to the early 1900's (Barclay & Doll, 2001). From the 1900's until 1949, more students dropped out of school than graduated (Smith, 1943, as cited in Barclay & Doll, 2001). During this period, researchers relied chiefly on demographic characteristics, such as socioeconomic status and parent occupation(s), in their attempts to explain why some individuals were more likely to dropout than others (Barclay & Doll, 2001). After 1950, when more students were graduating than dropping out, and a high school diploma became increasingly necessary to obtain work, the importance of preventing dropout was echoed throughout the nation by local and national policy makers (Barclay & Doll, 2001; Doll & Hess, 2001). Although the majority of research studies continued to rely on demographic variables, some researchers began conducting prospective studies in which intraindividual (cognitive, social, and emotional) and environmental characteristics were also examined (Barclay & Doll, 2001).

Pre-1970's empirical studies were instrumental in shaping contemporary conceptualizations of dropout. These early studies revealed that indicators of dropout emerge in elementary school and extend beyond status variables to include individual- and school-level variables (Barclay & Doll, 2001; Christenson et al., 2001). Based on the knowledge that status variables alone do not fully account for dropout risk, modern-day researchers are encouraged to examine more than demographic variables in their work on dropout prevention and intervention, such as educational performance, behaviors, and attitudes (Rumberger & Lim, 2008). By doing so, researchers are better equipped to account for meaningful within-group differences that represent important indicators of risk and targets for intervention.

Christenson (2008) offered a distinction among variables that differentiate risk for dropout: demographic vs. functional risk factors. Functional risk factors are defined as those that differentiate dropout risk within and across demographic groups. Furthermore, functional risk variables, such as attendance and behavior, are highly predictive in nature and can be targeted with intervention (Reschly & Christenson, 2012). Targeting students for intervention using an identification process focused on functional risk, as opposed to demographic factors alone, better distinguishes those at greater risk for dropping out. Other distinctions have also been made (See Figure 1). For example, Reschly and Christenson (2006a) identified variables at the student, family, and school levels that can serve as risk and/or protective factors and Jordan, McPartland, and Lara (1996) described school-level variables that either push students away from or pull them out of school (push/pull effects). Efforts to uncover the multiple factors that influence an individual's decision to leave school prematurely have identified several factors external to the individual that can be targeted with intervention. These external, or contextual, factors have been further categorized as proximal and distal (Rumberger, 1987). Although proximal factors are more directly related to the individual (e.g., attitudes, behavior, and school performance), distal factors are also important and include factors found in students' families, schools, and wider communities (Rumberger, 1987, 2011).

Together, distinctions made among variables and descriptors of factors associated with dropout lend understanding to the point that there is no single factor that best predicts dropout. Instead, multiple individual-level and environmental or contextual factors influence a student's decision to leave school prematurely (Reschly & Christenson, 2012). Conceptual models that are based on an ecological approach, which considers the complex interactions of the contexts in which a student exists, more accurately capture the complexity associated with dropout risk

Figure 1.

Table 1.1 Categorizations of variables predictive of high school dropout and completion

Nonschool correlates (Rosenthal, 1998)		Status variables (Reschly & Christenson, 2006b)
SES *Minority group status* *Gender* Males slightly more likely to drop out *Community characteristics* Dropout more likely in urban areas, Southeastern and Western USA, poorer communities, single-parent families, nonwhite communities, communities with high rates of foreign-born individuals *Household stress* Several stress variables related to dropout (e.g., single parenting, substance abuse, mobility, neighborhood violence) *Taking adult roles* Teen pregnancy, employment, other adult responsibilities *Social support for staying in school* Valuing education by parents and peers reduces likelihood of dropout (e.g., parental expectations and achievement)	*Family process* Those with parental involvement and monitoring less likely to drop out *Student involvement with education* Dropouts have lower aspirations and achievement, less participation, etc. *Social conformity vs. autonomy* Dropouts have a higher need for autonomy, less conformity and less accepting of authority, lower church involvement, etc. *Social deviance* Dropouts more likely to be deviant (e.g., substance abuse, conduct disorder, runaway) *Personality* Dropouts have lower self-esteem and confidence, more impulsive, difficulty communicating, etc.	*Dropout* Low SES Reside in southeastern and western regions of the USA Students with disabilities English language learners From Native American, Hispanic, or Black racial/ethnic backgrounds

Alterable variables (Reschly & Christenson, 2006b)
By context

	Protective	Risk
Student	Complete homework Come to class prepared High locus of control Good self-concept Expectations for school completion	High rates of absences Behavior problems Poor academic performance Grade retention Working
Family	Academic support (e.g., help with homework) and motivational support (e.g., high expectations, talk to children about school) for learning Parental monitoring	Low educational expectations Mobility Permissive parenting styles
School	Orderly school environments Committed, caring teachers Fair discipline policies	Weak adult authority Large school size (>1,000 students) High pupil–teacher ratios Few caring relationships between staff and students Poor or uninteresting curricula Low expectations and high rates of truancy

Push	*Pull* (Jordan, McPartland, & Lara, 1999)	Proximal	*Distal* (Rumberger, 1995)
Conditions or events in the school environment that push kids out (e.g., disciplinary policies, grade retention)	Events or conditions outside of school that pull kids away (e.g., caring for a family member, having to get a job).	e.g., school attendance and behavior	e.g., family background, early school experiences

	Demographic risk variables	*Functional risk* (Christenson, 2008)
	SES, disability or English learner, status, race/ethnicity, etc.	Attendance, behavior, academic performance, credits earned, low levels of participation, etc.

Sources: Rosenthal (1998); Reschly and Christenson (2006b); Jordan et al. (1999); Rumberger (1995); Christenson (2008)

Note: Figure published in Reschly & Christenson, 2012.

(Bronfenbrenner, 1992; Reschly, 2011; Rumberger & Rotermund, 2012). Conceptual models vary in the number and types of factors they include, but are similar in that they acknowledge the interplay of multiple factors and processes over time that contribute to a student's decision to dropout (Rumberger, 1987; Rumberger & Rotermund, 2012). These various models (e.g., Finn's participation-identification model, life course models, Tinto's model, Wehlage and colleagues' model, and models of deviance) all suggest that the decision to dropout is precipitated by a multifaceted and complex process that occurs over time (Finn, 1989, 1993; Finn & Zimmer, 2012; Rumberger & Rotermund, 2012). In other words, dropout does not result from one event at one period in time (Finn, 1989). Therefore, preventive and intervention efforts to decrease dropout risk should seek to identify students as early as possible by including indicators of functional risk that are developmentally appropriate (Reschly, 2011; Reschly & Christenson, 2012).

Theories and Models of Dropout and Engagement

Participation-Identification Model. Finn's (1989) seminal work on dropout focuses on developmental processes underlying the decision to drop out. According to Finn (1989), the decision to drop out is preceded by several events that often begin in the early years of schooling and result in withdrawal from school. Finn's conceptualization of dropout is largely influenced by research showing an association between problem behaviors and school failure (Finn, 1989) and emphasized the interdependence between school performance and behavior. Finn's work was also influenced by research on the importance of attachment to school; he explained the relationship between school performance and behavior by explicating psychological processes that are involved (Finn, 1989). His model, the participation-identification (PI) model, specifically focuses on the relationship between behavior and affect and its impact on academic

performance (Finn, 1989; Finn & Zimmer, 2012). The PI model also highlights the importance of variables that are alterable, including participation in school activities and quality instruction (Appleton, Christenson, & Furlong, 2008).

Finn's (1989) PI model takes into account individual and contextual influences that promote attachment to school, or what he termed identification. According to the PI model, successful participation in school activities impacts individuals affectively by leading to increased feelings of attachment to and valuing of school (Finn, 1989; Finn & Zimmer, 2012). The PI model suggests a cycle that begins with participatory (external) behaviors that lead to increased bonding and identification with school (internal) that results in continued participation. The behavioral component of Finn's (1989) model, participation, is explained in four levels of increasingly effortful participatory behaviors that are expected as children mature.

At the most basic level, level-one, participation refers to behaviors that convey a readiness and willingness to learn. Level-one behaviors, which are expected in the early (primary) schooling years, require little effort and come naturally to most children (Finn, 1989; Finn & Rock, 1997). Some children, such as those with less supportive families, however, may enter school predisposed for nonparticipation and nonidentification (Finn, 1989; Finn & Zimmer, 2012). This emphasizes the importance of quality classroom and school environments that support children of various backgrounds and ability levels to promote successful early school experiences. Research has shown that children's early school experiences provide a critical foundation for future academic and social trajectories (e.g., McCabe & Altamura, 2011; Mirkhil, 2010). Early interventions are especially important for children at-risk for difficulties in school (e.g., those who exhibit early problem behaviors). By intervening early, the likelihood of less successful early school experiences resulting in persistent and negative emotional ties with

school is decreased (Finn & Zimmer, 2012). Additionally, effective early interventions afford more opportunities for participatory behaviors to occur, thus promoting students' identification with school (Reschly & Christenson, 2012).

Level-two participation is characterized by increased enthusiasm about school. Finn (1989) described level-two participatory behaviors as those that go above and beyond minimal requirements and eventually culminate in involvement in extracurricular school activities (e.g., school clubs). Through voluntary participation in additional school activities, students are more likely to form identities that include their involvement at school. Consistent with Finn's (1989, 1993) notion that attachment to school is developmental, level-three participation is described as that which occurs as children mature and have greater control over and more opportunities for various school-related activities. Level-three participation is theorized to result in greater feelings of belongingness and hence stronger identification with school (Finn, 1989; Finn & Rock, 1997). Lastly, level-four participation has been proposed as particularly important for children most at-risk for nonparticipation and nonidentification. Level-four participation requires students to become active participants in school-based decisions, whether at the individual, class, or overall school level. Conversely, participation in school-based decisions is speculated to promote feelings of empowerment that may counteract the sense of alienation associated with dropout risk (Finn, 1989). Research has shown correlations between feelings of alienation, or a low sense of belonging, and risk for dropout (Appleton et al., 2008; Finn, 1989; Goodenow, 1981).

Finn's (1989) PI model was seminal to understanding dropout and the field of student engagement in several ways. In addition to providing insight into how students at-risk for poor educational outcomes behave and feel throughout the process of withdrawing from school (Finn

& Zimmer, 2012), the PI model offered a conceptualization of the developmental process underlying dropout. Knowledge of the developmental process of dropping out allows for early identification of and targeted intervention for students at-risk for dropping out. Furthermore, the PI model acknowledged that students who drop out can be identified early, which highlights the importance of targeted intervention efforts across developmental periods. The behavioral and affective components of Finn's model alluded to targetable indicators of functional risk (both individual and contextual) that could be incorporated into interventions and school reform efforts (Appleton et al., 2008; Christenson et al., 2008).

Self-System Processes. Intrapersonal factors that contribute to dropout risk were examined in the self-system process model proposed by Connell and Wellborn (1991). According to this model, individuals have basic needs for competence, autonomy, and relatedness (Connell & Welborn, 1991). As students navigate schooling, constant evaluations considering how these basic needs are being met occur via cognitive evaluations of the self compared to external circumstances (Finn & Zimmer, 2012). When these appraisals, or self-system processes, indicate the aforementioned psychological needs are not being met, individuals are thought to react positively through increased engagement or negatively by distancing themselves from school (Connell & Wellborn, 1991; Skinner & Pitzer, 2012). Connell and Wellborn's (1991) model has inspired more recent research on how these internal appraisals are integral to motivation, and, hence, outcomes of interest. Motivational models view self-system processes as the foundation of motivation that subsequently impacts engagement or disengagement and leads to either positive or negative educational outcomes (Skinner & Pitzer, 2012). As such, self-system processes and motivational models of

engagement stress the importance of school practices that foster competence, autonomy, and relatedness (e.g., high quality instruction and positive student-teacher relationships).

The common theme among these models is that intraindividual and contextual factors contribute to academic success. Finn's PI model, which parallels important characteristics of the Connell and Wellborn (1991) model and other motivational models of engagement, summarizes the interplay between behavior and affect in contributing to educational outcomes. The cyclical nature of the PI model delineates pathways to engagement or disengagement with school. Student engagement, which emerged in the 1980's as a way to conceptualize and reduce dropout, boredom, and student alienation, is the underlying essential component in each of these models and is useful for capturing the process underlying the decision to drop out of school (Appleton et al., 2008; Finn & Zimmer, 2012). Since its inception in these early models, student engagement has evolved into the central construct for understanding and addressing dropout, high school reform, and as an important indicator of academic success for all students (Christenson, Reschly, & Wylie, 2012; Christenson & Thurlow, 2004; Finn & Zimmer, 2012).

Student Engagement: Conceptual Models and Issues

Student engagement first emerged in a review of literature in the 1980's (Mosher & McGowan, 1985). Most student engagement researchers view Finn's (1989) paper as pivotal in sparking widespread interest in and research on engagement. The approximate 25-year history of engagement research has validated the construct's relevance to educational outcomes for both students at-risk for poor outcomes (e.g., dropping out) and for all students in general (Christenson et al., 2012; Klem & Connell, 2004). Student engagement, which resonates with educators, researchers, families, and students as an important component of academic success (Appleton et al., 2008), has been conceptualized and operationalized in somewhat dissimilar

ways. Although consensus has been reached on some aspects of engagement, definitional clarity and construct validity have yet to be achieved and remain pressing endeavors for future research (Appleton et al., 2008; Christenson et al., 2012; Lovelace, Reschly, Appleton, & Lutz, 2014). Research that addresses these limitations is requisite to the advancement of the student engagement construct and its applicability to intervention and preventive efforts (Christenson et al., 2012).

Student engagement was originally conceptualized via models based on dropout, whereas contemporary conceptualizations view it as the basis of high school reform and intervention efforts and as a critical factor in promoting enrollment in post-secondary education (Appleton et al., 2008; Christenson et al., 2012; Fredericks, Blumenfield, & Paris, 2004). Across these efforts, student engagement is described as the central force that can improve student outcomes across academic, social, behavioral, and emotional domains (Reschly & Christenson, 2012). This more recent engagement work has shifted focus from preventing dropout to promoting school completion, which requires more than simply staying in school and reflects a more positive orientation (Christenson et al., 2001; Christenson & Thurlow, 2004; Reschly & Christenson, 2006a). School completion requires skills to successfully navigate educational demands and the school environment, relationships that promote school-based participation and learning, and future-oriented thinking that underscores the connection between school and future outcomes (Reschly & Christenson, 2012).

Consistent with early conceptualizations of engagement that emphasized the relative contributions of intraindividual and contextual factors, student engagement was recently described as the glue that connects contexts to students and, successively, to outcomes of interest (Reschly & Christenson, 2012). Also in line with early research on engagement, current

conceptualizations focus on the alterable nature of engagement variables (see Christenson, 2008) and acknowledge the developmental nature underlying the engagement process (Christenson & Reschly, 2010). From this standpoint, indicators of withdrawal often begin in early elementary school and may change as students progress through school (Christenson & Thurlow, 2004). The malleable nature of the student engagement construct alludes to its promise as the cornerstone of the most promising dropout prevention and intervention efforts (Christenson et al., 2008; Reschly & Christenson, 2012).

Despite the lack of consensus surrounding definitions of and how engagement is operationalized and measured, researchers agree that the engagement construct is multidimensional (Appleton et al., 2008; Fredricks et al., 2004; Reschly & Christenson, 2012). Differences in how engagement is defined and the number and nature of engagement subtypes or components are the greatest sources of contention in student engagement research (Appleton et al., 2008; Fredericks et al., 2004; Jimerson, Campos, & Greif, 2003). Although some have proposed the potential of engagement as a metaconstruct that unites separate lines of research (Fredericks et al., 2004), inconsistencies in how engagement is defined, operationalized, and measured maintain limitations in the advancement of student engagement research (Betts, 2012). Until the aforementioned limitations are addressed, authors of each study must define their conceptualizations of engagement clearly (Appleton et al., 2008; Christenson et al., 2012).

