AN EXAMINATION OF THE RELATIONSHIP AMONG AFFECTIVE, COGNITIVE, BEHAVIORAL, AND ACADEMIC FACTORS OF STUDENT ENGAGEMENT OF 9th GRADE STUDENTS

by

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Dr. Edward J. Kame'enui

Research has identified the construct of student engagement as an antecedent to positive academic outcomes. In this study, the Student Engagement Instrument (SEI) was administered to 371 9th grade students at a comprehensive high school to measure the cognitive and affective engagement of students. Exploratory factor analyses were conducted on the 35-item SEI with best model fit matching previous research in which a five-factor model was found. Logistic and multiple regression analyses were then utilized to explore the relationships among cognitive and affective engagement and student achievement and behavioral outcomes. Findings generally supported the significance of the student engagement subtypes of cognitive and affective engagement in predicting educational outcomes. Results suggest that further study of the affective and cognitive

subtypes and their development over the course of a student's education would enhance the understanding of the student engagement construct and lead to the development of interventions to mediate the effects of these subtypes.

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I dedicate this project to my family, without whom this would not be.

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CHAPTER I

INTRODUCTION

The construct of student engagement has been identified as a key component in understanding secondary students' complex psychological relationship with school (Fredericks, Blumenfeld, & Paris, 2004).The scholastic engagement of students is also considered a primary theoretical pathway to understand and respond to the thoughts, behaviors, and feelings that lead to high school dropout (Christenson, Reschly, Appleton, Berman, Spangers, & Varro, 2008; Finn, 1989). Yet, recent evidence demonstrates that students are becoming more disengaged from school, both socially and academically (Appleton, Christenson, & Furlong, 2008; Fredericks et al., 2004; National Research Council, 2004). The sharp decline in student engagement among high school students (Fredricks & Eccles, 2002) suggests that individuals' cognitive, behavioral, and emotional states put them at higher risk of dropping out without acquiring the basic skills necessary to gain employment in the modern workplace (Furlong & Christenson, 2008; National Research Council, 2004). As a result, the study of student engagement has increased as researchers realize the potential of utilizing engagement-related strategies as a tool to promote enthusiasm for learning and school reform (National Research Council, 2004).

Conceptions of Student Engagement

Although student engagement has been cited as an important mediator of academic achievement, pro-social behavior, and educational persistence (Janosz,

Archambault, Morizot, & Pagani, 2008), conceptions of the construct of student engagement have varied. Researchers in the field of engagement have not reached a consensus on the definition and measurement of student engagement (Appleton et al., 2008; Sharkey, You, & Schnoebelen, 2008). For example, a review of the research over the last 25 years revealed that student engagement has been defined using at least eight different terms: (a) engagement; (b) engagement in schoolwork; (c) academic engagement; (d) school engagement; (e) student engagement; (f) student engagement in academic work; (g) student engagement with school; and (h) participation identification (Appleton et al., 2008). Furthermore, researchers using the same terms have differed in the use of these terms when referring to the student engagement construct, which has led to a range of definitions that has made cross-study comparisons challenging (Fredericks et al., 2004). Researchers who study student engagement continue to struggle in gaining agreement on the definitions and measures of the construct, as is apparent in recent reviews of the literature that reveal an increase in the use of terms related to student engagement (Appleton et al., 2008).

Commonalities. Despite the use of different terms and the varied operationalizations of these terms, some conceptualizations of engagement share common features (Jimerson, Campos, & Greif, 2003). For example, Appleton et al.'s (2008) meta-analysis found that all studies contained behavioral components, and most of these components had emotional or psychological dimensions. Some studies combined these components into singular constructs, although all three component dimensions were arguably present in the studies (Fredericks et al., 2004). The development of an engagement typology has pushed conceptions of engagement towards a multidimensional

meta-construct with multiple components (Anderson, Christenson, Sinclair, & Lehr, 2004; Guthrie & Wigfield, 2000), although components of the meta-construct have differed (Appleton et al., 2008). This typology has included two to four dimensions of student engagement (Appleton et al., 2008; Appleton, Christenson, Kim, & Reschly, 2006).

Evolution of Subtype Definitions

Behavioral engagement. Fredericks et al. (2004) identified three dimensions of engagement--behavioral, emotional, and cognitive--in the literature and addressed the multiple interpretations of each component. These researchers defined behavioral engagement as (a) "positive conduct, such as following the rules and adhering to classroom norms, as well as the absence of disruptive behaviors such as skipping school and getting in trouble," (b) "involvement in learning and academic tasks and includes behaviors such as effort, persistence, concentration, attention, asking questions, and contributing to class discussion," and (c) "participation in school-related activities such as athletics or school governance" (p. 62). A two-tiered conception of engagement comprised of basic behaviors (e.g. participation, attendance) and higher-level behaviors (e.g. effort to learn) is relatively common in the student engagement field (Glanville & Wildhagen, 2007).

Emotional engagement. Emotional engagement is typically represented as affective responses such as interest, excitement, stress, and attitude (Fredericks et al., 2004; Marks, 2000). Some conceptualizations have also tied emotional engagement to students' sense of belonging and identification with school. However, some researchers have argued that the components of belonging and value should be defined separately due

to confounding antecedents, such as family, educational context, and cultural influences (Finn, 1989; Finn, 1993; Glanville & Wildhagen, 2007). Emotional engagement has also been characterized as representing students' feelings about the people, policies, and practices of the school environment that include students' complex relationships to school (Yazzie-Mintz, 2007).

Cognitive engagement. The construct of cognitive engagement temporally follows the development of behavioral and emotional engagement (Appleton et al., 2008). Cognitive engagement has been defined as "self-regulation, relevance of schoolwork to future endeavors, value of learning, personal goals and autonomy" (Appleton et al., 2008, p.372). Furthermore, cognitive engagement has been expressed by "flexibility in problem solving, preference for hard work, and positive coping in the face of failure" (Fredericks et al., 2004, p.64), as well as the ability to use metacognitive skills to evaluate task requirements (Connell & Wellborn, 1991; Reschly, Huebner, Appleton, & Antaramian, 2008). The meta-analysis of Fredericks et al. (2004) found that cognitive engagement has been presented with numerous competing conceptions and definitions. For example, in Appleton et al.'s (2008) meta-analysis of the engagement construct and definitions, cognitive engagement was defined with wide variation in the 19 studies selected. Fredericks et al. (2004) found a split between literature that represented psychological investments in learning – concentrated focus despite distraction, and the study of cognition and strategic learning – represented by a student's effort exerted to meet and exceed requirements (Corno, 1993). Clearly, the research on student engagement needs to reach agreement on the definition and measurement of cognitive engagement to address the disparity between the psychological requirements of

investment in learning and the cognitive framework of strategic learning (Fredericks et al., 2004).