Even with agreement on the multidimensionality of engagement, researchers disagree on the number and types of engagement it subsumes. Most researchers espouse two or three component models of engagement (Appleton et al., 2008). Similar to Finn (1989), most researchers who promote two-component models include behavioral and affective subtypes. Behavioral engagement includes indicators such as participation in school-based activities

(classroom and extra-curricular activities), attendance, and rule-following behavior (Christenson et al., 2008; Lovelace et al., 2014). Affective, or emotional engagement, represents internal or emotional experiences with school such as a sense of identification, bonding, and interest with school (Appleton et al., 2008; Christenson et al., 2008; Lovelace et al., 2014).

A third and additional component, cognitive engagement, has been included in more recent engagement conceptualizations (Appleton et al., 2008; Christenson et al., 2008; Fredericks et al., 2004; Fredericks & McColskey, 2012; Jimerson et al., 2003). The addition of a cognitive subtype of engagement reflects ideas from Connell and Wellborn's (1991) self-system process model. The self-system process model distinguishes self-evaluations of how well the fundamental human needs of autonomy, competence, and relatedness are met through experience as the impetus underlying actions that determine the respective processes of engagement or disaffection (Appleton et al., 2008; Skinner & Pitzer, 2012). These self-evaluations, or self-system processes, result in persistent beliefs that influence action and subsequent outcomes. When needs are met, students are purported to view themselves positively, which encourages engagement; adversely, when needs are not met, individuals distance themselves through the process of disengagement (Skinner & Pitzer, 2012). Therefore, the inclusion of a cognitive subtype of engagement acknowledges the importance of cognitive factors such as self-regulation, learning goals, and perceived ability in overall engagement (Christenson et al., 2008; Fredericks & McColskey, 2012; Jimerson et al., 2003).

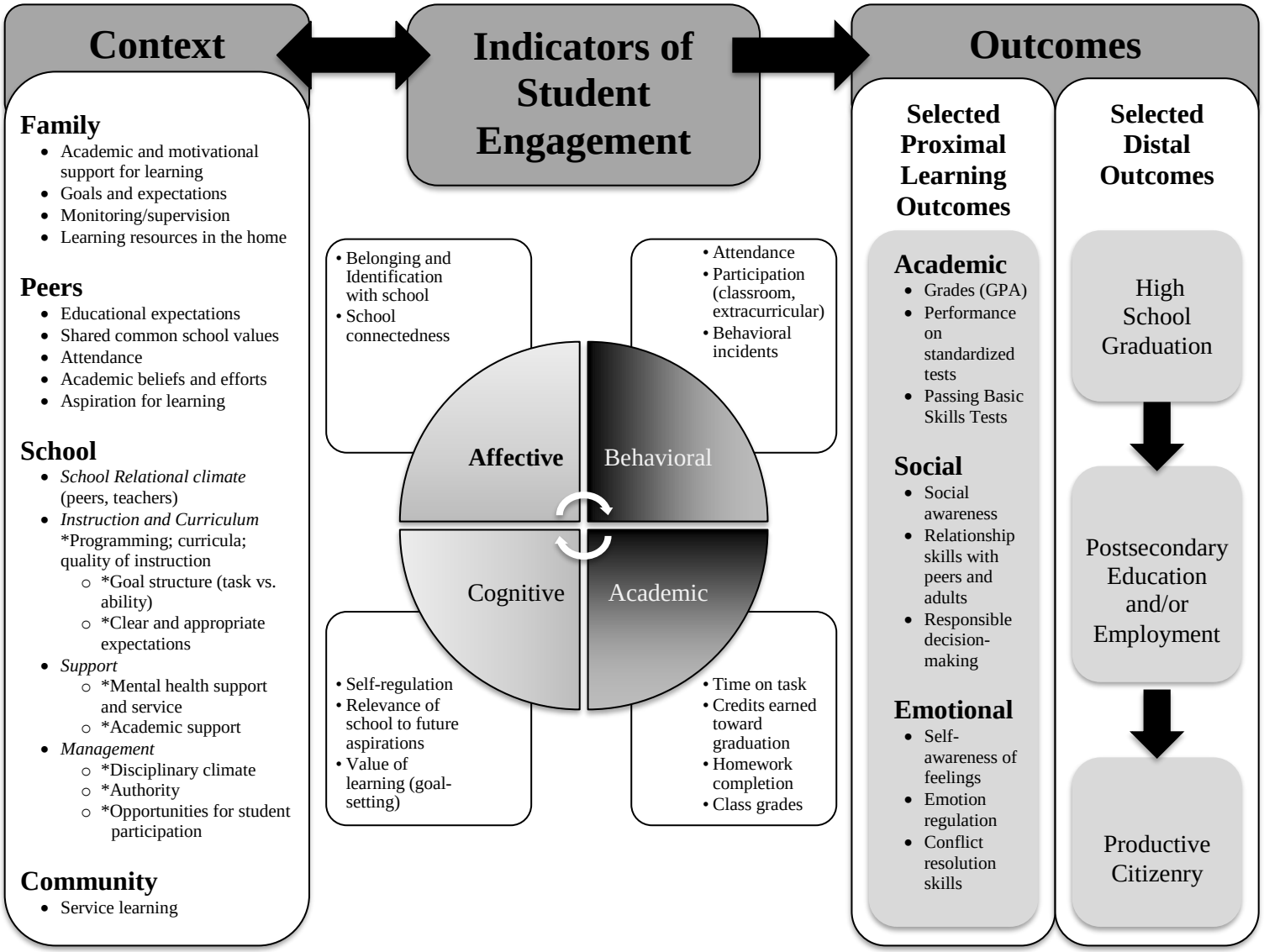
Lastly, in response to their work with an evidence-based dropout intervention, Check & Connect, Christenson and colleagues proposed four subtypes of engagement: academic, behavioral, cognitive, and affective (Reschly & Christenson, 2006a, 2012); bifurcating behavioral engagement into academic and behavioral subtypes with the goal of better linking

engagement data to intervention strategies. Within this model, academic (e.g., time on task, course credits earned) and behavioral variables (e.g., attendance, classroom participation) are distinguished as easily observable and frequently readily available indicators of engagement (Appleton et al., 2008). The other two subtypes, cognitive and affective engagement, represent internal indicators of engagement and are thus more difficult to measure. As depicted in Figure 2, it is proposed that cognitive and affective engagement may mediate academic and behavioral engagement such that students who are more engaged cognitively and affectively will then demonstrate greater academic and behavioral engagement (Appleton et al., 2008; Reschly & Christenson, 2006a, 2012).

In addition to the nature and number of engagement subtypes, researchers have long disagreed on how the relationship between engagement and motivation should be defined (Reschly & Christenson, 2012). Although some discuss engagement and motivation interchangeably (e.g., Martin, 2007; National Research Council, 2004), others distinguish them as separate constructs. For researchers falling into the latter realm, there is some consensus that engagement and motivation are related, but not interchangeable, because one may be motivated but not actively engaged in a task (Appleton, Christenson, Kim, & Reschly, 2006; Betts, 2012; Reschly & Christenson, 2012). In other words, motivation is necessary but not sufficient for subsequent engagement (Appleton et al., 2006; Reschly & Christenson, 2012; Martin, 2012). Still, others take a different approach by conceptualizing engagement as a metaconstruct that subsumes various lines of research, including motivation (Fredericks et al., 2004).

Among the subtypes of engagement proposed by various researchers, most confusion seems to surround internal indicators of engagement, specifically, the cognitive and affective subtypes (Reschly & Christenson, 2012). Further contributing to this confusion are conceptual

Figure 2.



Notes: Figure published in Reschly et al., 2017. Adapted from Appleton et al., 2006; Christenson et al., 2008 and Reschly & Christenson, 2012.

and theoretical differences in how the relationship between internal forms of engagement and motivation are defined. The overlap between internal forms of engagement and motivation is perhaps unsurprising given the similarity of the various psychological processes underlying engagement (Appleton et al., 2006; Betts, 2012). Motivation has been defined as the intensity, direction, quality, and persistence underlying other psychological processes that contribute to observable behavior or action (Maehr & Meyer, 1997), while engagement has been characterized as "motivation in action" (Reschly & Christenson, 2012). For those adhering to the idea of engagement as a metaconstruct (Fredericks et al., 2004), cognitive engagement and motivation are mostly similar, and perhaps the same subconstruct (Reschly & Christenson, 2012). Researchers who advocate that engagement and motivation represent separate constructs, however, posit that engagement is observable action while motivation is underlying intent (Appleton et al., 2008; Martin, 2012; Reeve, 2012; Reschly & Christenson, 2012). Despite these differences, researchers tend to agree that motivation and engagement are both malleable and important for academic achievement (Martin, 2012). Although the similarities among motivation and engagement create difficulties for theoretical differentiation, future research to uncover how internal forms of engagement are distinguished from motivation remains an important endeavor for the field of student engagement (Reschly & Christenson, 2012).

Overall, differences exist in how the multidimensionality inherent to the construct of student engagement is delineated and these differences stand in opposition to the advancement of student engagement research. Definitional variability, which highlights important conceptual and measurement issues, results in a lack of construct clarity and makes it difficult to compare findings across research studies (Appleton et al., 2006; Betts, 2012). Despite these issues, student engagement is a "burgeoning construct" (Reschly & Christenson, 2012, p. 17) and holds

promise as an effective indicator of success for all students, and as the cornerstone of school reform and dropout intervention efforts (Appleton et al., 2008; Christenson et al., 2008). Although many questions remain, researchers agree that engagement is multidimensional, malleable, important for learning, developmental in nature, and occurs over time (Appleton et al., 2008; Finn & Zimmer, 2012). Continued advancement of the student engagement construct, including disentangling conceptual and theoretical issues, relies predominately on accurate measurement of the construct so that research results can be interpreted meaningfully (Betts, 2012).

Measuring Student Engagement: Current Measures & Limitations

A proliferation of interest in student engagement over the past decade has resulted in multiple, and often inconsistent, definitions and descriptions of the construct. As of yet, conceptual clarity and methodological rigor have yet to be achieved, and both are important for advancing quality scholarship (Christenson et al., 2008). Although researchers tend to agree on the multidimensionality of engagement, studies reflect differences in how this is conceptualized and measured. For example, a recent review revealed current instruments used to measure student engagement differ based on the perspectives of the author(s) and/or the underlying theoretical framework (Fredericks et al., 2011). In this review, Fredericks and colleagues (2011) concluded that measures differ in the sources of data used (e.g., self-report, teacher report, observation), the number of engagement subtypes that are measured, and in the purpose and intended use of the instruments.

Although early studies primarily assessed behavioral indicators of engagement (e.g., time on task), more recent research reflects a general consensus that engagement is multidimensional and also focuses on aspects of the cognitive and affective subtypes (Appleton et al., 2006;

Fredericks et al., 2011). Typically, the aspect(s) of engagement an instrument intends to measure dictates the method in which information is collected, including the data source (Appleton et al., 2006; Fredericks & McColskey, 2012). Even when researchers agree on the engagement subtypes to be measured, the items and methodology used may vary. Similarly, even when the same methodology is used, variation in how engagement is defined and measured exists (Fredericks & McColskey, 2012).

Examination of overt subtypes of engagement (i.e., behavioral and academic), which are more readily observable than the other engagement subtypes, has been strongly emphasized in research (Appleton et al., 2008). Indicators of behavioral and academic engagement can be obtained fairly easily via data that is often tracked in standard record keeping, such as attendance and discipline records, homework completion, and number of accrued extra-curricular hours (Appleton et al., 2006; Fredericks & McColskey, 2012). Although recent conceptualizations of engagement include cognitive and affective subtypes, there is debate on how to best collect information on these aspects of engagement. Given that cognitive and affective indicators of engagement are represented internally, some have argued that observations by outside parties are not well-suited methods for collecting data (Appleton et al., 2006). Although more challenging to measure, cognitive and affective contributions to overall engagement should be included in student engagement measures. Systematic evaluation of cognitive and affective indicators of engagement allows for more precise measurement of the overall engagement construct and increases the likelihood of identifying students who may be in the process of disengaging from school (Appleton et al., 2006, 2008; Fredericks & McColskey, 2012).

Various methods for studying student engagement have been proposed, including self-report measures, experience sampling (ESM), teacher ratings of students, interviews, and

observations (Fredericks & McColskey, 2012). The internal nature of cognitive and affective engagement, which are theorized to mediate more overt indicators of engagement (e.g., academic and behavioral), makes collecting information on students' thoughts and feelings about their peers, teachers, and school more difficult (Reschly & Christenson, 2006a, 2012). Consequently, by utilizing student self-report measures, the critical perspective of the student is highlighted that may otherwise be missed or misinterpreted by other methodologies, such as observation or teacher report (Appleton et al., 2006). Currently, the vast majority of measures of student engagement are self-report surveys (Appleton et al., 2006; Fredericks et al., 2011). In addition to reducing inference, self-report measures are practical, relatively simple to administer, low-cost, and efficient (Appleton et al., 2006; Fredericks & McColskey, 2012). Limitations of self-report measures of engagement include inconsistent or inaccurate responding and the use of general statements (e.g., I work hard in school), which may not capture the importance of contextual influences on engagement (Fredericks & McColskey, 2012).

Of the 21 measures of engagement reviewed by Fredericks and colleagues (2011), 14 were self-report measures and five of these assessed three components of engagement (behavioral, emotional, and cognitive). Within the remaining self-report measures reviewed, five were based on two-component models of engagement (i.e., behavioral and emotional) and the other four examined engagement as one dimension (Fredericks et al., 2011). The self-reports reviewed ranged from short, four-item scales [i.e., Consortium on Chicago School Research/Academic Engagement Scale (CCSR/AES)] to lengthy, 121-item surveys [i.e., High School Survey of Student Engagement (HSSSE)]. Of the measures reviewed, most were created for use with students in middle and high school. Only two measures reviewed were intended for students in upper elementary school, and the youngest sample included third grade students

(Fredericks et al., 2011). To date, there are no published measures of student engagement in early elementary school.

Of particular interest to many student engagement researchers is increasing student engagement to promote school completion and positive outcomes across academic, behavioral, social, and emotional domains (Christenson et al., 2008; Reschly & Christenson, 2012). Two self-report measures developed in response to work on dropout prevention, the Identification with School Questionnaire (ISQ) and the Student Engagement Instrument (SEI), reflect an important connection between theory, measurement, and intervention (Fredericks & McColskey, 2012). If the goal of measuring student engagement is to identify students at-risk for poor outcomes and to intervene, utilizing a measure designed for this purpose is critical. Of all self-report measures reviewed, the SEI was specifically designed to examine cognitive and affective indicators of engagement that can be used in tandem with readily available behavioral and academic data to identify students that may benefit from engagement-based interventions (Appleton et al., 2006).

Developed by Appleton and colleagues (2006), the SEI assesses cognitive and affective engagement from the student's perspective (Appleton et al., 2006; Betts, Appleton, Reschly, Christenson, & Huebner, 2010; Lovelace et al., 2014). Regarding the theoretical framework of the measure, the SEI was designed in response to work conducted on dropout theory (e.g., Finn, 1989) and from the implementation and evaluation of an evidence-based dropout intervention, Check & Connect (see Christenson et al., 2008). The authors of the SEI espouse four subtypes of engagement: academic, behavioral, cognitive, and affective (Appleton et al., 2006; Reschly & Christenson, 2006a, 2012) and believe there are multiple indicators for each subtype (Appleton

et al., 2006). Furthermore, the SEI is grounded in theory that acknowledges the dynamic interplay among context, engagement, and outcomes of interest (Appleton et al., 2006, 2008).

The pilot study of the SEI was conducted on the responses of over 1900 ninth-grade students in a large, southeastern school district. Appleton et al. (2006) reported findings on the latent factor structure, internal consistency, and concurrent validity of the measure (Appleton et al., 2006). Exploratory and confirmatory factor analyses conducted on randomly selected separate halves of the population resulted in the selection of 35 items across 6 subscales. Three of the SEI factors were associated with the affective subtype of engagement: Teacher-Student Relationships (TSR), Family Support for Learning (FSL), and Peer Support for Learning (PSL). The remaining SEI factors of Future Goals and Aspirations (FGA), Control and Relevance of School Work (CRSW), and Extrinsic Motivation (EM), represent the cognitive subtype of engagement. Although the original study found a six-factor structure (Appleton et al., 2006), more recent work suggested a five-factor model represents the most parsimonious fit (Betts et al, 2010). The proposed five-factor model removes the Extrinsic Motivation subscale, which is composed of only two items; however, many schools and districts using the SEI prefer to keep the 6th factor, Extrinsic Motivation, in their data collection efforts. Importantly, the pilot study of the SEI revealed engagement correlated as expected with variables representing outcomes of interest, such as student achievement and behavioral infractions (Appleton et al., 2006).

Continued support for the construct validity of the SEI has been found in studies examining its factor structure and measurement invariance across different grade levels (Carter, Reschly, Lovelace, Appleton, & Thompson, 2012; Grier-Reed, Appleton, Rodriguez, Ganuza, & Reschly, 2012; Waldrop, Reschly, Fraysier, & Appleton, 2016). Additional support for the five-factor structure of the SEI was found in a study examining the engagement of students with high-

incidence disabilities, a population known to be at higher-risk for dropping out; further, extreme scores on the SEI predicted dropout and achievement on a high-stakes assessment for this population of students (Lovelace et al., 2014). A research study conducted in a rural district in the southeastern United States provided additional support for the factor structure of the SEI (Reschly, Betts, & Appleton, 2014) and evidence for convergent and divergent validity was found by comparing the measure to a similar measure of motivation and engagement, the Motivation and Engagement Scale (Martin, 2007). Betts et al. (2010) found structural invariance for grades 6-12, suggesting the measure is appropriate for multiple grade levels.

Researchers have created extensions of the SEI to be used with students in the upper-elementary grades (Carter et al., 2012) and with college-level students (Grier-Reed et al., 2012; Waldrop et al., in press). At the elementary level, a four-factor structure was found to best represent the engagement construct: FGA, PSL, TSR, and FSL (Carter et al., 2012). Research at the college level has revealed four- and five-factor models; therefore, additional research is needed at the college-level to determine the most appropriate factor structure (Grier-Reed et al., 2012). Continued research examining the continuity or discontinuity of the engagement construct across developmental periods is necessary to determine if qualitative changes in the engagement construct occur over time. If qualitative changes do exist, accurately measuring the engagement construct would require different measures across development. Overall, there are multiple studies providing emerging evidence of the utility of the SEI and SEI extensions for reliably assessing engagement across grade levels and with varying populations of students (Carter et al., 2012). Research is lacking, however, concerning the measurement of engagement with students in early elementary school (Fredericks & McColskey, 2012). The utility of

extensions of the SEI and SEI-E with young students is an important direction for research to evaluate the nature of engagement across development.

Measurement considerations, including the reliability and validity of self-report measures with young children, may explain the lack of student engagement research for this population. Although some researchers have evaluated the associations between teacher ratings of engagement with student ratings, correlations are low for indicators of emotional or affective engagement (Fredericks & McColskey, 2012). Therefore, the measurement of internal aspects of engagement requires self-report, even for very young students. A few widely-used and validated measures of internalizing symptoms, such as the Children's Depression Inventory, 2nd Edition (Kovacs, 2011) and the Revised Children's Manifest Anxiety Scale, 2nd Edition (Reynolds & Richmond, 2008), include self-report forms for children as young as 6 and 7 years of age.

Overall research on measurement issues with young children, particularly the use of self-report measures, is generally lacking with the exception of a few empirical studies. An early study of issues surrounding self-report found that young children demonstrate negative item bias (Marsh, 1986), or the tendency to rate themselves more negatively when items are worded in a negative fashion. Based on anecdotal reports of various researchers suggesting young children often endorse extreme-end response choices and show more difficulty with variation in response choices, Chambers and Johnston (2002) empirically studied the appropriateness of response choices on self-report measures designed to assess internal states of children. Results suggested a large effect size of the difference between response patterns of 5- and 6-year old children and 7- to 9-year olds, and between 7- to 9- year olds and 10- to 12- year olds (Chambers & Johnston, 2002). Specifically, 5- and 6- year old children endorsed significantly more extreme-end response choices, despite the number of response choices provided on the forms. Children age 7

and older, however, were better able to recognize variation in response choices and were less likely to consistently endorse extreme response choices (Chambers & Johnston, 2002). Together, these findings suggest nuances related to self-report measures for young children may serve as an impeding factor to the advancement of relevant research with this age group.

Although accurate measurement of student engagement, which is a prerequisite of applying effective interventions, progress monitoring, and school reform efforts, is one important direction for future research, the shortage of longitudinal studies assessing engagement also requires attention (Fredericks et al., 2004; Fredericks & McColskey, 2012; Reschly & Christenson, 2012). Early conceptualizations of engagement and current models emphasize the developmental nature of the construct (Finn, 1989; 1993; Christenson & Reschly, 2010). It is likely that engagement indicators vary across ages and may evolve and/or change over time (Fredericks & McColskey, 2012). Longitudinal data that examine how behavioral, cognitive, and affective engagement develop are needed to inform accurate measurement for students of different ages (Fredericks et al., 2004). Empirical studies on the developmental nature of engagement will provide important insight into how and when to intervene.

Early Indicators and Measures of Engagement

There is consensus that early indicators of withdrawal are evident in the elementary school years (Christenson & Thurlow, 2004) and that early school experiences impact children's futures, including the decision to dropout (Alexander, Entwisle, & Horsey, 1997). In other words, the decision to dropout is best conceptualized as a process that begins in early elementary school (Finn, 1989; Rumberger & Rotermund, 2012) and efforts have been taken to parse out how engagement is influenced by developmental patterns (see Mahatmya, Lohman, Matjasko, & Farb, 2012). A review of the few existing longitudinal studies identified behavioral engagement

as one of the strongest predictors of high school dropout, and evidence has been collected that indicators of behavioral engagement can be identified as early as first grade (Alexander et al., 1997; Rumberger & Lim, 2008). Research on the transition from pre-kindergarten to kindergarten, which is most children's introduction to formal schooling, has revealed strong correlations between early school experiences and later academic outcomes (Mirkhil, 2010; Pianta & Cox, 1999).

Empirical studies have also shown that children's social and emotional competencies, rather than academic abilities, are most important for early school success (Rimm-Kaufman, Pianta, & Cox, 2000; Stormont, Beckner, Mitchell, & Richter, 2005). Student engagement research posits that aspects of cognition and affect, or the way students think and feel, mediate behaviors that contribute to academic outcomes, including eventual school completion (Reschly & Christenson, 2012). Connecting research on early school experiences with student engagement research (which is largely drawn from dropout prevention theory and intervention) may further promote the utility of student engagement as a relevant construct for promoting student success (Alexander et al., 1997).

Consistent with research on student engagement, studies looking at early indicators of school withdrawal highlight the importance of contextual influences on student outcomes. Variables at the family, school, and individual levels are theorized to impact engagement (Reschly & Christenson, 2006a). The malleability of student engagement, an aspect of the construct that is appealing to educators, makes early identification and intervention imperative to promote successful outcomes for all students and, particularly, those at-risk for dropping out. Empirical research and evidence-based interventions have supported the use of student engagement as a cornerstone of the most promising dropout prevention and school reform

efforts; therefore, effective measurement of early engagement is needed to deliver appropriate and intensive intervention (Christenson et al., 2008; Finn & Zimmer, 2012; Reschly & Christenson, 2012).

A pilot study of the Student Engagement Instrument – Elementary Version (SEI-E) examined the psychometric properties of the measure designed for use with children in grades 3 through 5 (Carter et al., 2012). Created to extend knowledge of the student engagement construct across age groups, aid in longitudinal research, provide a means of early identification, and to contribute to a more comprehensive intervention framework, the SEI-E has promise as a tool for measuring early engagement. Validity evidence of the SEI-E extended the ages for which the SEI can be confidently used to include students in grades 3 through 12. The SEI-E correlated as expected with other indicators of engagement, such as attendance, discipline referrals, and socioeconomic status (Carter, 2013; Carter et al., 2012), contributing to evidence for concurrent validity of the factors underlying elementary engagement.

Differences from prior research conducted with the SEI, which identified five and six factor models (e.g., Appleton et al., 2006; Betts et al., 2010), were found in the SEI-E pilot and follow-up studies. Factor analytic procedures revealed a four-factor model best represents engagement in early elementary school, including TSR, PSL, FGA, and FSL. Results revealed items on the Control and Relevance of School Work (CRSW) scale behaved poorly for elementary-aged students, largely due to cross-loadings on factors pertaining to educational goals and teacher-student relationships (Carter et al., 2012). The authors of this study hypothesized that younger children may have more difficulty responding to items related to more abstract constructs, such as the relevance of schoolwork, while responding to items stated in concrete terms more easily. Continued research on indicators and measurement of cognitive and affective

engagement, which can be used alongside academic and behavioral data, is crucial for ensuring early and effective interventions and increasing knowledge regarding the development and continuity of the engagement construct across time.

Purpose of the Present Study

The purpose of the present study was to construct and examine the underlying psychometric properties of the SEI-E2, a downward extension of the elementary version of the Student Engagement Instrument (SEI-E). Modeled after the original Student Engagement Instrument (SEI), the SEI-E and SEI-E2 aspire to assess cognitive and affective engagement with school via individual self-report (Appleton et al., 2006; Carter et al., 2012). Research has shown scores on the SEI and SEI-E correlate as expected with other indicators of engagement such as attendance and test scores (Betts et al., 2010; Carter et al., 2012; Reschly et al., 2012). Research on engagement has also alluded to the developmental nature of the construct and the notion that engagement indicators vary across age and may change over time (Christenson & Reschly, 2010; Fredericks & McColskey, 2012). Importantly, indicators of each subtype of engagement emerge in the elementary school years (Christenson & Thurlow, 2004; Reschly & Christenson, 2012). In light of research highlighting the importance of early intervention to decrease dropout risk, the SEI-E2 was constructed to evaluate engagement during the formative years of schooling.

Numerous studies examining the psychometric properties of the SEI (e.g., Appleton et al., 2006; Betts et al., 2010, Lovelace et al., 2014) and its extensions (e.g., Carter et al., 2012; Grier-Reed et al., 2012; Waldrop et al., in press) have provided evidence towards the measure's reliability and validity (Betts, 2012). Despite these advances, one of the most pressing endeavors in the field of student engagement is continued research on accurate measurement of the engagement construct so that students at-risk for dropping out are identified and receive

intervention as early as possible (Christenson et al., 2008). While the SEI-E was designed for use with students in grades 3 through 5, the SEI-E2 was constructed for use with first and second grade students. Currently, few researchers have examined engagement with early elementary school students and there are no published measures of cognitive and affective engagement intended for use with this age group (Fredericks & McColskey, 2012). Although nuances of self-report with young children have been established (Chambers & Johnston, 2002), a few reliable and valid self-report measures of internalizing symptoms are available for this age group (e.g., Kovacs, 2012; Reynolds & Richmond, 2008). Examination of the underlying factor structure of engagement in early elementary school can lend valuable insight into the developmental nature of engagement and inform prevention and intervention efforts targeting vulnerable students (Betts et al., 2010). In order for this to be accomplished, accurate measurement of engagement must first be established (Betts, 2012; Samuelson, 2012).

Research conducted with the SEI-E resulted in disparate findings from SEI studies; specifically, a four-factor structure that removed the Control and Relevance of School Work (CRSW) scale represented the best fit (Carter et al., 2012). The authors of this study hypothesized that young children have more difficulty understanding abstract concepts and can more accurately respond to items stated in concrete terms (Carter et al., 2012). Research on measurement issues with young children discourages the use of reverse items and suggests 5- and 6- year old children have more difficulty understanding variation in response choices than children 7 and older (Marsh, 1986; Chambers & Johnston, 2002). In response to these findings, the wording of individual items on the SEI-E2 were reduced to simpler, more concrete statements (see Table 1). To explore the functionality of multiple response choices, two versions of the SEI-E2 were piloted with second graders, a 3-point and a 5-point scale. Students in first

grade received the 3-point scale form only due to research suggesting children this age have difficulty understanding multiple response choices, and tend to endorse extreme-end choices despite the number of available choices in the response array (Marsh, 1986; Chambers & Johnston, 2002). Given the exploratory nature of the current study, utilizing two forms allows for examination of the ability of second graders to understand variation in response options. Lastly, on both versions of the SEI-E2, pictures of corresponding facial expressions were provided above item choices to make differences in response options more clear.

Reliable measurement of the engagement construct in early childhood is a crucial step towards prevention and intervention efforts targeting students at-risk for negative school outcomes. The SEI-E2 was developed to address this need. Extensive examination of the measure's validity and underlying psychometric properties are necessary steps in the process of establishing the SEI-E2 as a reliable measure of cognitive and affective engagement for first and second grade students. Although the SEI and SEI-E measure the engagement of students in grades 3 through 12 (Appleton et al., 2006; Betts et al., 2010; Carter et al., 2012; Lovelace et al., 2014), presently, there are no measures of engagement for early elementary school students (Fredericks & McColskey, 2012). Early measures of engagement are needed to identify students that may be just beginning the disengagement process (Finn, 1989, 1993). In light of these issues, the current study aimed to address the following research questions:

(1) What is the validity evidence of the SEI-E2 as a measure of cognitive and affective engagement for first grade students? Is the intended four-factor structure replicated with this sample?

(2) How well do the 3-point and 5-point Likert-type scales of the SEI-E2 compare for second grade students? Is the intended four-factor structure replicated with these samples?

(3) What are the relationships between factor scores on the SEI-E2 and other variables of interest (e.g., attendance, achievement scores, and special education status)?

CHAPTER 3

METHODS

Participants

Participants were first and second grade students from Gwinnett County Public Schools (GCPS). GCPS is one of the largest urban school districts in the United States and serves a diverse population of students. During the 2014-2015 academic year, GCPS served more than 188,000 students in 136 schools. Of these students, 56% qualified for free or reduced-price meals, over 11% qualified as having a disability, and 17% were limited English proficient. Demographically, GCPS serves a population of students that is 31% Black, 28% Hispanic, 27% White, 10% Asian, and 4% Multiracial. In 2015, GCPS obtained a 78% graduation rate, which was a 3% improvement from the 2013-2014 academic year. Females had a higher graduation rate than Males, and economically disadvantaged, limited English proficient, and students with disabilities were less likely to graduate than their peers (Georgia Department of Education, 2015).

The current study included five elementary schools. A total of 1,526 first and second grade students completed SEI-E2 forms. Following data cleaning, complete SEI-E2 data for 1,416 students were obtained. Demographics of the sample in the current study are similar to GCPS demographics and gender was represented equivalently (males= 51%). Table 1 represents the demographic characteristics of the whole sample and each individual sample that completed the three forms of the SEI-E2. Demographics were mostly consistent across each sample but there were significantly more students in first grade with an ELL indicator. This finding is

expected given that more students receive ELL services in the early grades and the number of students receiving ELL services steadily declines after first grade (Snyder & Dillow, 2015).