Development of Four-Subtype Taxonomy

Citing the need to "empirically and theoretically refine and clarify [the student engagement] construct" (p. 382), Appleton et al. (2006, 2008) attempted to incorporate essential components of the multi-dimensional construct of student engagement research into a taxonomy of student engagement. Figure 1 presents a graphic representation of the engagement construct posited by Appleton et al. (2006).

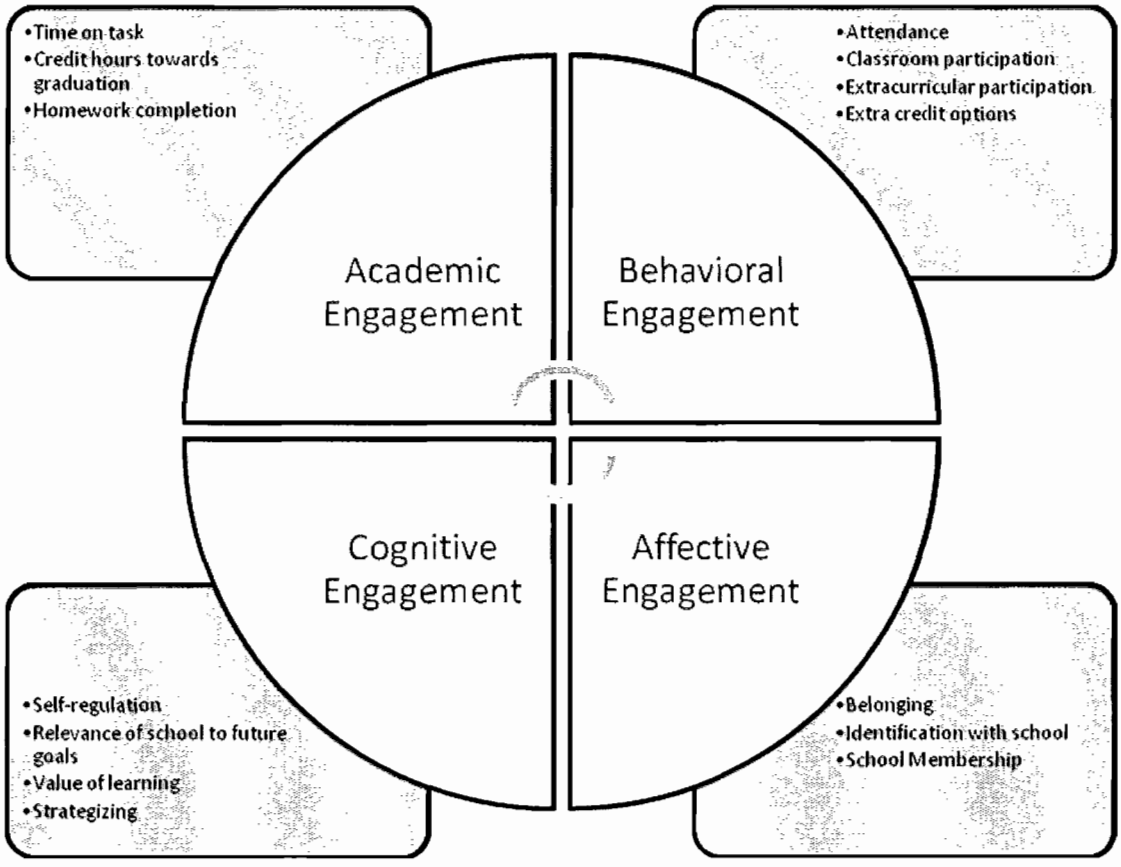

Figure 1. Four-part typology of student engagement. Adapted from Appleton et al. (2006, p. 430).

Appleton et. al.'s (2008) taxonomy of student engagement addresses both the absence of academic engagement as well as the definitional ambiguity of the constructs of behavioral, emotional, and cognitive engagement. The inclusion of academic engagement in the taxonomy is important, as time on task and work completion have been correlated with student achievement (Appleton et al., 2008; Fredericks et al., 2004).

Multidimensionality of the student engagement construct. Researchers have argued that the construct of student engagement must be viewed as a meta-construct in order to understand the interrelationship of the subtypes and their relationship with student dropout behavior (Appleton et al., 2008; Fredericks et al., 2004; Glanville & Wildhagen, 2007; Reschly et al., 2008). Viewing the subtypes of student engagement individually fails to address the "dynamically interrelated" (Fredericks et al., 2004, p. 61) nature of the cognitive, behavioral, and emotional experiences of students and oversimplifies a complex set of interactions. The study of student engagement as a multidimensional construct has the potential to reveal the interplay between subtypes of engagement and the school environment. Such a study should reveal the components important to the development of interventions to improve student engagement (Appleton et al., 2008; Archambault, Janosz, Fallu, & Pagani, 2009; Fredericks et al., 2004).

Cognitive and Affective Engagement

In order to refine the various conceptualizations of cognitive engagement in the literature, Appleton et al. (2006) defined cognitive engagement as (a) "self-regulation," (b) "relevance of schoolwork to future endeavors," (c) "value of learning," and (d) "personal goals and autonomy" (p. 429), which represented a narrowing of the extant definitions of the components (Fredericks et al., 2004; Jimerson et al., 2003). For

example, previous studies had constructed scale items for the cognitive engagement subtype retroactively from national datasets without a taxonomy of the engagement construct (Appleton et al., 2006). In addition, studies had conflated cognitive and behavioral engagement indicators to create weak subtype parameters (Fredericks et al., 2004). Affective engagement was defined as "feelings of identification or belonging, and relationships with teachers and peers" (Appleton et al., 2006, p. 429). These two components--cognitive and affective-- represented what Appleton et al. (2006) characterized as the "internal forms of engagement," (p.429) signifying a student's sense of connection to school and to the role of school in the student's future.