Table 1.
Description of Participants: Sample Sizes and Percentages

Demographic Variables	Sample Size/ Percentage			
	Whole sample	1st grade sample/3-point	2nd grade sample/3-point	2nd grade sample/5-point
Sample Size	1,416	689/ 48.5	391/ 27.6	336/ 23.7
Male	720/ 50.8	348/ 50.1	197/ 50.4	175/ 52.1
Female	696/ 49.2	341/ 49.5	194/ 49.6	161/ 47.9
Race:				
White	482/ 34.0	248/ 36.0	121/ 31.0	113/ 33.6
Hispanic	370/ 26.1	180/ 26.1	114/ 29.2	76 /22.6
Black	351/ 24.8	148/ 21.5	102/ 26.1	101/ 30.1
Asian/Pacific Islander	143/ 10.1	71/ 10.3	44/ 11.3	28/ 8.3
Multiracial	69/ 4.9	41/ 6.0	10/ 2.6	18/ 5.4
Indian	1/ <.01	1/ 0.2	0/ 0.0	0/ 0.0
Primary Language:				
English	1293/ 91.3	595/ 86.4	369/ 94.4	329/ 97.9
Other (ELL indicator)	123/ 8.9	94/ 13.6	22/ 0.6	7/ <.01
Special Education Eligible	122/ 8.6	57/ 8.3	44/ 11.3	21/ 6.3
FRL Status Eligible	710/50.1	326/ 47.3	207/ 52.9	177/ 52.7

Measures

Student Engagement Instrument – Second Elementary Version (SEI-E2). Student engagement has emerged as the cornerstone of dropout intervention and prevention efforts due to its focus on alterable variables that are amenable to intervention (Christenson et al., 2008; Reschly & Christenson, 2012). Identification procedures that include functional risk factors, defined as variables that differentiate risk of drop out among high-risk demographic groups, are

more effective in identifying students most at-risk for dropping out (Christenson, 2008; Reschly & Christenson, 2012). The current study serves as a pilot study of the Student Engagement Instrument – Elementary Version, 2nd Edition (SEI-E2), which was created to measure the cognitive and affective engagement of first and second grade students. The SEI-E2 is a downward extension of the original Student Engagement Instrument (SEI) created by Appleton and colleagues (Appleton et al., 2006). Prior to the current study, the SEI-E (Student Engagement Instrument – Elementary Version) was designed for use with students in grades three through five (Carter et al., 2012). By adapting the SEI-E for first and second grade students, the current study aims to examine the utility of the SEI-E2 as a measure of engagement in early childhood and to uncover information about the engagement construct for younger students.

The theoretical underpinnings of the SEI are based upon Christenson and colleagues work with an evidence-based dropout intervention, Check & Connect (Reschly & Christenson, 2012). Based on their research, a four-part typology of engagement was proposed that includes academic, behavioral, cognitive, and affective subtypes (Appleton et al., 2006; Christenson et al., 2008; Reschly & Christenson, 2006a, 2012). Although academic and behavioral engagement data are readily available, assessment of cognitive and affective engagement requires self-report (Appleton et al., 2006). Therefore, the SEI was created to assess the cognitive and affective engagement of middle and high school students.

The psychometric properties of the SEI have been examined in several studies (e.g., Appleton et al., 2006; Betts et al., 2010; Lovelace et al., 2014; Reschly et al., 2012). Appleton and colleagues' (2006) pilot study of the SEI was conducted with 9th grade students and examined its underlying factor structure using exploratory and confirmatory factor analysis.

Initial analyses resulted in six factors or subscales: three assessing cognitive engagement [Control and Relevance of School Work (CRSW), Future Aspirations and Goals (FG), and Extrinsic Motivation (EM)] and three measuring affective engagement [Teacher-Student Relationships (TSR), Family Support for Learning (FSL), and Peer Support for Learning (PSL)] (Appleton et al., 2006). More recently, Betts et al. (2010) espoused a five-factor model that removed the Extrinsic Motivation subscale. In line with the findings of Betts et al. (2010), the final version of the SEI is comprised of 33 items on five subscales. In some cases, however, the Extrinsic Motivation scale is retained during data collection for informational purposes.

Created as a measure of engagement in elementary school, the SEI-E was designed to maintain congruence with the original SEI (Carter et al., 2012). Initial analyses of the SEI-E supported a factor structure similar to the SEI by revealing a five- factor model (Carter et al., 2012). Subsequent analyses, however, indicated the CRSW factor did not function well for this group of students (i.e., items cross-loaded across factors), resulting in a four-factor model (Carter, 2013). Authors of this study hypothesized that younger children may struggle to understand abstract concepts (e.g., relevance of school work) and respond more easily to concrete items. Divergent findings on the latent factor structure of the SEI-E from the SEI may suggest qualitative changes in the engagement construct across developmental periods (Carter et al., 2013). Identical to the SEI, the SEI-E contains 19 items to assess cognitive engagement and 14 items to assess affective engagement. Although item content is similar across these measures, items on the SEI-E were reconstructed to reflect developmentally appropriate wording for third through fifth grade students (Carter et al., 2012). In addition to construct validity, research conducted with the SEI and SEI-E has shown the factors each correlate as expected with other

indicators of engagement (e.g., academic achievement and behavioral infractions), providing evidence for external validity (Appleton et al., 2006; Carter et al., 2012).

Although the SEI-E examines engagement for students in the upper elementary grades, the SEI-E2 was created to measure engagement in early elementary school. Based on the finding that the CRSW items did not function well for upper elementary school students (Carter et al., 2012), this scale was removed from the SEI-E2. Consistent with research on the SEI-E, the EM scale was also removed resulting in a 24-item survey. The current author consulted with a panel composed of multiple engagement scholars, the Director of Advisement and Counseling in GCPS, and several GCPS counselors and teachers to review the SEI-E2 items and to create developmentally appropriate scales for first and second grade students. Teachers on the panel raised concern for first graders' ability to fully comprehend and respond appropriately to widely variable response options (e.g., a 5-point scale). A resulting 3-point Likert-type scale was designed (1 = no, 2 = maybe, 3 = yes) including corresponding facial expression pictures above the response options.

Given the exploratory nature of the study, the panel decided to pilot two forms with second grade students: a 3-point scale form, identical to that used with first graders, and a 5-point scale form (1=strongly disagree, 2=disagree, 3=in the middle, 4=agree, 5=strongly agree); corresponding facial expressions were included on each form. The panel suggested that second grade students are more likely to understand the subtleties underlying response option variability (e.g., the difference between strongly agree and agree) than first grade students. Therefore, the current study examined the functionality of the 3-point and 5-point scale forms with second grade students to determine which form represents the best measure of engagement for this grade level. The final versions of both versions of the SEI-E2 exclude the CRSW and Extrinsic

Motivation scales, resulting in a 24-item survey that is consistent with the original SEI and SEI-E.

Academic and Behavioral Engagement Indicators. The theoretical underpinnings of the SEI and its extensions posit that affective and cognitive engagement are less observable than the academic and behavioral subtypes of engagement and require individual self-report (Appleton et al., 2008; Reschly & Christenson 2006a, 2012). Alternatively, academic and behavioral engagement data, including school attendance and academic achievement scores, are readily available. The relationships among these variables of interest and SEI-E2 scores were evaluated through correlation analyses. Specifically, performance on the reading and math portions of the Iowa Test of Basic Skills (ITBS), a nationally standardized achievement measure, served as indicators of academic engagement for second grade students. For first graders, district-wide achievement test scores were unavailable. Attendance data, an indicator of academic engagement, were evaluated in comparison to reported levels of engagement for both first and second grade students. To minimize missing data, behavior referral information was excluded from the final dataset due to the low frequency of discipline records for early elementary school students (Carter, 2013).

Demographic Variables. Student engagement research has shown that certain demographic groups are more likely to drop out of school, including students with disabilities and those from ethnic minorities (Alliance for Excellent Education (AEE), 2011; Ingels & Dalton, 2013). Therefore, the current study examined SEI-E2 score trends for demographic groups identified as at-risk for dropping out: students with high-incidence disabilities (i.e., specific learning disability, emotional and behavioral disorder, speech-language impairment;

Reschly & Christenson, 2006b) and those from low-income backgrounds (determined by eligibility for free or reduced-price lunch [FRL]).

Procedures

SEI-E2 surveys were distributed to students in GCPS in the Fall of 2015. The SEI-E2 was administered to whole classes to minimize targeting specific students or demographic groups. A total of 687 first graders and 727 second graders completed SEI-E2 forms; of the 727 second graders, 391 completed the 3-point scale version and 336 completed the 5-point scale version. In GCPS, the original SEI is administered twice yearly to students in grades six through twelve. Standard administration protocol of the SEI was closely followed during administration of each form of the SEI-E2. To control for potential reading difficulties, teachers read the surveys aloud while students independently provided responses on the forms.

Analytic Method

Data Screening. Following administration of the SEI-E2, the current author transcribed student response data into an Excel file. Approximately ten percent of the total forms collected were randomly selected to verify accurate transcription (n=155); no errors were found. Student demographic data (e.g., gender and ethnicity) were then extracted from district data files and added to the dataset by a district representative. The dataset was de-identified and provided to the current author by the GCPS Research and Evaluation office. Prior to conducting analyses, the dataset was examined for any students listed in a grade other than first or second grade. Errors in students' transcription of their student identification number on the SEI-E2 forms resulted in inaccurate district data to be extracted for these students; therefore, these cases were removed (n=108). Cases with missing values greater than 25% (n=2) were also excluded from the final file resulting in a final sample size of 1,416. Given the large sample size, the number of

cases removed due to missing data was deemed insignificant. Examination of missing data did not suggest systematic patterns underlying the missing responses.

Research Questions One and Two: Factorial Structure of the SEI-E2. Following scale development procedures, the purpose of the current study is to examine the reliability and validity evidence of the SEI-E2. The first two research questions examine the internal validity of the SEI-E2: the 3-point scale version with first graders and a comparison of the 3-point and 5-point scale versions for second graders. In attempt to collect preliminary evidence of construct validity, thorough examinations of the latent factor structure of the SEI-E2 for three samples were conducted by exploring how well the intended four-factor model was replicated for each sample. The following factor structure of the SEI-E (Carter et al., 2012) was used for comparison: Factor 1 (TSR) items 1, 4, 8, 10, 12, 14, 18, 21, 23; Factor 2 (PSL) items 2, 7, 9, 11, 13, 15; Factor 3 (FGA) items 3, 6, 17, 19, 22; and Factor 4 (FSL) items 5, 16, 20, and 24. Exploring the congruence of the factor structure of the SEI-E2 with the intended four-factor model of the SEI-E may provide important information pertaining to the nature and measurement of student engagement in early elementary school.

Following similar methodology of previous SEI and SEI-E validation studies (see Appleton et al., 2006, Betts et al., 2010, Carter et al., 2012, Lovelace et al., 2014), Exploratory and Confirmatory Factor Analysis (EFA/CFA) procedures were conducted to examine model fit. Given the current goal of evaluating congruence of the SEI-E four-factor model with the factor structure of the SEI-E2, EFA procedures were primarily conducted to examine if a four-factor model was suggested for each sample and how items behaved under these conditions. Discrepant from procedures followed in SEI and SEI-E validation studies, split-half procedures were not conducted during factor analyses. Although split-half procedures are important for

cross-validating models suggested through EFA in CFA, the procedures are less important when analyzing theoretically informed, previously validated models with new data. Therefore, the results of CFA are most vital for answering the research questions posed in the current study, but EFA results may provide important theoretical information. In addition to these reasons, using split-half procedures was rejected due to the smaller sample sizes in the current study compared to those in prior SEI and SEI-E validation studies. Prior to conducting EFA, a polychoric correlation matrix was constructed for each sample separately and then examined for low (.30) and high (.80) correlations. When relationships between variables are weak, it is unlikely the variables will load on an underlying factor; conversely, very strong relationships indicate that multiple variables may be unnecessary. Therefore, low and high relationships were examined prior to conducting factor analysis and revealed that several correlations were low (<.10). Given the purpose of the current study, no items were deleted as a result.

The current study first sought to examine the factor structure of the SEI-E2 for first and second grade students by exploring latent factors through EFA. Software and estimation procedures in the current study are consistent with prior SEI and SEI-E validation studies (e.g., Appleton et al., 2006; Betts et al., 2010; Carter et al., 2012). In addition to being selected to maintain congruence with previous studies, Mplus version 7.0 (Muthén & Muthén 1998-2012) was utilized because it provides the robust weighted least squares (WLSMV) estimator that is suitable for categorical data (Brown, 2006). Form versions of the SEI-E2 included 3- and 5-Likert-type response option categories that are ordinal in nature; therefore, the WLSMV estimator was deemed an appropriate estimator for the current study. Mplus, and the WLSMV estimator specifically, incorporate a method for handling missing data analogous to pairwise deletion and thus maximizes the number of cases retained for analyses (Asparouhov & Muthén,

2010; Muthén & Muthén, 1998-2012). Principal axis factoring, which assumes unique and shared variance among variables, was used as the factor analysis procedure (Brown, 2006). To aid in simplifying the interpretation of factor loadings, an oblique rotation (Promax) was selected. This rotation method was chosen based on the assumption that latent factors represent subtypes of the overall student engagement construct and are by nature correlated.

Models suggested for each sample through EFA were examined according to factor interpretability and model fit indices (Brown, 2006; Carter et al., 2012). Of particular interest to the current study was if the intended four-factor model of the SEI-E was replicated for each sample. Available model fit indices for EFA [(e.g., Chi-square, root mean square error of approximation (RMSEA)], were used to interpret the fit of each suggested model. Scree plots and Kaiser's eigenvalue-greater-than-one criterion (Kaiser, 1960) were also considered. In previous SEI and SEI-E studies, the total percentage explained by each model and the variance explained by each factor were reported (Appleton et al., 2006; Carter et al., 2012; Carter, 2013). The intent of the Promax rotation method utilized in Mplus (Muthén & Muthén, 1998-2012) is to reproduce the correlation matrix, not maximize variance; therefore, eigenvalues are not clearly related to variance and percentage of variance explained by factors and overall models cannot be reported (Muthén & Muthén, 1998-2012).

After exploring loading patterns through EFA, CFA procedures were conducted to validate the four-factor model. Following the recommendations of Brown (2006) and Kline (2010), multiple model fit indices and statistical criteria, including Chi-square, RMSEA (≤ 0.5), comparative fit index (CFI; ≥ 0.95), and the Tucker-Lewis Index (TLI; ≥ 0.95), were calculated. As noted in prior SEI and SEI-E studies, Chi-square is sensitive to sample size and should not be the primary index of model fit; therefore, it is reported alongside other indicators of model fit

(Appleton et al., 2006, Betts et al., 2010, Carter et al., 2012, Lovelace et al., 2014). RMSEA, CFI, and TLI values range from 0.0 to 1.0. RMSEA values closer to zero and CFI and TLI values closer to 1.0 are indicative of good model fit (Browne & Cudeck, 1993; Hu & Bentler, 1999). Following EFA/CFA, estimates of internal consistency (e.g., coefficient alpha analyses) were conducted to examine the internal reliability of the SEI-E2.

Research Question Three: External Validity. Following similar logic of SEI and SEI-E studies, relationships between self-reported levels of engagement and variables of interest were thoroughly examined through correlation analyses (Appleton et al., 2008; Betts et al., 2010; Carter et al., 2012). Due to the non-normal distribution of categorical data, nonparametric correlations (e.g., Spearman's Rho) were used. This methodology is consistent with procedures followed in SEI-E studies (Carter et al., 2012; Carter, 2013). Specifically, relationships between self-reported levels of engagement and other indicators of engagement (e.g., attendance and achievement scores) and demographic factors (e.g., free and reduced lunch status, special education status) were evaluated for external validity purposes. In the pilot study of the SEI-E, Carter and colleagues (2012) found that the inclusion of discipline referral data for upper elementary school students resulted in skewed data due to the low frequency of occurrences for that population. Given the anticipated low frequency of discipline referrals on record for early elementary school students, these data were not included as an indicator of behavioral engagement for the current study. Total SEI-E2 scores were expected to positively correlate with higher levels of academic achievement and negatively correlate with increased absences and lower rates of attendance. Demographically, SEI-E2 scores were expected to be lower among demographic groups designated as high-risk (i.e., students from low-income backgrounds and students with disabilities).

CHAPTER 4

RESULTS

Preliminary Analyses

Prior to conducting main analyses, descriptive statistics (including frequencies, means, standard deviations, skewness, and kurtosis) were calculated and analyzed for individual items in each sample. According to Kline (2005), items with skewness values ±3.0 and kurtosis values ±8.0 violate the assumption of normality. Importantly, ordered, categorical data (e.g., responses to Likert-type items), are non-normally distributed and violation of the assumption of a normal distribution is a non-issue (Finney & DiStefano, 2006). Factor analytic research conducted with non-normal, categorical data should rely on estimation methods designed for this purpose. The weighted least squares (WLSMV) estimator used in Mplus (Muthén & Muthén 1998-2012) is designed for use with categorical data and adjusts parameter estimates and fit statistics accordingly (Brown, 2006; Finney & DiStefano, 2006).