Links to student achievement. In the published research literature, investigators have reported strong relations between cognitive and affective engagement and school indicators of academic achievement (Appleton et al., 2006; Appleton et al., 2008; Archambault et al., 2009; Fan & Williams, 2009; Furlong & Christenson, 2008; Reschly et al., 2008). For example, in a study on school belonging, Goodenow (1993) found that psychological membership in school was linked to school motivation, academic achievement, and teacher-rated effort. In another study, Gutman and Midgley (2000) found that school belonging was significantly correlated with grade point average. This result was similar to the strong correlation that Goodenow and Grady (1993) found between school belonging and school motivation and subsequent academic achievement.

Research on cognitive engagement has also demonstrated significant correlations between student goals and self-efficacy and achievement (Appleton et al., 2008; Fredericks et al., 2004; Greene et al., 2004; Kortering & Braziel, 2008; McMahon et al., 2008). For example, in a study of high school students, Greene, Miller, Crowson, Duke,

& Akey (2004) noted that perceptions of current class work which they found as being instrumental to success were significantly associated with academic achievement. Furthermore, indicators of self-efficacy were positively correlated with grades and adaptive student motivation (Greene et al., 2004). These indicators of self-efficacy were also positively related to instructional interventions (Furlong & Christenson, 2008; Marks, 2000).

Research on student engagement has increased as the construct has continued to be linked to student academic outcomes and graduation rates (Reschly et al., 2008). Finn (1989, 1993) highlighted the separation between a student's demographic or historical characteristics and behavioral risk factors such as participation or engagement that reduce the likelihood of graduation and school success. Demographic factors include elements of students' family or personal backgrounds that impact the students' success in school and are unalterable, while behavioral risks were comprised of a set of behaviors that reduced the likelihood that successful school outcomes would be realized (Finn, 1993). This identification of alterable risk variables related to dropout provided a framework for the development of interventions to address specific student needs (Finn, 1993; Reschly et al., 2008).

Links to dropout. Research has defined high school dropout as the cumulating event of a "confluence of individual, social, family, cultural, socioeconomic, and institutional factors" (Janosz et al., 2008, p.22). The confluence has been tied together by the degree to which students are engaged with the academic environment (Appleton et al., 2008; Reschly & Christenson, 2006). For example, controlling for socioeconomic status, achievement test outcomes, and grade retention status, student engagement

measures predicted the dropout status for students with and without disabilities in a study utilizing data from the National Education Longitudinal Study (Reschly & Christenson, 2006; Sharkey et al., 2008). In a longitudinal study of French-Canadian high school students (N = 11,827), Archambault et al. (2008) found that behavioral, affective, and cognitive traits of engagement as measured in an 18-item self-report survey predicted school dropout. In addition, Archambault et al. (2009) surveyed 69 high schools in Quebec (N = 13,330) in a cross-sectional study of affective, cognitive, and behavioral dimensions of student engagement. Results of growth mixture modeling analyses provided support for the significance of cognitive and affective engagement in predicting dropout status. Furthermore, student engagement research has predicted high school dropout based on student engagement measures in elementary school (Alexander et al., 1997; Reschly & Christenson, 2006). Students of color are particularly susceptible to dropout, with graduation rates and measures of student engagement well below their white counterparts (National Research Council, 2004; Yazzie-Mintz, 2007).

While student engagement and its effect on high school dropout have historically been conceptualized in the literature as being difficult to change (Doll & Hess, 2001), recent studies have begun to identify alterable influences that enable the development of interventions that respond to students' gradual disengagement from school (Appleton et al., 2008). Furlong and Christenson (2008) drew the distinction between contextual factors that were *indicators* of engagement and those that were *facilitators* of engagement. Indicators of engagement, such as schoolwork completion, attendance, and grades, measure a student's connection with learning and provide information to identify disengagement. In contrast, facilitators of engagement, including parental supervision of

homework completion, school discipline systems, and student investment in learning, represent factors that are amenable to intervention (Appleton et al., 2008; Christenson & Thurlow, 2004; Furlong & Christenson, 2008).

Measurement of cognitive and affective engagement. The high degree of inference required to measure the internal forms of cognitive and affective engagement has resulted in fewer studies on these subtypes of student engagement. However, the studies that have been conducted demonstrate a positive relationship between cognitive and affective engagement and student achievement (Appleton et al., 2006; Reschly & Christenson, 2006). As noted elsewhere (Appleton et al., 2008; Kortering & Braziel, 2008; National Research Council, 2004; Reschly & Christenson, 2006), further research is required to reveal the underlying cognitive and affective indicators of student engagement that may be more elusive to measurement and intervention than the academic and behavioral engagement subtypes. Difficulties in measuring and conceptualizing cognitive and affective engagement have led to the haphazard development of research on student engagement and have made comparisons among studies challenging.

In order to address the disparate approaches to the measurement of cognitive and affective engagement, more research needs to pursue valid measures of cognitive and affective engagement that employ self-report measures as opposed to inferred, objective measures (Appleton et al., 2006; Kortering & Braziel, 2008). Substantial evidence exists that student self-report is a valid and reliable methodology (Assor & Connell, 1992; Carini, Kuh, & Klein, 2006; Pace, 1984). Furthermore, Fredericks et al. (2004) cited the limitations of utilizing observation to assess cognition and the "deep-level learning strategies" (p. 68) that reveal cognitive and affective engagement, and suggested that

researchers work to develop self-report surveys to assess engagement. Some researchers argue that self-report may be more reliable than inferred measures as a result of the nature of the subtypes of cognitive and affective engagement and their measure of student experiences, perceptions, and beliefs (Appleton et al., 2006; Fredericks et al., 2004; Johnson, 2008). Although self-report measurement does not allow for cross-informant perspectives (Sharkey et al., 2008), it does control for the tendency for observers to infer student thought and feeling (Johnson, 2008).

Study Purpose

The purpose of this study is to assess the cognitive and affective engagement of a sample of high school freshmen and to examine the relationship among self-reported cognitive and affective engagement and various academic and behavioral outcomes. Few instruments have been developed to measure cognitive and affective engagement (Appleton et al., 2006; Appleton et al., 2008; Betts et al., 2009). This study utilizes the Student Engagement Instrument (SEI), a self-report survey of cognitive and affective engagement, as a means to explore the relationship among all four subtypes of the student engagement construct. This study addresses the predictive strength of a five-factor model of cognitive and affective engagement based on the SEI. In addition, this study addresses the relative strength of each factor in predicting educational outcomes.

CHAPTER II

LITERATURE REVIEW

Appleton et al. (2006) cited the absence of "theoretically sound and empirically-based measures of cognitive and affective engagement" (p. 431) as the main limitation to the development of a research base from which to develop an understanding of the multi-dimensional construct of student engagement. Because of a perceived overemphasis in the student engagement literature on indicators of behavioral and academic engagement (Appleton et al. 2006), the development of instrumentation to accurately measure the student perspective has been limited (Appleton et al., 2008; Furlong & Christenson, 2008). To this end, the Student Engagement Instrument (SEI) was developed to provide valid data on cognitive and affective engagement by assessing a students' perception and experience with the educational setting (Appleton et al. 2006; Betts et al., 2009; Reschly et al., 2008).

Measuring Cognitive and Psychological Engagement: Validation of the Student Engagement Instrument (Appleton et al., 2006)

Appleton et al. (2006) utilized existing research to develop a survey instrument to measure cognitive and affective engagement. Drawing on the divergent approaches to the conceptualization and measurement of the construct, Appleton and colleagues (2006) attempted to examine the construct of student engagement by establishing a rationale and an empirical basis for the creation of four construct subtypes: academic, behavioral, cognitive, and affective engagement.

Rationale of the study. The taxonomy proposed by Appleton et al. (2006) argued for the existence of multiple indicators of student engagement associated with each of the four subtypes. These indicators are considered to be representative of essential contexts of learning (e.g., value of learning, support from family members). This taxonomy placed equal importance on the less observable indicators that make up cognitive engagement (e.g., self-regulation, relevance of schoolwork to future endeavors, value of learning, and personal goals and autonomy) and affective engagement (e.g., feelings of identification or belonging, relationships with teachers and peers), which have been linked to improved school performance . For example, it appears that a strong relationship exists between cognitive engagement and personal goal orientation and investment in learning, which in turn is positively associated with academic achievement (Greene & Miller, 1996; Greene et al., 2004; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996; as cited in Appleton et al., 2006; Pokay & Blumenfeld, 1990). Likewise, adaptive school behaviors such as participation and attendance have revealed strong associations with affective engagement (Goodenow, 1993; as cited in Appleton et al., 2006).

Furthermore, Appleton et al. (2006) cited a growing body of literature that demonstrated that indicators of cognitive and affective engagement are: (a) associated with increased learning outcomes, (b) related to motivation, and (c) responsive to targeted teaching strategies (Fredericks et al., 2004; Marks, 2000; National Research Council & Institute of Medicine, 2004; Reeve, Jang, Carrell, Jeon, & Barch, 2004). Appleton et al. (2006) posited that the understudied subtypes of cognitive and affective engagement provided a more complete understanding of student engagement. These researchers cited

research in which students who felt more connected to staff, autonomously engaged in positive school-related behaviors (Ryan, Stiller, & Lynch, 1994).

Appleton et al. (2006) argued that the limitations in measuring cognitive and affective engagement have led to a dearth of research and difficulties in establishing comparisons of the subtypes across studies. Historically, many studies have established subtypes retroactively, which has arguably led to weak conceptual frameworks, according to Appleton et al. (2006). Additionally, Appleton et al. (2006) criticized previous studies that grouped subtypes together into an "amalgamation" (p.430) that failed to provide clarity to the construct. The selection of participants in engagement studies was also criticized.

According to Appleton et al. (2006), these limitations led to an overemphasis on the more easily measured indicators of academic and behavioral engagement, which were unable to measure a student's experience and the impact of the environment on student engagement. Appleton et al. (2006) contended that the measurement of cognitive and affective engagement from the student perspective would result in a more valid understanding of student experience and meaning. Citing empirical studies on the validity of self-report measures (Connell & Wellborn, 1991; Finn, 1989), Appleton et al. (2006) concluded that the measurement of students' perspectives on their own experiences, perceptions, and beliefs about education was necessary to understand the complete construct of student engagement. The purpose of the work of Appleton et al. (2006) was the development and validation of a psychometrically sound instrument designed to measure students' cognitive and engagement from the student perspective.

Methodology. Appleton et al. (2006) conducted the first research study on the Student Engagement Instrument (SEI) with 1,931 9th graders in a diverse, urban Midwestern school district. The research division of the school district randomly selected 2,577 students from the 9th grade class ($N = 3104$), 75% ($N = 1940$) to complete the survey.

The sample was 40.4% African American, 35.1% White, 10.8% Asian, 10.3% Hispanic, and 3.5% American Indian. Twenty-three percent of respondents came from homes in which languages other than English were spoken, 61.4% were eligible for a free or reduced priced lunch, and 7.6% were received special education services. Chi-square tests to examine differences between respondents and non-respondents found that significant differences existed between students selected to take the SEI and those students that completed the survey only on the free or reduced lunch variable ($V^2=.156$, $p < .001$), which ostensibly serves as a proxy for SES and warrants attention.

The SEI was developed from reviews of literature on student engagement, and was designed to measure the cognitive and affective subtypes of engagement. The SEI was developed by documenting the varied conceptualizations of cognitive and affective engagement present in the literature through a search of archival databases and selected journal articles. A search of the terms (a) engagement, (b) belonging, (c) identification with school, (d) self regulation, (e) academic engagement, (f) behavioral engagement, (g) cognitive engagement, and (h) affective engagement identified several pre-existing engagement scales. Using this work as a basis, probes and items were used to create a preliminary scale. The SEI contained three subscales of cognitive engagement (i.e., Control and Relevance of School Work, Extrinsic Motivation, and Future Aspirations and

Goals) along with three subscales of affective engagement (i.e., Family Support for Learning, Peer Support for Learning, and Teacher-Student Relationships).

An initial pilot of 31 8th graders examined the initial scale in two groups and provided feedback that led to structural and semantic changes to the items and increased the clarity and relevance of the instrument. The complete version of the SEI contained 30 items designed to measure student cognitive engagement and 26 items designed to measure affective engagement. A four-point Likert scale was utilized (1=strongly agree, 2=agree, 3=disagree, and 4=strongly disagree). Student demographics, including gender, ethnicity, free or reduced lunch status, special education status, documented suspensions, and scores on the Northwest Achievement Levels Test were obtained from the district.