Analysis of item statistics for informational purposes revealed all items were negatively skewed across samples. Consistent with findings in SEI-E studies, this suggests most students in first and second grade reported moderate to high levels of engagement (Carter et al., 2012; Carter, 2013). Within each sample, several items exhibited kurtosis values greater than 8.0 and suggests frequent endorsement of response choices on the extreme end for these items (e.g., "yes" on the 3-point scale and "strongly agree" on the 5-point scale). Interestingly, more items with extreme kurtosis values were present in the second grade sample that completed the 3-point scale version. This may indicate that the presence of additional response option categories,

which allows for more variation in responding, also allows for greater specificity and decreases extreme responses. Similar to this finding, examination of individual item standard deviations and averages across samples revealed greater variation on average in responses on the 5-point scale (.91) than on the 3-point scale completed by second graders (.53) and first graders (.56) using the 3-point scale. Item standard deviations below 1.0 represent restriction in the range of responses for that item (Bandalos, 2011). Together, these findings provide evidence that in the current study, first and second grade students reported mid to high levels of engagement and demonstrated greater response variation when more response option categories were available.

Research Questions One and Two

A primary goal of the current study was to examine the validity of the SEI-E2 by conducting a thorough exploration of the latent factor structure of two versions of the measure: a 3-point scale and a 5-point scale. Two samples (first and second grade) received the 3-point scale version and one sample (second grade) received the 5-point scale version. A comparison of the latent factor structure of both versions used with second graders was also of primary interest to the current study. Following scale validation procedures of SEI-E2 predecessors, exploratory factor analyses were conducted to examine loading patterns in suggested models. According to Kaiser's eigenvalue greater-than-one criteria (Kaiser, 1960) and individual scree plots (Figures 3-6), retaining between one and six factors were suggested for the first grade sample and the second grade sample that completed the 5-point scale. Retaining between one and seven factors was suggested based on responses of the second grade sample that completed the 3-point scale.

Figure 3.
Exploratory Analysis Scree Plot: First Grade, 3-Point Scale

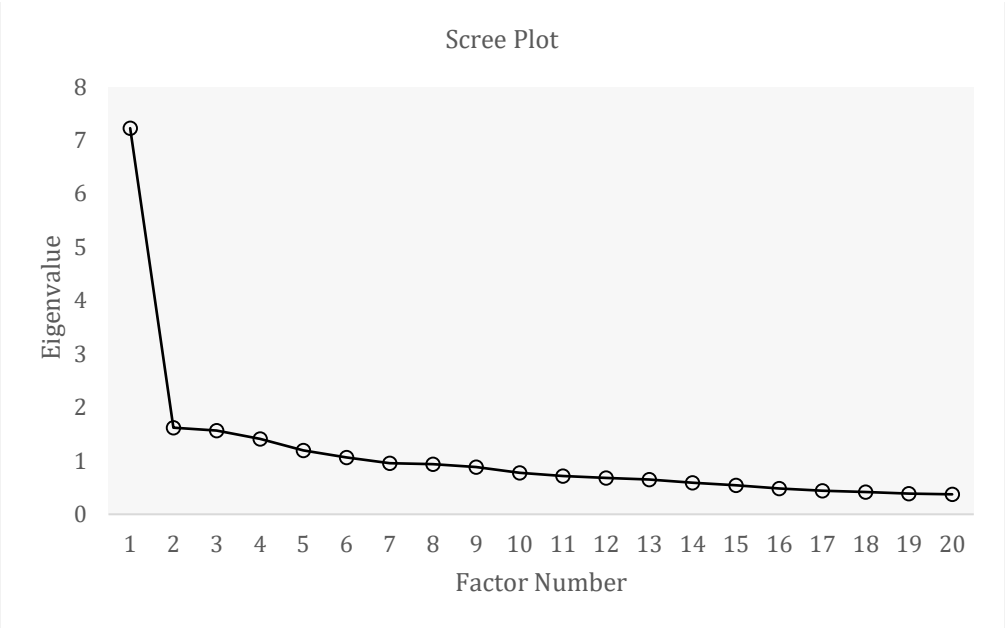


Figure 4.
Exploratory Analysis Scree Plot: Second Grade, 3-Point Scale

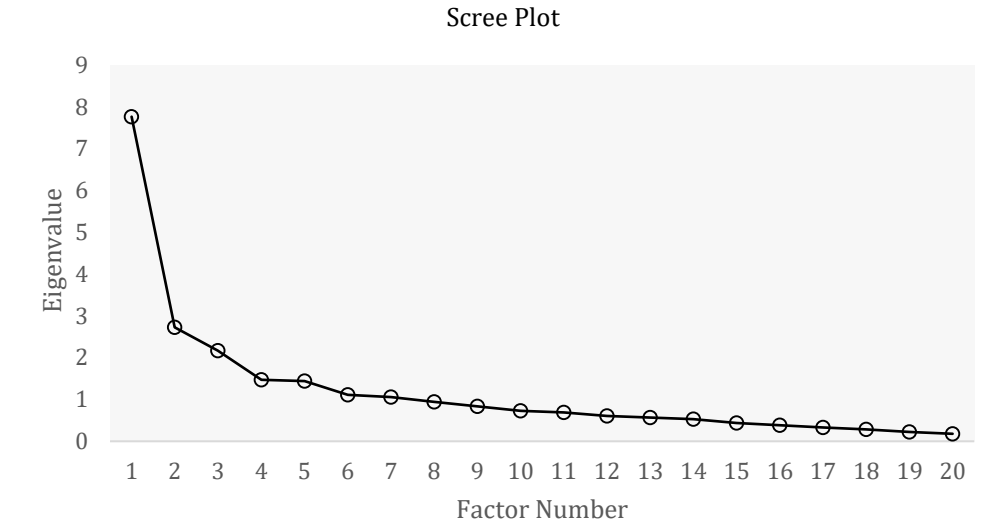
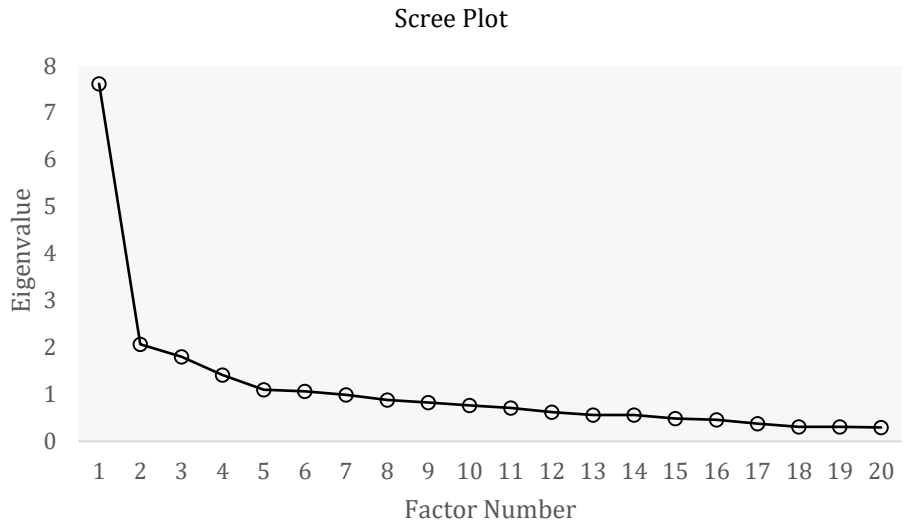


Figure 5.
Exploratory Analysis Scree Plot: Second Grade, 5-Point Scale



Following the recommendation of Brown (2006), model interpretability informed by underlying theory and statistical indicators of fit were used for evaluating models in EFA. Following oblique rotations, model fit statistics [e.g., Chi-square, root mean square error of approximation (RMSEA)] and factor loadings were analyzed. Factor interpretation was most clear when a four-factor model was selected for each sample. Designed to maintain congruence with the SEI-E (Carter et al., 2012), items on the SEI-E2 are intended to represent four subtypes of student engagement: Teacher-Student Relationships (TSR), Family Support for Learning (FSL), Peer Support for Learning (PSL), and Future Goals and Aspirations (FGA). Model fit indices suggested good-fit of a four-factor solution for each sample and are reported in Table 2 Across suggested models, several items behaved poorly by cross-loading on two factors. Given the importance of interpretability for measures based on underlying theory, thorough examination of potential areas of localized strain in the four-factor models were examined.

Table 2.
SEI- E2 Four-Factor EFA Model Fit Indices

Grade/Version	$\chi 2$	*df*	RMSEA
1st Grade/ 3- point	239.252*	186	0.017
2nd Grade/ 3- point	235.356**	167	0.032
2nd Grade/ 5- point	263.658**	186	0.035
Goodness of Fit Guidelines			<.05[a]

Note. RMSEA = root mean square error of approximation. [a]Browne & Cudeck, 1993. *p<.005, **p<.001.

For each four-factor model, several items loaded on multiple factors and the items that cross-loaded varied across samples. Three items in the first grade sample, items 2, 6, and 24, demonstrated loadings on their anticipated factors and also on a second factor. In each case, factor loadings were greater on the factor the item was designed to measure than on the second factor. The same was true for two items that cross-loaded in the second grade sample that completed the 3-point scale version of the SEI-E2 (items 4 and 21). For the second grade sample that completed the 5-point scale version, items 12, 23, and 24 loaded on two factors. The factor loadings for items 12 and 23 were greater on the anticipated factors than on the second factor. Item 24 ("My family wants me to keep trying when things at school are hard"), however, evidenced a slightly stronger loading on the second factor (FGA, .363) than the intended factor (FSL, .316). Item 24 also proved problematic in the other second grade sample by exhibiting negative residual variance. Lastly, item 19 ("I am hopeful about my future") did not load on a factor in the first grade sample. For first grade students, the content of item 19 may be too abstract. Standardized parameter estimates and factor loadings for each four-factor model are presented in Tables 3-5.

Examination of initial factor loadings revealed interesting patterns. For the first grade sample, a PSL item (Item 20, "Students at my school are there for me when I need them") loaded on both PSL and FSL. Item 6 ("My education will give me many chances to reach my future goals") loaded as expected on FGA and negatively with TSR. The direction of this finding is unexpected since reported levels of TSR (subtype of affective engagement) positively correlated with FGA (subtype of cognitive engagement) in SEI and SEI-E studies (Appleton et al., 2008; Carter et al., 2012). This finding may suggest that, for very young children, future- and goal-orientation may not be as dependent on TSR, or could reflect issues with item wording. In the pilot study of the SEI-E, reported levels of FGA were closely related to reported levels of FSL. The authors of this study speculated that children's future- and goal- orientations are reflective of their parent's goals for them (Carter et al., 2012). In other words, it is possible that family, teacher, and peer influences on affective engagement and the relationship between affective and cognitive engagement changes over the course of development. It is also possible that affective and cognitive engagement develop on different trajectories. The relationship among factors was explored in greater detail following CFA. Item 24 ("My family wants me to keep trying when things at school are hard") loaded as expected on FSL but also on FGA. Item 2, "Students at my school are there for me when I need them," loaded on both PSL and FSL providing further evidence of overlap among subtypes of engagement for first grade students.

Table 3.
Standardized Parameter Estimates in the Four-Factor 3-Point, SEI-E2 Model with First Grade Students: Rotated Factor Loadings

Items	*TSR*	*PSL*	*FGA*	*FSL*
4. My teachers care about students.	**.78**			
1. My teachers are fair to students.	**.68**			
23. My teachers care about me.	**.66**			
14. I like talking to my teachers.	**.55**			
12. My teachers are there for me when I need them.	**.42**			

8. My teachers are honest with me.	**.39**			
10. My teachers listen to students.	**.38**			
18. The rules at my school are fair.	**.37**			
21. I feel safe at school.	**.32**			
9. Students at my school care about me.		**.72**		
15. I have some friends at school.		**.68**		
11. Other students like me the way I am.		**.53**		
7. Other students respect what I have to say.		**.47**		
2. Students at my school are there for me when I need them.		**.40**		*.33*
13. I enjoy talking to students at my school.		**.38**		
22. School is important for reaching my future goals.			**.62**	
3. I plan to go to college after high school.			**.53**	
6. My education will give me many chances to reach my future goals.	*-.32*		**.52**	
17. It is important to keep learning after high school.			**.51**	
19. I am hopeful about my future.*				
20. My family is there for me when I need them.				**.59**
5. My family helps me when I have problems at school.				**.57**
24. My family wants me to keep trying when things at school are hard.	*.36*			**.42**
16. My family wants to know when something good happens at school.				**.32**

**Bolded values = item loaded on intended factor. Italicized values = cross-loadings. *Item did not load on a factor.*

Although items within each of the four-factor models demonstrated cross-loadings, overall issues were significantly more pronounced with the second grade sample that completed the 3-point scale version of the SEI-E2. Items 4 ("My teachers care about students") and 21 ("I feel safe at school"), both intended to tap TSR, cross-loaded on FSL and PSL, respectively. As mentioned previously, item 24 loaded as expected on FSL but the loading (> |1.0|) indicated negative residual variance that may represent issues with the overall model. Solutions containing negative residual variance are often deemed inadmissible and indicators with negative residual variance are often referred to as Heywood Cases (Jöreskog, 1999; Kline, 2005). Potential reasons for Heywood Cases include too many or too few common factors, misspecification of the model, and/or too few data to provide stable estimates (Jöreskog, 1999). In addition to the

aforementioned concerns, the 4th factor (FSL) contained only one indicator and is, therefore, undetermined. In order for a factor to be well-defined, three or more indicators are generally suggested (Brown, 2006).

Initial factor loadings and patterns for this sample revealed many items did not load on factors as expected and there was significant overlap among factors. Overall, the TSR and PSL factors functioned better than FGA and FSL. All items intended to measure TSR loaded as expected. In addition, three FGA items also loaded on TSR resulting in an unclear factor structure. Items loaded as expected on PSL. The FGA and FSL factors did not function well with this sample. As stated previously, three FGA items loaded on TSR and three FSL items loaded on FGA. Only two of the intended five FGA items loaded on the FGA factor and only one item loaded as expected on the FSL factor. For this sample, significant overlap in factor loadings resulted in poorly defined factors that are difficult to interpret. These issues may be evidenced by the presence of negative residual variance. In addition to these issues, item statistics calculated prior to EFA suggested fewer response options on the 3-point scale version resulted in limited variation in responses as compared to responses on the 5-point version of the SEI-E2. Together, these concerns provide tentative evidence that the four-factor model was not replicated for this sample and that the 3-point scale version of the SEI-E2 with second grade students demonstrates poor construct. As a result, data from this sample were excluded from subsequent analyses.

Table 4.
Standardized Parameter Estimates in the Four-Factor 3-Point, SEI-E2 Model with Second Grade Students: Rotated Factor Loadings

Items	*TSR*	*PSL*	*FGA*	*FSL*
4. My teachers care about students.	**.92**			*.86*
12. My teachers are there for me when I need them.	**.87**			
23. My teachers care about me.	**.77**			

8. My teachers are honest with me.	**.71**			
14. I like talking to my teachers.	**.67**			
1. My teachers are fair to students.	**.56**			
10. My teachers listen to students.	**.56**			
18. The rules at my school are fair for students.	**.54**			
22. School is important for reaching my future goals.	.47			
6. My education will give me many chances to reach my future goals.	.41			
19. I am hopeful about my future.	.315			
9. Students at my school care about me.		**.80**		
11. Other students like me the way I am.		**.75**		
7. Other students respect what I have to say.		**.67**		
2. Students at my school are there for me when I need them.		**.64**		
13. I enjoy talking to students at my school.		**.60**		
15. I have some friends at school.		**.55**		
21. I feel safe at school.	***.38***	.49		
5. My family helps me when I have problems at school.			.83	
20. My family is there for me when I need them.			.71	
16. My family wants to know when something good happens at school.			.57	
3. I plan to go to college after high school.			**.45**	
17. It is important to keep learning after high school.			**.43**	
24. My family wants me to keep trying when things at school are hard.				**-1.31**

**Bolded values = item loaded on intended factor. Italicized values = cross-loadings.*

In the second grade sample that received the 5-point scale version, two TSR items (12 and 23) cross-loaded on FSL. Item 24 (FSL) demonstrated a slightly stronger factor loading on FGA than FSL. Examination of these patterns suggests students' perceived relationships with teachers closely coincides with perceptions of family support for learning. Consistent with patterns of factor loadings in the other samples, results from the 5-point, second grade sample suggest there may be some overlap in indicators of engagement for students in early elementary school. Correlations among factors, as well as relationships among subtypes of affective engagement (TSR, PSL, FSL) and between affective subtypes with a cognitive subtype of engagement (FGA), were explored following CFA.