Passive consent was used in the administration of the SEI to increase student participation in the research and thus, provided greater variation of student perspective. Reverse-keying of six items within the study to reduce acquiescence response and monitoring of students were employed to dissuade careless responding. To avoid confounds with reading ability deficiencies, the SEI was administered orally. Surveys were inspected for missing data and any SEIs with five or more data points were reviewed. Responses with more than one answer were coded as missing, and no evidence of systematic responses for missing responses was found.

Results. Polychoric correlations were computed to define item associations. Factor analyses were conducted using principal axis factoring to extract factors, utilizing half the dataset. Confirmatory factor analyses (CFAs) were used to determine model fit for plausible factor models with the other half of the dataset. The Chi-square test, the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the root mean square

error of approximation (RMSEA) were used to address limitations within each index and to provide a comprehensive examination of the SEI.

Findings from exploratory methods revealed support for conceptualizations of factors that underlie cognitive and affective engagement. Polychoric correlations of the first half of the dataset and principal axis factoring were used to determine a model of between four and six factors. Further exploratory factor analyses (EFAs) of the four, five, and six-factor models were conducted with items loaded onto cognitive or affective engagement subtypes. The six-factor model included items associated with extrinsic motivation.

CFAs were conducted on the other half of the dataset, producing χ^2/df ratios for the five- and six-factor models that indicated acceptable model fit (the four-factor model did not fit the data) with all of the model fit indices (CFI, TLI, RMSEA, Chi-Square, χ^2/df , and Dv2). Change statistics comparing the fit between the five- and six-factor models revealed the importance of the sixth factor, with Chi-Square difference test results that were significant ($\Delta\chi^2 = .203.71$, $df = 60$, $p < .001$).

The convergent and discriminant validity of the six-factor structure were supported based on the relationships between the cognitive and affective factors. The factors --Student-Teacher Relationships, Peer Support for Learning, Future Aspirations and Goals, Family Support for Learning, and Extrinsic Motivation and school indicators--evinced correlational relationships that were in the expected positive (e.g., GPA) and negative (e.g., absences) directions.

Variance attributed to cognitive and affective subtypes was unique to each factor, and positive inter-correlations suggested that each factor measured a different aspect of

cognitive and affective engagement. Findings substantiated previous research that reported positive peer relationships were more affected by intrinsic, as opposed to extrinsic, motivation. Most SEI factors exhibited positive relationships in expected directions with school indicators. The control/relevance factor correlated negatively with math/reading scores and GPA, which could have been a result of the perceived irrelevance that students' arguably harbor about work that does not connect to long-term goals, or the perceived lack of benefit of achievement on a state examination.

Implications. Appleton et al. (2006) suggested that future research needs to obtain data from a cross-section of social and ethnic groups to aid in the generalizability of the SEI. In addition, the authors noted that relation of cognitive and affective engagement to academic and behavioral engagement required further examination to reveal the degree of relationship among the constructs. Finally, they suggested that further research was warranted to investigate whether specific (academic, behavioral) or general (cognitive, psychological) forms of engagement are more responsible for important outcomes. In addition, Appleton et al. (2006) recommended further study of the interaction between the specific and general forms of engagement to assess the interrelationship of the entire construct of student engagement.

Engagement as Flourishing: The Contribution of Positive Emotions and Coping to Adolescents' Engagement at School and with Learning (Reschly et al., 2008)

Rationale of the study. Building upon the work of Appleton et al. (2006) and the initial validity study of the SEI, Reschly et al. (2008) utilized the SEI in a study of the relationship of positive emotions and coping mechanisms to student engagement in school. The authors argued that positive emotions were central to the process of

expanding human thought and behavior that led to greater adaptability and heightened learning opportunities (Fredrickson, 2001; as cited in Reschly et al., 2008). Frederickson's (1998, 2001) "broaden and build theory," which was the basis of this study, posited that the accrual of frequent positive emotions builds emotional resources that create an upward spiral toward well-being. Reschly et al. (2008) hypothesized that positive emotions produced future as well as present well-being, and enabled individuals to build resources that strengthened responses to challenges. In contrast to the narrowing of thought and behavior during frequent negative emotions, positive emotions were linked to flourishing adaptive responses.

Examinations of the research literature provided support for the role of positive emotions in broadening "attention, cognition, and behavior, as well as build[ing] physical, intellectual, and social resources" (Reschly et al., 2008, p. 19). Further evidence linked positive emotions to success across life activities, such as marriage, work success, friendship, and physical health (Lyubomirsky, King, & Diener, 2005). Reschly et al. (2008) hypothesized that the broadening of positive emotions and their effect on resiliency were linked to greater coping resources (Frederickson, 2001; Frederickson & Joiner, 2002). These positive emotions were purported to improve broad-minded coping, which has been defined as the broadening of one's thinking and heightened ability to cope with challenges due to exposure of positive emotions . Coping and positive emotions were posited to interact reciprocally, spiraling toward well-being (Frederickson, 2001). In a similar process, student engagement and supportive learning contexts were hypothesized to interact reciprocally, moving towards a cyclical increase in the perception of support and student engagement.

The broaden and build theory had been utilized in research with adults, yet few studies had examined adolescents in educational contexts. Gaps in the research of the broaden and build theory were addressed by reviewing existing literature and focusing on the measurement of affect, coping, and student engagement as they relate to educational contexts. Reschly et al. (2008) tested the broaden and build theory by building hypotheses from previous research that predicted that (a) affect would relate to student engagement, (b) broad-minded coping would be positively linked to student engagement, (c) positive but not negative affect would be linked to coping strategies, and (d) positive affect and engagement would be mediated by broad-minded coping.

Methodology. A review of the research led Reschly et al. (2008) to include demographic variables that had evinced strong relationships with the variables linked to positive emotions and affective and cognitive engagement. Three demographic variables were included in the study: grade level, gender, and socioeconomic status (SES). Citing research on gender and engagement (Furrer & Skinner, 2003; Goodenow, 1993; Marks, 2000), Reschly et al. (2008) argued that the relationship between relatedness and engagement is stronger for boys, while girls have been found to be more engaged academically even when accounting for engagement variables. SES was chosen over racial/ethnic group membership because previous research had found that engagement variables were strong predictors within groups of students based on demographic/risk factors (Finn & Rock, 1997).

Reschly et al. (2008) administered the three measures of positive emotions and coping as part of a 3-year longitudinal study, which utilized active consent. The sample was comprised of 293 students (178 females, 115 males) from grade 7 (N = 4), grade 8

(N = 110), grade 9 (N = 87), and grade 10 (N = 92) in the rural southeastern United States. The sample was 47.8% Caucasian, 41.2% African American, 2.4% Asian/Indian, 1.0% Hispanic, and 5.2% Other. Nearly half of all students in the sample (47.8%) indicated that they received free and reduced lunch.

Reschly et al.'s (2008) study utilized three measures: the (a) Positive and Negative Affect Schedule-Children (PANAS-C), (b) the Self-Report Coping Scale (SRCS), and (c) the Student Engagement Instrument (SEI). The PANAS-C is a 27-item survey with 12 items on a Positive Affect (PA) subscale (frequency of emotions such as excited, cheerful, energetic, etc.) and 15 items on an Negative Affect (NA) subscale (frequency of emotions such as sad, nervous, ashamed, etc.). Reschly et al. (2008) cited prior studies that found both subscales exhibited strong internal consistency.

The SRCS is a 34-item scale that measures five coping strategies (Causey & Dubow, 1992), although two subscales were used within this study: Seeking Social Support (8 items) and Self-Reliance/Problem Solving (8 items). The authors stated that the SRCS had adequate internal consistency reliability (0.68 – 0.94), and adequate reliability and validity based on the study of Causey and Dubow (1992). Causey and Dubow (1992) found that these two subscales were correlated with positive coping behaviors and strong self-esteem.

Results. Reschly et al. (2008) computed descriptive statistics and correlations, and conducted regression analyses using the study variables. Descriptive analyses from affect scores indicated that people reported more positive than negative emotions. Problem-solving and social support coping strategies were both used moderately, while

mean scores for Future Aspirations and Goals and Family Support for Learning were high.

Correlational analyses uncovered a positive relationship between gender and two other subtypes--peer and family support for learning and seeking social support. A negative association was found between grade level and positive affect (PA) and the engagement subscales, although a positive correlation was discovered between PA and the engagement subscales and PA and coping strategies. The two coping scales were strongly correlated with the engagement measures.

The role of seeking social support in the mediation of positive affect and engagement was investigated through regression analyses. Results indicated that seeking social support exhibited significant meditational effects on teacher-student relationships, control and relevance, peer support, and family support. This effect was further demonstrated by the decrease in the correlations among these four engagement measures and positive affect. Additionally, the role of problem solving in the mediation of engagement was explored, and findings indicated meditational effects on Teacher-Student Relationships, Control and Relevance of Schoolwork, Future Aspirations and Goals, and Family Support for Learning.

Implications. Reschly et al. (2008) concluded that evidence from this study supported the hypothesis that frequent positive emotions in school are related to cognitive, behavioral, and coping strategies. These findings support the hypotheses of the broaden and build theory (Fredrickson, 1998) that positive emotions exhibit strong mediational relationships with student engagement and personal and environmental resources. The authors stressed the importance of these findings in providing support for

the mediation of alterable student engagement variables that are crucial factors to individual success. The malleability and responsiveness of positive emotions were cited as a means to developing intervention strategies aimed at increasing positive emotions that subsequently influence student engagement and coping strategies.

Research on the predictive qualities of positive emotions to future well-being was cited as a logical progression of this study. Additionally, further inquiry into the complex relationship between positive emotions and the two internal subtypes of engagement (cognitive, psychological) as they relate to the two external, overt subtypes (academic, behavioral) of engagement was suggested. Reschly et al. (2008) stressed the need to investigate individual differences in personality, ability, and interests to develop interventions that address unique personal and environmental resources.

The authors identified generalizability as a limitation of the study, with the SES and race/ethnicity of the sample as being non-representative of student populations nationwide. Furthermore, the decision to use active versus passive consent may have been a possible source of engagement bias, as students that do not return surveys could be those that are most disengaged with school. Finally, data were collected cross-sectionally, which may not have provided sufficient support for the broaden and build theory and its central focus on the development of positive emotions and greater personal and environmental resources.

A Study of the Reliability and Construct Validity of the School Engagement Instrument (SEI) across Multiple Grades (Betts et al., 2009)

Betts et al. (2009) furthered research on the reliability and validity of the SEI that Appleton et al. (2006) had initiated. Citing the potential of the instrument to measure the

alterable aspects of risks of dropping out and academic failure, the authors argued for centralizing research on student engagement on the measurement of cognitive and affective engagement. Yet, difficulties in the measurement of cognitive and affective engagement and broad conceptualizations of these subtypes have resulted in disparate approaches to the study of these traits of student engagement (Fredericks et al., 2004; as cited in Betts et al., 2009).

Rationale of the study. To provide more evidence for the efficacy of the SEI, Betts et al. (2009) extended the maturational level of respondents and utilized a broader sampling plan than Appleton et al. (2006). Additionally, the study built upon the construct validity for the SEI by (a) confirming the factor structure, (b) estimating scale reliabilities, and (c) measuring invariance of parameter estimates across grade levels.

Latent variable modeling was used in the investigation of the SEI. Participants (N = 2,416) in this study ranged from grades 6-12, with the intention of testing the internal construct validity of the initial study with samples below and above grade 9. Two school districts in South Carolina (N = 418) and Minnesota (N = 1,998) were sampled, with a relatively equal number of males (N = 1,197) to females (N = 1,219). The study sample was also 87% European American (N = 2,073), 9% African American (N = 220), 1% Asian American (N = 33), 1% Hispanic American (N = 29), 1% Native American (N = 19), and 1 % Other (N = 27).

Methodology. Betts et al. (2009) did not utilize the factor of extrinsic motivation from the six-factor SEI, as its two-item composition confounded measurement. The five-factor model contained the following aspects of student engagement: Teacher-Student Relationships (TSR), Control and Relevance of School Work (CRSW), Peer Support for

Learning (PSL), Future Aspirations and Goals (FG), and Family Support for Learning (FSL). The five- and six-factor models exhibited the same fit. Reviews of student engagement literature were used to create items utilizing student focus groups. The SEI contained 19 items measuring affective engagement and 16 items surveying cognitive engagement.