Table 5.
Standardized Parameter Estimates in the Four-Factor 5-Point, SEI-E2 Model with Second Grade Students: Rotated Factor Loadings

Items	*TSR*	*PSL*	*FGA*	*FSL*
12. My teachers are there for me when I need them.	**.74**			*.38*
18. The rules at my school are fair for students.	**.65**			
14. I like talking to my teachers.	**.63**			
8. My teachers are honest with me.	**.60**			
21. I feel safe at school.	**.57**			
4. My teachers care about students.	**.56**			
1. My teachers are fair to students.	**.56**			
10. My teachers listen to students.	**.50**			
23. My teachers care about me.	**.44**			*.34*
9. Students at my school care about me.		**.78**		
7. Other students respect what I have to say.		**.71**		
11. Other students like me the way I am.		**.68**		
2. Students at my school are there for me when I need them.		**.56**		
15. I have some friends at my school.		**.47**		
13. I enjoy talking to students at my school.		**.33**		
22. School is important for reaching my future goals.			**.82**	
6. My education will give me many chances to reach my future goals.			**.68**	
17. It is important to keep learning after high school.			**.64**	
3. I plan to go to college after high school.			**.47**	
19. I am hopeful about my future.			**.42**	
24. My family wants me to keep trying when things at school are hard.			.36	***.32***
5. My family helps me when I have problems at school.				**.68**
20. My family is there for me when I need them.				**.64**
16. My family wants to know when something good happens at school.				**.42**

**Bolded values = item loaded on intended factor. Italicized values = cross-loadings.*

Given the multiple cross-loadings that occurred within all four-factor models, model comparisons were analyzed for adjustments in model fit when problematic items were removed in a step-wise fashion from each of the models. The exclusion of any item can affect other items that are retained in the model, therefore, resulting changes to the four-factor models were closely examined. Based on model fit indices, items 6 (FGA), 19 (FGA), and 24 (FSL) were suggested

for removal from the first grade sample. Items 23 (TSR) and 24 (FSL) were suggested for removal from the 5-point scale, second grade sample. Although item 12 (TSR) loaded on two factors, the loading on TSR was nearly twice as strong as the loading on a second factor (FSL). When the item with negative residual variance (item 24) was removed from the 3-point scale, second grade sample, item 20 demonstrated negative residual variance, which further validates overall issues with the four-factor model with this sample. Although removal of items improved the previously established good-fit of a four-factor solution, resulting standardized parameter estimates evidenced additional issues including cross-loadings of additional items and items that failed to load onto a factor. Given the importance of interpretability of models based on underlying theory, no changes were made to the intended four-factor models for the first grade and 5-point, second grade samples.

Overall, initial results of EFA suggest good fit of a four-factor solution for two versions of the SEI-E2. Several issues presented with the 3-point scale version used with second graders and the 5-point scale version functioned better overall for this grade level. Loading patterns across samples revealed most items loaded as expected on their intended factors. Within each sample, three to four items cross-loaded onto two factors. With the exception of one case, all items demonstrated stronger loadings on the expected factor than on a second factor. Indicators with cross-loadings are often considered redundant and may negatively impact the interpretability of factors and the overall measurement tool. Although cross-loaded items are often deleted prior to CFA, deletion of items in the current study resulted in loading patterns that were difficult to interpret. Instead, the presence of cross-loadings were used to inform speculation of the relationship among latent constructs and sparked interest in the functionality of individual items (e.g., item 19) with young students. Items on the SEI-E2 are grounded in

theory and are adapted from previously validated measures (Appleton et al., 2006; Carter et al., 2012; Carter, 2013). To evaluate the congruence of latent factors of the SEI-E2 with the four-factor structure of the SEI-E (Carter et al., 2012; Carter, 2013), items were specified to factors in CFA as theoretically intended to further examine the internal (construct) validity of the measure.

According to Hair and colleagues (1998), factor loadings of .30 and higher can be considered sufficient for practical purposes if the sample size is at least 300. Each of the factor loadings in the EFA analyses met this criteria, with factor loadings ranging from .31 to .78 for both first and second grade samples. With the exception of cross-loaded items and item 19 in the first grade sample, standardized parameter estimates and factor loadings (see Tables 3 and 5) revealed interpretable factor structures that are comparable with the four-factor structure of the SEI-E (Carter et al., 2012).

Following exploratory factor analyses, CFA were performed with the 3-point, first grade sample and the 5-point, second grade sample. To answer the first two research questions of the current study, items were specified to four factors as theoretically expected to allow for examination of congruence between the four-factor structure of the SEI-E with the SEI-E2 (Carter et al., 2012). CFA allows for examination of the similarity between a theoretically based model and observed response patterns of actual data (Betts, 2012). Results of the Chi-square test, RMSEA, CFI, and TLI of the forced four-factor model for both samples are reported in Table 6. For both samples, and for both versions of the SEI-E2, all model fit statistics suggest good fit of a four-factor solution. Specifically, Chi-square ($p < .001$), RMSEA ($< .05$), CFI ($\geq .95$), and TLI ($\geq .95$) values exceeded goodness-of-fit criteria, providing initial evidence of congruence between the latent factor structure of the SEI-E2 with the SEI-E (Carter et al., 2012; Carter, 2013).

Table 6.
SEI- E2 Four-Factor CFA Model Fit Indices

Grade/Version	$\chi 2$	*df*	RMSEA	CFI	TLI
1st Grade/ 3- point	251.145*	183	0.023	0.974	0.970
2nd Grade/ 5- point	306.446*	202	0.039	0.958	0.952
Goodness of Fit Guidelines			<.05[a]	≥ .95[b]	≥ .95[b]

Note. χ^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]Hu & Bentler, 1990. **p*<.001

Examination of factor loading patterns of the four-factor model with first and second grade students revealed salient loadings of all items on intended factors. CFA factor loadings ranged between .40 and .84 for first grade students and between .42 and .77 for second grade students. Although .30 is considered an acceptable threshold for practical reasons (Hair et al., 1998), .40 and above is typically considered salient in applied research (Brown, 2006). All factor loadings of the SEI-E2 met or exceeded this criterion and are presented in Tables 7 and 8. Overall, results of CFA provide preliminary evidence that the four-factor structure of the SEI-E (Carter et al., 2012; Carter, 2013), is consistent with the latent factor structure of the SEI-E2 and suggests continuity in the engagement construct in elementary school.

Table 7.
Factor Loading Patterns of the Forced Four-Factor CFA Model for the SEI- E2 with First Grade Students

Items	*TSR*	*PSL*	*FGA*	*FSL*
23. My teachers care about me.	.71			
21. I feel safe at school.	.68			
18. The rules at my school are fair for students.	.65			
14. I like talking to my teachers.	.64			
4. My teachers care about students.	.63			
12. My teachers are there for me when I need them.	.61			
1. My teachers are fair to students.	.61			
8. My teachers are honest with me.	.55			

10. My teachers listen to students.	.48			
9. Students at my school care about me.		.69		
11. Other students like me the way I am.		.65		
13. I enjoy talking to students at my school.		.56		
2. Students at my school are there for me when I need them.		.55		
15. I have some friends at my school.		.54		
7. Other students respect what I have to say.		.53		
17. It is important to keep learning after high school.			.70	
22. School is important for reaching my future goals.			.63	
19. I am hopeful about my future.			.59	
3. I plan to go to college after high school.			.47	
6. My education will give me many chances to reach my future goals.			.42	
24. My family wants me to keep trying when things at school are hard.				.84
20. My family is there for me when I need them.				.60
16. My family wants to know when something good happens at school.				.54
5. My family helps me when I have problems at school.				.40

Table 8.
Factor Loading Patterns of the Forced Four-Factor CFA Model for the SEI- E2 with Second Grade Students

Items	*TSR*	*PSL*	*FGA*	*FSL*
12. My teachers are there for me when I need them.	.75			
23. My teachers care about me.	.72			
14. I like talking to my teachers.	.69			
1. My teachers are fair to students.	.69			
4. My teachers care about students.	.69			
21. I feel safe at school.	.66			
18. The rules at my school are fair for students.	.65			
8. My teachers are honest with me.	.63			
10. My teachers listen to students.	.55			
9. Students at my school care about me.		.77		
11. Other students like me the way I am.		.71		
7. Other students respect what I have to say		.65		
15. I have some friends at my school.		.61		
2. Students at my school are there for me when I need them.		.60		
13. I enjoy talking to students at my school.		.42		
22. School is important for reaching my future goals.			.75	
17. It is important to keep learning after high school.			.67	
19. I am hopeful about my future.			.63	

6. My education will give me many chances to reach my future goals.	.59	
3. I plan to go to college after high school.	.45	
24. My family wants me to keep trying when things at school are hard.		.72
20. My family is there for me when I need them.		.65
16. My family wants to know when something good happens at school.		.64
5. My family helps me when I have problems at school.		.62

Results of EFA suggested overlap among factors on the SEI-E2. Conceptually, affective subtypes of engagement (TSR, PSL, and FSL) are expected to demonstrate stronger correlations with each other than with a cognitive subtype of engagement (FGA). Examination of factor loadings in EFA suggested items intended to measure FGA often loaded on factors representing affective subtypes of engagement, such as FSL and TSR. Across the three sample subjected to EFA, several items cross-loaded on two factors, suggesting the possibility that subtypes of engagement are not as distinct for students in early elementary school. It is plausible that relationships underlying subtypes of engagement reflects the developmental nature of engagement for young students.

Correlational analyses were employed to statistically evaluate relationships among factors for first and second grade students and are reported in Tables 9 and 10. Relationships evidenced among factors support inferences drawn from pattern loadings in EFA. For first grade students, FSL correlated strongly with TSR. Both FSL and TSR demonstrated significant correlations with FGA. Although PSL demonstrated significant correlations with other factors, FSL and TSR were most strongly related to FGA for first graders. For second grade students, the relationship between FSL and TSR was less strong, but still significant. For this age group, PSL was more strongly related to FGA. Whereas for first graders FSL and TSR demonstrate

strong correlations with FGA, PSL is as strongly related to FGA for second grade students as FSL and TSR. This suggests that relationships with peers become nearly equally as important as family support for learning and teacher-student relationships for students in second grade, and that relationships with teachers become less dependent on family support for learning over time.

Table 9.
Correlations between Factors in the SEI-E2 Four-Factor Model with First Grade Students

	TSR	PSL	FGA	FSL
TSR	----			
PSL	0.257*	----		
FGA	0.566*	0.293*	----	
FSL	0.612*	0.315*	0.606*	----

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

Table 10.
Correlations between Factors in the SEI-E2 Four-Factor Model with Second Grade Students

	TSR	PSL	FGA	FSL
TSR	----			
PSL	0.389*	----		
FGA	0.442*	0.433*	----	
FSL	0.372*	0.448*	0.459*	----

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

In SEI-E validation studies, researchers found that relationships between affective and cognitive subtypes of engagement were not significantly different from relationships among affective subtypes (Carter et al., 2012; Carter, 2013). In the current study, affective subtypes of engagement strongly correlated with a cognitive subtype of engagement. For students in early elementary school, this finding could suggest that the development of cognitive engagement is strongly influenced by developing affective engagement. The subtype(s) of affective

engagement most central to the development of cognitive engagement likely change as students get older and peer influences become more important. Betts (2012) posited that significant relationships between affective and cognitive subtypes of engagement could suggest the presence of a general factor of engagement. Although additional research is needed before conclusions can be drawn for either argument, results of the current study suggest relationships among engagement subtypes may reflect theoretically relevant information on the developmental nature of student engagement in elementary school.

Evidence of Internal Consistency. Cronbach's alpha (α), a measure of scale reliability, was calculated for SEI-E2 total scores and for individual subscales to evaluate the internal consistency of the measure for both samples. Alpha values represent the degree to which items measure the same construct. Generally, α values greater than 0.7 are considered good, <0.7 are considered questionable, and those <0.6 are considered poor (Nunnally, 1978). In previous SEI and SEI-E validation studies, α values greater than 0.6 were reported for acceptable reliability and values greater than 0.7 were accepted as evidence of good reliability (Appleton et al., 2006; Carter et al., 2012; Carter, 2013).

Reliability estimates of the 3-point scale version of the SEI-E2 with first grade students are presented in Table 11. For this sample, the SEI-E2 total score and the TSR and PSL subscales demonstrated acceptable to good reliability. Conversely, the FGA and FSL subscales demonstrated poor reliability. This finding is perhaps unsurprising given the significant correlations and observed overlap among these factors for this sample and in prior SEI-E studies (Carter et al., 2012; Carter, 2013). Together, these results suggest the SEI-E2 total score may be the most useful for understanding reported levels of engagement for first grade students. For

young children, measurement of subtypes of engagement may be less beneficial than for older students due to the developmental nature of the engagement construct.

Table 11.
Internal Consistency Estimates for SEI-E2 Total Score and Subscales for First Grade Students

Scale	Coefficient alpha value (α)
Total Score	.8124
TSR	.7298
PSL	.6223
FGA	.5124
FSL	.4614

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

Cronbach's α values for the second grade sample that completed the 5-point scale version of the SEI-E2 were in the acceptable to good range (Table 12). Consistent with the pattern of α values for the first grade sample, the total score demonstrated greatest reliability, followed by the TSR, PSL, FGA, and FSL subscales. The pattern of these findings is consistent with reliability estimates calculated for the SEI and SEI-E subscales (Appleton et al., 2006; Carter et al., 2012; Carter, 2013) and provides initial evidence that the SEI-E2 is a reliable measure of affective and cognitive engagement for second grade students.

Table 12.
Internal Consistency Estimates for SEI-E2 Total Score and Subscales for Second Grade Students

Scale	Coefficient alpha value (α)
Total Score	.8497
TSR	.8179
PSL	.7333
FGA	.6102
FSL	.6055

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

Overall, estimates of internal consistency for the SEI-E2 suggest stronger overall reliability of the SEI-E2 for use with second grade students than with first grade students. Importantly, first and second grade students completed different form versions and the impact of this should be explored in future studies. For the first grade sample, the FGA and FSL subscales demonstrated poor reliability, providing additional evidence of a lack of distinction between subtypes of engagement for early elementary school students. Although individual subscale scores may be uninterpretable for first grade students, the total score may prove useful as a reliable indicator of overall engagement. For students in second grade, distinction among subtypes of engagement is more apparent. The current study provides initial evidence of the reliability of both factor scores and the total score of the SEI-E2 for measuring the affective and cognitive engagement of second grade students.

Research Question Three

Previous research has supported the external validity of the SEI (Appleton et al., 2006) and SEI-E (Carter et al., 2012; Carter, 2013) by establishing significant correlations between self-reported engagement and observable indicators of engagement (e.g., attendance) and with demographic variables commonly associated with dropout risk (e.g., disability status). Due to the non-normal distribution of categorical data, Spearman's Rho correlations (a nonparametric procedure) were calculated for correlation analyses. For both first and second grade samples in the current study, all factors correlated with each other as expected. Due to the low reliability of the FGA and FSL subscales of the SEI-E2 with first grade students, relationships between the SEI-E2 total score and variables of interest were more closely examined for this sample. Presented in Table 13, correlations suggested SEI-E2 total scores generally correlated in the expected direction with attendance, tardies, and demographic variables. However, only one

statistically significant correlation was revealed between overall engagement and tardies. Although several correlations appeared in the expected direction, the external validity of the SEI-E2 cannot be substantiated for first grade students due to the low number of significant correlations with variables of interest.