An analysis of the SEIs factorial structure was conducted. Exploratory factor analyses (EFAs) were conducted to identify factor-specific items. A series of Confirmatory Factor Analytic (CFA) models were then estimated. Model fit indices were used to make model comparisons, and factors were chosen using two stringent statistical criteria to address over- and under-extraction of factors—the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA). The model with a CFI of .95 or higher and an RMSEA at or below .05 was chosen, providing it contained the lowest number of factors.

The indicator variables' patterns of loadings on the latent factors were analyzed using Hoyle and Duvall's (2004) methodology. The Wald test was used to place restrictions on the model, and a baseline for significance was set between the hypothesized value and parameter estimate. Item indicator salience of .30 was set as a minimum level and items with significant loadings on factors below this minimum were set to zero.

The reliability of the scales was computed utilizing the composite reliability for congeneric measures model (CRCMM, Raykov, 1997; as cited in Betts et al., 2009), which estimated true reliability of sample scales. A multiple group confirmatory factor analysis with nested models was used (Joreskog, 1971; Bollen, 1989; as cited in Betts et

al., 2009). Finally, model fit statistics were used to measure evidence of invariance across grades.

Results. Both four- and five-factor models were found to be good fitting, although only the five-factor model met CFI and RMSEA criteria. All models had statistically significant Chi square tests. The similarity between indicator items and the number of factor grades in model fit indices suggested a good model fit. Results from covariance matrices and unstandardized factor loadings indicated measurement invariance across the sample.

Betts et al. (2009) removed the sixth factor from the analysis. Reservations regarding the fit of a six-factor model had been noted (Appleton et al., 2006), as the wording of the two items of the sixth factor that gauged extrinsic motivation were reverse-coded, and measured the extent to which students were not extrinsically motivated (Appleton et al., 2008). Although these two items exhibited a high reliability coefficient (Appleton et al., 2006; Betts et al., 2009), it appeared difficult to examine the extent to which the coefficient was affected by the negative wording of the items. Furthermore, there was a strong similarity of fit between the 5- and 6-factor models (Betts et al., 2009). Betts et al. (2009) suggested that subsequent studies of the SEI utilize a five-factor model representing cognitive and affective engagement.

Betts et al. (2009) found that all factors were correlated ($r = .45 - .79$). The five-factor model replicated the intended factor structure and indicators exhibited significant relationships with intended factors. In contrast to previous research, a single item with significant cross-loading was discovered, as well as a more complex error structure. Six pairs of indicator variables contained correlated residuals, which provided evidence for

possible construct irrelevant factors. Betts et al. (2009) suggested that correlated errors may have been a product of this sample and stressed the need for further replication of the study.

Implications. Findings indicated replication of the intended factor structure, and provided data to suggest that the SEI measured both cognitive and affective factors across maturational levels in grades 6-12 with similar reliability. The authors cited the potential of the SEI to be used as an instrument to focus interventions and address the aspects of cognitive and affective engagement that are ostensibly linked to dropout. Correlated residuals were identified with six pairs of items (1 & 5; 10 & 12; 11& 13; 14 & 15; 22 & 24; 25 & 26), which suggested the possibility of "mini-factors" (Betts et al., 2009, p. 14) that may be more relevant items within each factor.

The authors cited limitations that need to be addressed in future studies of cognitive and affective student engagement. Betts et al. (2009) suggested that more work needs to address equivalent measurement across demographic variables such as ethnicity and special education. Furthermore, tests of the convergent and divergent validity of the SEI with hypothesized constructs and relationships should be established. Further research should also include an investigation of the item pool and the deletion of pairs with correlated residuals from the scale along with the computation of scale reliabilities.

Research Questions

The purpose of this study was to build upon the work of Appleton et al. (2006), Reschly et al. (2008), and Betts et al. (2009) and examine the relationship among cognitive and affective engagement and student academic and behavioral outcomes as measured by the SEI with a cohort of 9th grade students. Specifically, this study

addressed the following questions: Controlling for demographic and risk variables, what is the direction and strength of the relationship between measures of cognitive and affective engagement gathered from the SEI self-report measure and (1) student achievement outcomes as measured by 9th grade, first semester GPA, (2) number of behavioral discipline referrals, and (3) credit completion?

Hypotheses

This study investigated the following hypotheses utilizing self-report data from the SEI: (a) self-report data representing cognitive and affective engagement will have strong positive relations with student engagement academic outcome variables (grade point average and credit completion) measured at the end of the first semester for 9th grade students; and (b) behavioral discipline referrals will have significant negative association with scores on the SEI at the end of the first semester for 9th grade students.

CHAPTER III

METHODOLOGY

Setting and Participants

The Student Engagement Instrument (SEI) was administered in a school district in Oregon with a total population of 5,500 students. The district maintains one comprehensive high school, which resides in a suburban community with a predominately working class population. The ethnic makeup of the district is (a) 75 % Caucasian, (b) 14 % Hispanic, (c) 3 % Native American, (d) 3% Asian, (e) 3 % African American, (f) <1% Pacific Islander, and (g) 2% declined. The percentage of students on free and reduced lunch (FRL) status is reported as 34% district-wide. English language learners make up 3% (N = 180) of the student population, while 19% (N = 1092) of students receive special education services in the district.

The survey was administered to all 9th grade students (N = 413) at the only comprehensive high school in the school district. Ninety percent of the 9th grade students completed the survey (N = 371). The remaining students had either moved away or were absent on the day of administration. The sample was split almost evenly between male (N = 174) and female (N =197). The sample was (a) 80% Caucasian (N = 295), (b) 14% Hispanic (N = 52), (c) 3% American Indian/Alaskan Native (N = 10), (d) 2% African American (N = 7), (e) 2% Asian (N = 6), and (f) less than 1% Native Hawaiian/Pacific Islander (N = 1). The percentage of students identified as receiving free or reduced lunch (FRL) was 45% (N = 168). Students receiving English language development services

made up 1% (N = 4) of the sample, and 13% (N = 48) of the sample received special services.

Measure. The SEI (Appleton et al., 2006) is a scale that measures cognitive and affective engagement with school. It is comprised of 35 items and is administered orally through a self-report survey. Respondents provide degree of agreement on a four-point scale, from *Strongly Disagree* to *Strongly Agree*. The SEI measures five subscales of student engagement that represent cognitive (Control and Relevance of School Work (CRSW), Future Aspirations and Goals (FG)) and affective (Teacher-Student Relationships (TSR), Peer Support for Learning (PSL), Family Support for Learning (FSL)) engagement.