As presented in Table 14, variables in the second grade sample demonstrated significant correlations in the expected direction with SEI-E2 subscales and the SEI-E2 total score. Overall, several more significant correlations were evidenced with the second grade sample than with the first grade sample, providing stronger evidence of external validity of SEI-E2 scores for second grade students. A potential limitation of using attendance and tardies as indicators of behavioral engagement for young children is that parents and caregivers espouse greater control over student's attendance than for older students. In the current study, significant relationships were not demonstrated between attendance and reported levels of engagement. Achievement scores, another indicator of academic engagement, also did not demonstrate significant correlations with engagement scores. Correlations between engagement and demographic variables (e.g., ELL, SWD) were generally in the direction expected but not significant. The only demographic variable that demonstrated significant correlation with SEI-E2 factor scores and the total score was FRPL. This finding suggests that students from low-income backgrounds are most at-risk for lower levels of student engagement in early elementary school. Together, these findings suggest more research is needed before the concurrent and predictive validity of the SEI-E2 can be determined. Overall, validity evidence of the current study suggests the SEI-E2 may be more beneficial for practical use for second grade students than for first grade students.

Table 13.
Spearman's Rho Correlations between Factor Scores and Associated Variables for First Grade

	TSR	PSL	FGA	FSL	Absent	Tardy	SWD	ELL	FRPL	SEI-E2 Total
TSR	1.00									
PSL	.881**	1.00								
FGA	877**	.795**	1.00							
FSL	.869**	.838**	.936**	1.00						
Absent	-.024	.-009	-.047	-.028	1.00					
Tardy	-.058	-.010	-.032	-.002	.280**	1.00				
SWD	-.034	-.024	-.017	-.017	-.004	.036	1.00			
ELL	-.026	-.028	-.034	-.034	.096*	.008	-.027	1.00		
FRPL	0.071	.077*	.060	.058	.105**	.052	-.010	.318**	1.00	
SEI-E2 Total	.864**	.848**	.839**	.848**	-.028	-.083*	-.028	-.034	0.031	1.00

**. Correlation is significant at the 0.01 level (2-tailed). SWD= Student with Disability
*. Correlation is significant at the 0.05 level (2-tailed). ELL= English Language Learner
FRPL= Free/Reduced Price Lunch

Summary of Findings

The current study examined reliability and validity evidence of the SEI-E2 as a measure of cognitive and affective engagement for first and second grade students. Overall, most students reported moderate to high levels of engagement, which is consistent with findings of SEI and SEI-E studies (Appleton et al., 2006; Carter et al., 2012; Carter, 2013). Results of EFA suggested good-fit of a four-factor solution for each sample, despite several cross-loadings of items on multiple factors. For the first grade and 5-point, second grade samples, most items loaded as expected and factor structures were generally consistent with that of the SEI-E (Carter, 2013; Carter et al., 2012). For these samples, cross-loaded items suggested some overlap among factors that may prove important for understanding the developmental nature of engagement in early elementary school.

When the 3-point scale version of the SEI-E2 was completed by second grade students, item loadings did not result in interpretable factors and negative residual variance was demonstrated. It is possible that limited variation in responses choices resulted in more extreme-end responding, thereby decreasing the specificity of scores. Given the lack of construct validity evidence for this sample due to the multiple issues that presented, the 5-point scale version of the SEI-E2 was deemed a better measure of cognitive and affective engagement for second grade students. As a result, data from the 3-point scale, second grade sample were excluded from subsequent analyses.

Most germane to the purpose of the current study was the extent to which the intended four-factor structure of the SEI-E was replicated with the SEI-E2 (Carter et al., 2012; Carter, 2013). Model fit indices of EFA and CFA supported a four-factor structure of the SEI-E2 that is consistent with the SEI-E: Teacher Student Relationships (TSR), Peer Support for Learning

(PSL), Future Goals and Aspirations (FGA), and Family Support for Learning (FSL). Correlations among factors supported relationships observed in EFA and highlights the developmental nature of engagement. In first grade, family support for learning, in and of itself, closely correlates with teacher-student relationships. Also for first grade students, FGA is most strongly related to FSL and TSR. The magnitude of this relationship decreases for students in second grade, and peer support for learning becomes more important. By second grade, FSL, TSR, and PSL all correlate with FGA. Overall, from first to second grade, different aspects of affective engagement are more pertinent to the development of cognitive engagement. Knowledge of the developmental nature of engagement in early elementary school may better inform prevention and intervention efforts by highlighting the importance of connections between home and school and early school experiences.

Initial reliability and validity evidence of the SEI-E2 was stronger for students in second grade than for first grade students. For first graders, two subscales (FSL and FGA) failed to meet threshold for acceptable reliability. As a result, the total score of the SEI-E2 is likely the best indicator of overall engagement for these students. For second graders, all subscales and the SEI-E2 total score demonstrated acceptable to good reliability. External validity evidence was scarce for both samples, limiting the conclusiveness of the criterion and predictive validity of the SEI-E2. In the current study, second grade students from low-income backgrounds (FRPL indicator) demonstrated lower scores on each subscale of the SEI-E2 and suggests this demographic characteristic is a strong and indicator of risk for poor engagement in early elementary school. Given the lack of external validity evidence in the current study, more research is needed before generalizations can be made.

Table 14.
Spearman's Rho Correlations between Factor Scores and Associated Variables for Second Grade

	TSR	PSL	FGA	FSL	Absent	Tardy	SWD	ELL	FRPL	Reading	Math	SEI-E2 Total
TSR	1.00											
PSL	.664**	1.00										
FGA	.728**	.566**	1.00									
FSL	.848**	.716**	.757**	1.00								
Absent	.024	.051	-.012	-.002	1.00							
Tardy	-.056	-.046	-.036	.019	.192**	1.00						
SWD	-.002	-.003	.032	.046	.104	.041	1.00					
ELL	.051	-.028	-.003	-.034	.043	.110*	.221**	1.00				
FRPL	-.162**	-.096	-.163**	-.150**	.105**	.099	.072	.097	1.00			
Reading	.021	.030	.059	.021	-.060	-.110	-.190**	-.223**	-.246**	1.00		
Math	.003	.056	.071	.013	-.091	-.052	-.165**	-.214**	-.199**	.687**	1.00	
SEI-E2 Total	.885**	.846**	.784**	.877**	.022	-.048	.005	.012	-.175**	.072	.080	1.00

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
SWD= Student with Disability
ELL= English Language Learner
FRPL= Free/Reduced Price Lunch

CHAPTER 5

DISCUSSION

High school graduation is associated with multiple positive outcomes for students in the United States, such as greater income and better health (Rumberger & Rotermund, 2012). Unfortunately, approximately 20% of students leave school prematurely (DePaoli et al., 2015; Snyder & Dillow, 2015). Referred to as a national epidemic (Finn, 1989), dropout has elicited the attention of policymakers, educators, and other key stakeholders for several decades due to the significant social and economic burdens associated with those who drop out (Education Week, 2010; Reschly & Christenson, 2012; Rumberger, 2011). Several demographic groups demonstrate consistently lower graduation rates, including students from low-income backgrounds, ethnic and racial minorities, and students with disabilities (AEE, 2011; Ingels & Dalton, 2013; Reschly & Christenson, 2006b). Sparked by the need for prevention and intervention efforts to curtail dropout, researchers have identified variables that are alterable and amenable to intervention, such as school climate, sense of belonging, and academic success, to differentiate risk among high-risk demographic groups (Christenson et al., 2001). Together, this research emphasizes the importance of context in addressing dropout risk (Reschly & Christenson, 2012).

The field of student engagement emerged from seminal work in dropout theory (Finn, 1989) and has shifted focus to promoting school completion (Christenson et al., 2001; Christenson & Thurlow, 2004; Reschly & Christenson, 2006a; Reschly & Christenson, 2012). By acknowledging the interplay of contextual influences on and between thoughts and feelings

about school, academic achievement, and behavior, student engagement holds promise as the central construct for promoting student success and decreasing dropout risk (Reschly & Christenson, 2012). Although researchers disagree on the definition and measurement of engagement, consensus has been reached that the construct is multidimensional and is directly related to student outcomes across academic, behavioral, social, and emotional domains (Appleton et al., 2008; Fredericks et al., 2004; Reschly & Christenson, 2012).

Appleton and colleagues espouse four subtypes of engagement: academic, behavioral, cognitive, and affective (Appleton et al., 2006; Reschly & Christenson, 2006a, 2012). In this model, cognitive and affective engagement mediate academic and behavioral engagement. Created as a measure of the internal aspects of engagement (e.g., cognitive and affective), the Student Engagement Instrument (SEI) and the Student Engagement Instrument, Elementary Version (SEI-E), prove valuable as measures for students in third grade through college (Appleton et al., 2006; Betts et al., 2010; Carter et al., 2012; Carter, 2013; Grier-Reed et al., 2012; Lovelace et al, 2014). Importantly, early school experiences have a direct correlation with long-term academic outcomes (Mirkhil, 2010; Pianta & Cox, 1999). To date, research is lacking on student engagement in early elementary school and there are currently no published measures of engagement for this age group (Fredericks & McColskey, 2012).

The present study served as a pilot study of the Student Engagement Instrument, Elementary Version, 2nd Edition (SEI-E2), which is a downward extension of the Student Engagement Instrument, Elementary Version (SEI-E) that was designed for students in third through fifth grade (Carter et al., 2012). Because of research outlining nuances of self-report with young children, the SEI-E2 was piloted using two versions to assess the functionality of various response choice options (Chambers & Johnston, 2002). Three samples resulted and the

3-point scale version was piloted with both first and second grade students, and the 5-point scale version was piloted with a separate group of second grade students.

EFA was conducted to explore pattern loadings and CFA was conducted to evaluate the congruence of fit of the forced four-factor model of the SEI-E with current data (Carter et al., 2012; Carter, 2013). Pattern loadings in EFA suggested overlap among factors as evidenced by cross-loaded items within each sample. For the first grade and the 5-point, second grade samples, multiple model fit statistics in EFA and CFA suggested good fit (e.g., RMSEA ≤ 0.5, CFI ≥ 0.95, TLI ≥ 0.95), of the four-factor model of the SEI-E (Carter et al., 2012; Carter, 2013): Teacher Student Relationships (TSR), Peer Support for Learning (PSL), Future Goals and Aspirations (FGA), and Family Support for Learning (FSL). For second grade students, the four-factor model functioned best when a 5-point scale version was used. Issues with the 3-point scale with second graders included poor interpretability of factors and the measurement issue of negative residual variance. Based on these issues, data from this sample were excluded from additional analyses.

Observed pattern loadings in EFA suggested overlap among factors, and overlap was supported by statistically significant correlations among factors for both samples. In first grade, FSL was significantly related to TSR, and FSL and TSR were strongly related to FGA. In second grade, PSL became more important, and FSL, TSR, and PSL were all generally equal in their relationship to FGA. Internal reliability evidence further supported the overlap between FSL and FGA for first grade students. Although the SEI-E2 total score ($\alpha = .81$) and the TSR and PSR factors were reliable for first grade students, the FGA and FSL factors failed to meet the .60 threshold for reliability (Appleton et al., 2006; Nunnally, 1978). Therefore, the total score may be interpreted as an overall indicator of engagement but interpretation of subscale scores it

not recommended. It is plausible that the FGA and FSL factors demonstrated poor reliability due to the strong correlation between these two factors, which may reflect the developmental influences on the engagement construct.

For the second grade sample, when using a 5-point scale version of the SEI-E2, all subscale scores and the total score ($\alpha = .85$) evidenced sound internal reliability (Nunnally, 1978). For both samples, external validity evidence was lacking. Spearman's Rho correlations were conducted and significant for only one variable. For second grade students, an indicator of low socioeconomic status (free or reduced-price lunch/FRPL), was significant across subscales and the total score. Correlations were in the general direction expected (e.g., positive correlations with achievement, negative correlations with high-risk demographic groups), but lacked statistical significance. The failure of self-reported engagement to significantly correlate with variables of interest may represent issues with the variables included in the current study and future studies should seek to identify more appropriate indicators of behavioral and academic engagement for young students. It is also possible that the failure of SEI-E2 scores to correlate significantly with outcomes of interest (e.g., attendance and achievement) is because, these relationships are less established in early elementary school and become stronger over time.

Overall, results of the current study suggest consistency of the factor structure of the SEI-E2 with that of the SEI-E (Carter et al., 2013; Carter, 2013). Initial reliability and validity evidence of the SEI-E2 is stronger for use with second grade students, and the practical implications of scores with either group have yet to be established. Underlying the goal of developing a measurement tool of cognitive and affective engagement for young children, a primary purpose of the current study was to examine the nature of engagement in early

elementary school. By providing initial evidence of consistent factor structure of the SEI-E2 with the SEI-E, results of the current study suggest continuity in the engagement construct in elementary school but also highlight developmental changes in the importance of various factors of engagement for young students (Carter et al., 2012; Carter, 2013). By integrating this knowledge with prevention and intervention efforts, educators can promote a strong foundation for students that may have far-reaching impact on later outcomes, including dropout risk (Alexander, et al., 1997; Christenson & Reschly, 2010; Mirkhil, 2010; Rumberger & Rotermund, 2012).

Limitations and Directions for Future Research

Results of the current study provide initial evidence of the utility of the SEI-E2 as a self-report measure of student engagement in early elementary school. There are, however, several limitations to the current study, including administration procedures, statistical methods followed, and the generalizability of the results. Scale validation requires several replications of findings across multiple samples, and the results of the current study serve as the first glimpse of measurement of student engagement in early elementary school.

Participants of the current study were from GCPS, an urban school district in the southeastern United States. Demographic information of the schools and classrooms included in the study were not provided, and these factors negatively impact the generalizability of the current results to other populations. Additional research is also needed with students from rural backgrounds and in other regions of the country before results can be generalized. Students with disabilities were included in the current study, and all disability categories were included due to the low number of students identified with a low-incidence disability (n=2). Future research

should evaluate whether to include all students with disabilities or just those with high-incidence disabilities (Reschly & Christenson, 2006b).

Second, the SEI-E2 was administered via passive consent to entire classes of students. Items were was read aloud by teachers while students independently provided responses on the forms. Several of the completed forms contained inaccurate student identification numbers, resulting in data on these forms to be excluded from analyses. Future studies should consider more appropriate administration procedures of the SEI-E2 with young students. It may prove beneficial to have an adult complete the identifying information sections, and administration via interview format may reduce the influence of reading difficulties and may improve student understanding of items and more accurate responding. Further, students may benefit from practice with response choice options prior to completing the SEI-E2 (Chambers & Johnston, 2002).

Third, two versions of the SEI-E2 were piloted with second grade students but only one version was piloted with first grade. Results of the study found the 5-point scale version functioned better overall than the 3-point scale version with second graders. The 5-point scale version was not piloted with first graders due to research suggesting the tendency of children this age to respond on the extreme-end to items, despite the number of response choice options provided (Chambers & Johnston, 2002). To improve consistency of the SEI-E2 for first and second grade students, future studies should evaluate the utility of a 5-point scale version with both grades.

Fourth, there are several statistical and methodological limitations. Although the overall sample size was similar to that of SEI and SEI-E validation studies, the sample sizes of the three individual samples were considerably smaller. Typical scale validation procedures require using

split-half samples when conducting EFA and CFA so that models suggested through EFA can be cross-validated. Items on the SEI-E2 are grounded in theory of the engagement construct (e.g., Appleton et al., 2006; Christenson et al., 2008) and split-half procedures were not pertinent to accomplishing the current goal of replicating a previously validated model, which is accomplished through CFA. The small sample size of each sample also impeded the use of split-half procedures. If the goal of future studies is to examine the fit of different models with the SEI-E2, the use of larger sample sizes will allow for cross-validation of models within the same study.

In the current study, several items demonstrated cross-loadings within each sample and overlap was evidenced among factors. For the first grade sample, two subscale scores demonstrated poor reliability. Future studies should closely examine items that behaved poorly for wording and ambiguity in the content of the item. Importantly, when all items were included and subjected to CFA, each item demonstrated salient loadings with the appropriate factor. Development of a single measure of engagement across elementary school may also be of future interest, given the initial suggestion of consistency in the latent factor structure of student engagement in grades one through five.

Examining the external validity of the SEI-E2 is an important direction for future research. In the current study, only Free- or Reduced- Price Lunch (FRPL) significantly correlated with engagement scores for second grade students, suggesting a strong link between low socioeconomic status and risk for low engagement. Research has shown that behavioral indicators of engagement are evident as early as first grade (Alexander et al., 1997). Indicators of behavioral engagement in the current study included absences and tardies. This proves problematic because school attendance for elementary students is largely under the control of

parents and guardians. Discipline referral data, which were used in SEI and SEI-E studies, were not included due to the low frequency of occurrences in early elementary school (Appleton et al., 2006; Carter et al., 2012). Achievement test scores were used as indicators of academic engagement, but were only available for second grade students. In future studies of the external validity of the SEI-E2, researchers should seek to identify more appropriate indicators of behavioral and academic engagement that are more meaningful for students in early elementary school.

Conclusions

Connecting student engagement research with research on the importance of early school experiences is a critical endeavor. Born from research on dropout, the construct of student engagement acknowledges the developmental process underlying the decision to drop out and reiterates the importance of early school experiences in promoting positive outcomes for all students, including the goal of school completion (Appleton et al., 2006, 2008; Finn, 1989; Finn & Zimmer, 2012; Reschly & Christenson, 2012). Central to student engagement is the recognition of contextual influences on student outcomes, and interventions and supports can be provided at the individual, family, and school levels (Reschly & Christenson, 2006a; Rumberger & Rotermund, 2012). Developed to address the need of understanding the cognitive and affective needs of students, the SEI allows for identification of students at-risk for dropping out (Appleton et al., 2006). Although distal for early elementary school students, dropout is the outcome of a cumulative process of disengagement with school (Finn, 1989). The SEI-E and SEI-E2 hold promise as measures of engagement for students in elementary school (Carter et al., 2012). Future research with the SEI-E2, examining the nature and development of engagement

in the formative years of schooling, has the potential to inform practices that may have far-reaching consequences for children and society at large.

REFERENCES

Alexander, K., Entwistle, D., & Horsey, C. (1997). From first grade forward: Early foundations of high school dropout. *Sociology of Education, 70,* 87-107.

Alliance for Excellent Education (2011). The High Costs of High School Dropouts: What the Nation Pays for Inadequate High Schools. November 2011. Retrieved September 28, 2015 from: http://all4ed.org/wpcontent/uploads/2013/06/HighCost.pdf

Appleton, J.J., Christenson, S.L., & Furlong, M.J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45,* 369-386.

Appleton, J.J., Christenson, S.L., Kim, D., & Reschly, A.L. (2006). Measuring cognitive and psychological engagement: Validation of the Student Engagement Instrument. *Journal of School Psychology, 44,* 427-445.

Asparouhov, T., & Muthén, B. (2010). Weighted least squares estimation with missing data. Technical appendix. Los Angeles: Muthén & Muthén.

Bandalos (2011). *Item Analysis*. Class Lecture. The University of Georgia.

Barclay, J.R., & Doll, B. (2001). Early prospective studies of the high school dropout. *School Psychology Quarterly, 16,* 357-369.

Betts, J.E. (2012). Issues and Methods in the Measurement of Student Engagement: Advancing the Construct through Statistical Modeling. *Handbook of Research on Student Engagement.*

Betts, J., Appleton, J.J., Reschly, A.L., Christenson, S.L., & Huebner, E.S. (2010). A study of the reliability and factorial invariance of the Student Engagement Instrument (SEI) across multiple grades. *School Psychology Quarterly, 25*, 84-93.

Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues*, 187-249.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research.* New York, NY: Guilford Press, Inc.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Carter, C.P. (2013). Early Student Engagement (Doctoral dissertation). Retrieved from U of Georgia Catalog, EBSCO*host.*

Carter, C.P., Reschly, A.L., Lovelace, M.D., Appleton, J.J., & Thompson, D. (2012). Measuring student engagement among elementary students: Pilot of the Student Engagement Instrument – Elementary Version. *School Psychology Quarterly, 27*(2), 61-73.

Chambers & Johnston (2002). Developmental differences in children's use of rating scales. *Journal of Pediatric Psychology, 27*(1), 27-36.

Christenson, S.L. (2008, January 22). Engaging students with school: The essential dimension of dropout prevention programs. [Webinar]. National Dropout Prevention Center for Students with Disabilities.

Christenson, S. L., & Reschly, A. L. (2010). Check & Connect: Enhancing school completion through student engagement. In B. Doll, W. Pfohl, & J. Yoon (Eds.). Handbook of youth

prevention science (pp. 327–348). New York, NY: Routledge. Retrieved from http://books.google.com/books?id=1cRfCQ5xs30C&pg=PA327

Christenson, S.L., Reschly, A.L., & Wylie, C. (2012). Preface. *Handbook of Research on Student Engagement.*

Christenson, S.L., Sinclair, M.F., Lehr, C.A., & Godber, Y. (2001). Promoting successful school completion: Critical conceptual and methodological guidelines. *School Psychology Quarterly*, 16, 468-484.

Christenson, S.L., & Thurlow, M.L. (2004). Keeping kids in school: Efficacy of Check & Connect for dropout prevention. *NASP Communiqué*, *32*(6), 37-40.

Christenson, S.L., Thurlow, M.L., Sinclair, M.F., Lehr, C.A., Kaibel, C.M., Reschly, A.L., Mavis, A., & Pohl, A. (2008). Check & Connect: A comprehensive student engagement intervention manual.

Connell, J.P., & Wellborn, J.G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. *Self process and development: The Minnesota symposia on child development.*

DePaoli, J.L., Fox, J.H., Ingram, E.S., Maushard, M., Bridgeland, J.M., & Balfanz, R. (2015). *Building a Grad Nation: Progress and Challenge in Ending the High School Dropout Epidemic – 2015 Annual Update*. Washington, D.C.: Civic Enterprises, the Everyone Graduates Center at Johns Hopkins University School of Education, America's Promise Alliance, and the Alliance for Excellent Education. Retrieved on September 28, 2015 from: http://gradnation.org/sites/default/files/18006_CE_BGN_Full_vFNL.pdf

Doll, B., & Hess, R. (2001). Through a new lens: Contemporary psychological perspectives on school completion and dropping out of high school. *School Psychology Quarterly, 16*, 351-356.

Education Week (June 10, 2010). Diplomas Count 2010: Graduation by the numbers: Putting data to work for student success. Washington, DC: Education Week. Retrieved September 28, 2015 from: http://www.edweek.org/ew/toc/2010/06/10/index.html

Finney, S.J., & DiStefano, C. (2006). Non-normal and categorical data in structural equation modeling. *Structural equation modeling: A second course, 10*(6), 269-314.

Finn, J.D. (1989). Withdrawing from school. *Review of Educational Research, 59*, 117-142.

Finn, J.D. (1993). *School engagement and students at risk* (NCES report 93-470). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Finn, J.D., & Zimmer, K. (2012). Student engagement: What is it? Why does it matter? *The Handbook of Research on Student Engagement*.

Fredericks, J.A., Blumenfeld, P.C., & Paris, A.H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*, 59-109.

Fredericks, J.A., & McColskey, W. (2012). The Measurement of Student Engagement: A Comparative Analysis of Various Methods and Student Self-report Instruments. *The Handbook of Research on Student Engagement*.

Fredericks, J., McColskey, W., Meli, J., Mordica, J., Montrosse, B., & Mooney, K. (2011). Measuring student engagement in upper elementary through high school: a description of 21 instruments (Issues & Answers Report, REL 2011-No. 098). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education

Evaluation and Regional Assistance, Regional Educational Laboratory Southeast. Retrieved from http://ies.ed.gov/ncee/edlabs.

Goodenow, C. (1991). The sense of belonging and its relationship to academic motivation among pre- and early adolescent students. Paper presented at the annual meeting of the American Edicational Research Association, Chicago, IL. (ERIC Document Reproduction Service No. ED335151).

Grier-Reed, T.L., Appleton, J.J., Rodriguez, M., Ganuza, Z.M., & Reschly, A.L. (2012). Exploring the Student Engagement Instrument and career perceptions with college students. *Journal of Educational and Developmental Psychology, 2*(2), 85-96.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., & Tatham, R.L. (1998). *Multivariate data analysis* (Vol. 5, No. 3, pp. 207-219). Upper Saddle River, NJ: Prentice hall.

Hu, L.T., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, *6*(1), 1-55.

Heckman, J.J., & LaFontaine, P.A. (2010). The American high school graduation rate: Trends and levels. *The Review of Economics and Statistics*, 92, 244-262.

Ingels, S.J., & Dalton, B. (2013). *High School Longitudinal Study of 1009 (HSLS:09) First Follow-up: A First Look at Fall 2009 Ninth-Graders in 2012* (NCES 2014-360). U.S. Department of Education. Washington, D.C.: National Center for Education Statistics. Retrieved September 28, 2015 from: http://nces.ed.gov/pubs2014/2014360.pdf

Jimerson, S.R., Campos, E., & Greif, J.L. (2003). Toward an understanding of definitions and measures of school engagement and related terms. *California School Psychologist, 8*, 7-27.

Jordan, W.J., McPartland, J.M., & Lara, J. (1999). Rethinking the causes of high school dropout. *The Prevention Researcher, 6*, 1-4.

Jöreskog, K. G. (1999). How large can a standardized coefficient be. *Unpublished Technical Report. Retrieved from: http://www.ssicentral.com/lisrel/techdocs/HowLargeCanaStandardizedCoefficientbe.pdf*.

Kaiser, H.F. (1960). The application of electronic computers to factor analysis. *Educational and psychological measurement, 20*(1), 141-151.

Kirsch, I., Braun, H., Yamamoto, K., & Sum, A. (2007). *America's perfect storm: Three forces changing our nation's future*, 1-34, Princeton, N.J.: Educational Testing Service.

Klem, A.M., & Connell, J.P. (2004). Relationships matter: Linking teacher support to student engagement and achievement. *Journal of School Health, 74*, 262-273.

Kline, R.B. (2005). *Principles and practice of structural equation modeling* (2nd Ed.).New York, NY: Guilford

Kline, R.B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: Guilford Press.

Kovacs, M. (2011). *Children's Depression Inventory Manual*. North Tonawanda, NY: Multi-Health Systems, Inc.

Lovelace, M., Reschly, A.L., Appleton, J.J., & Lutz, M. (2014). Concurrent and predictive validity of the Student Engagement Instrument. *Journal of Psychoeducational Assessment, 32*, 509-520.

Maehr, M.L. & Meyer, H.A. (1997). Understanding motivation and schooling: Where we've been, where we are, and where we need to go. *Educational Psychology Review*, 9, 371-408.

Mahatmya, D., Lohman, B.J., Matjasko, J.L., & Farb, A.F. (2012). Engagement across developmental periods. *Handbook of Research on Student Engagement*.

Martin, A.J. (2007). Examining a multidimensional model of student motivation and engagement using a construct validation approach. *British Journal of Educational Psychology, 77,* 413-440.

Martin, A.J. (2012). Motivation and engagement: Conceptual, operational and empirical clarity. Section Commentary in *The Handbook of Research on Student Engagement.*

McCabe, P.C., Altamura, M. (2011). Empirically valid strategies to improve social and emotional competence of preschool children. *Psychology in the Schools, 48*(5), 513-540.

Mirkhil, M. (2010). 'I want to play when I go to school': Childrens' views on the transition to school from kindergarten. *Australasian Journal of Early Childhood, 35*(3), 134-139.

Mosher, R., & McGowan, B. (1985). *Assessing student engagement in secondary schools: Alternative conceptions, strategies of assessing, and instruments*. University of Wisconsin, Research and Development Center. (ERIC Document Reproduction Service No. ED 272812).

Muthén, L.K., & Muthén, B.O. (1998-2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

National Research Council and the Institute of Medicine. (2004). *Engaging schools: Fostering high school students' motivation to learn*. Washington, DC: The National Academies Press.

Nunnally, J. C. (1978). *Psychometric theory*, 2nd ed. New York: McGraw-Hill.

Pianta, R. C., & Cox, M. J. (1999). Kindergarten teachers' practices related to the transition to school: Results of a national survey. *Elementary School Journal, 100*(1), 71.

Skinner, E.A., & Pitzer, J.R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. *The Handbook of Research on Student Engagement.*

Smith, H.P. (1943). A study in the selective character of American secondary education: Participation in school activities as conditioned by socioeconomic status and other factors. *Journal of Educational Psychology, 34*, 229-246.

Snyder, T.D., & Dillow, S.A. (2015). *Digest of Education Statistics 2013* (NCES 2015-011). National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

Reeve, J. (2012). A Self-determination Theory Perspective on Student Engagement. *The Handbook of Research on Student Engagement.*

Reschly, A.L., Betts, J., & Appleton, J.J. (2012). Student Engagement Instrument: Evidence of convergent and divergent validity across measures of engagement and motivation. *International Journal of School & Educational Psychology*, *2*(2), 106-114.

Reschly, A.L., & Christenson, S.L. (2006a). Promoting School Completion. In G. Bear & K. Minke (Eds.), *Children's Needs III: Understanding and addressing the developmental needs of children* (pp. 103-113). Bethesda, MD: National Association of School Psychologists.

Reschly, A.L. & Christenson, S.L. (2006b). Prediction of dropout among students with mild disabilities: A case for the inclusion of student engagement variables. *Remedial and Special Education, 27, 276-292.*

Reschly, A.L., & Christenson, S.L. (2012). Jingle, jangle, and conceptual haziness: Evolution and future directions of the engagement construct. *The Handbook of Research on Student Engagement*.

Reschly, A.L., Pohl, A., Christenson, S.L., & Appleton, J.J. (2017). Engaging adolescents in secondary schools. In B. Schultz, J. Harrison, and S. Evans (Eds.). *School mental health services for adolescents*. Oxford University Press, New York.

Rimm-Kaufman, S.E., Pianta, R.C., & Cox, M.J. (2000). Teachers' judgments of problems in the transition to kindergarten. *Early Childhood Research Quarterly, 15*(2), 147-166.

Reynolds, C.R., & Richmond, B.O. (2008). *Revised Children's Manifest Anxiety Scale, Second Edition (RCMAS-2).* Los Angeles, CA: Western Psychological Services.

Rumberger, R.W. (1987). High school dropouts: A review of issues and evidence. *Review of Educational Research, 57,* 101-121.

Rumberger, R.W. (2011). *Dropping out: why students drop out of high school and what can be done about it*. Cambridge, MA: Harvard University Press.

Rumberger, R., & Lim, S. (2008). *Why students drop out of school: A review of 25 years of research*. Retrieved from: http://inpathways.net/researchreport15.pdf

Rumberger, R., & Rotermund, S. (2012). The Relationship between Engagement and High School Dropout. *The Handbook of Research on Student Engagement*.

Stormont, M., Beckner, R., Mitchell, B., & Richter, M. (2005). Supporting successful transition to kindergarten: general challenges and specific implications for students with problem behavior. *Psychology in the Schools, 42*(8), 765-778.

Sum, A., Khatiwada, I., McLaughlin, J., & Palma, S. (2011). No Country for Young Men: Deteriorating Labor Market Prospects for Low-Skilled Men in the United States. *Annals of the American Academy of Political & Social Science*, 635(1), 24-55.

Waldrop, D., Reschly, A., Fraysier, K., Appleton, J. (2016). An examination of the psychometric properties of the Student Engagement Instrument – College Version. Manuscript submitted for publication.

Wehlage, G.G., Rutter, R.A., Smith, G.A., Lesko, N., & Fernandez, R.R. (1989). *Reducing the risk: Schools as communities of support*. Philadelphia: Falmer Press.