Findings from previous validity studies (Appleton et al., 2006; Betts et al., 2009) indicated strong model fit for all items, with similar reliability in measuring cognitive and affective factors across maturational levels. The internal consistency of the SEI factors has ranged from 0.72 to 0.88, and correlations in expected directions with demographic and academic variables support the instrument's validity (Appleton et al., 2006).

Predictor variables. Both demographic and district outcome data were utilized in the study. Demographic variables included Free-Reduced Lunch (FRL) status, gender, special education status, English language development status, and ethnicity. Each of the student demographic variables was dummy coded utilizing SPSS 16.0. The FRL variable ostensibly serves as a proxy for socioeconomic status. Ethnicity was dummy coded into a dichotomous variable with "white" coded as 0, and all other ethnic identifications coded as 1. Dummy codes were also used to identify free and reduced lunch recipients, special education students, and English language learners. These variables served as control

variables in the analyses. English language development status was dropped due to lack of variance in the sample.

Criterion measures (district variables). District outcome data included the following variables from the first semester of grade 9: (a) grade point average (GPA), (b) credit completion, (c) documented minor behavioral referrals, and (d) documented major behavioral referrals. Data were accessed through archival databases maintained by the Bethel School District, and student identifying information was removed to maintain confidentiality. Credit completion was a variable derived to track individual student progress towards graduation during the first 9th grade semester. In SPSS, a dichotomous dummy variable was computed, utilizing the two variables provided in the district dataset: "total credits attempted" and "total credits earned." Students with at least one failure were coded as 0, and students whose credits attempted matched credits earned were coded as 1. This variable provided data on how many students had failed at least one class in the first semester. Both credit completion and minor and major behavioral referrals were categorized as a result of the skewed distribution of the sample.

Behavioral referrals were identified as either minor or major referrals. Minor referrals included all behavioral infractions that did not result in a suspension, lunch detention, or Tuesday School, which is an alternative to suspension. Major referrals included those behavioral infractions that resulted in a suspension, lunch detention, or Tuesday School (alternative to suspension). Referral data was limited to the first semester of the 2009-2010 academic year, and did not include district K-8 behavioral data. Both minor and major behavioral referrals were dummy coded into dichotomous variables.

Students with no referrals were coded as 0, and students with one or more referrals were coded as 1.

SEI Administration Procedures

The school district's instruction department oversaw the administration and scoring of the SEI. The survey was group administered in classroom settings. Students marked their responses on a scanable bubble sheet. Social studies instructors were selected to administer the SEI in their classes, as all 9th grade students take the same social studies class. Students were given 45 minutes to complete the survey, and those students that were absent were not tested. The SEI was also administered orally to control for variation in reading ability among the students.

As noted in Reschly et al.'s (2008) study utilizing the SEI, active consent may create an engagement bias by excluding students from the survey that do not exhibit the engagement with school to turn in consent forms. Therefore, the administration of the survey occurred at regular class meeting times and was not announced to students prior to the assessment date. Students were instructed that the survey was voluntary and were given the opportunity to decline participation in the survey.

A script providing survey instructions was used in the administration of the survey and was read to students in each classroom. The purpose of the script was to instruct students to answer each item response and to respond honestly about each item. Students were instructed that survey data were anonymous and that they would not be identified by name. Random numbers generated by SPSS were assigned to each student. Surveys had a sheet of paper affixed to them with the student's name on it. Students tore

off and recycled this identification sheet, and were left with a survey that had a random generated number that identified them.

Missing Data

Median substitution was used to replace missing values on specific items that students failed to mark. As a result of the small proportion of students that provided missing data on the survey, data estimation techniques such a single/multiple imputation (Schafer & Graham, 2002) and listwise deletion were not utilized. In the entire survey administration, 30 item responses were not marked out of a total of 12,985 item responses, which equates to .2% of the responses collected. In SPSS, a frequency distribution was computed on each item. Item 31 had the highest number of missing values, with 4 missing values out of 371 total values on the item (1%).

Median substitution was performed using SPSS to replace the missing values of each variable with the median of all values in that variable. A new variable was computed for each of the 35 items on the SEI, and all missing values were replaced with the series median of valid surrounding values, rather than the series mean. The series median was chosen as a result of the ordinal Likert items on the SEI and the skewed distribution of the data. The span of nearby points was set to "all."

Data Analysis

Exploratory factor analysis. An exploratory factor analysis (EFA) was used to examine the shared variance among items and explore the underlying factor structure of the SEI. The EFA was estimated using principal axis factoring with a promax oblique rotation. An oblique rotation was used in the estimation as it was expected that the hypothesized dimensions or factors describing the structure would be intercorrelated.

Items that loaded less than .275 and items that cross loaded with other items were removed from the analysis. The level of .275 was selected as a minimum level for item indicator salience. To test the hypothesis of a five-factor model of the SEI (Appleton et al., 2006; Betts et al., 2009; Reschly et al., 2008), the EFA was restricted to five factors.

Supplemental analyses. Reliability coefficients were computed on each factor to evaluate the consistency of student responses on the cognitive and affective engagement scales. Correlation coefficients were also computed to index the bivariate relationships between variables.

Regression analyses. Sequential logistic and multiple regression analyses were used to assess the relations between measures of cognitive and affective engagement on the SEI and student academic and behavioral outcome measures. A sequential multiple regression analysis was used to examine relationships with GPA, the one continuous outcome variable in the study. Sequential logistic regression analyses were used to examine relationships with the three dichotomous outcome variables (credit completion, minor behavioral referral, and major behavior referral).

In the first step of each analysis, all five control variables (FRL status, gender, special education status, English language development status, and ethnicity) were added to the model to control for the effects of demographic and risk factor variables. The English language development status variable was later removed from the analysis as a result of the absence of English language learners on the day of administration. In the second step of the analysis, cognitive and affective engagement factors, as measured by the SEI, were added to determine if student SEI responses independently added to the explanation of academic achievement and behavioral outcomes. These factors included

Teacher-Student Relationships (TSR), Control and Relevance of Schoolwork (C/R), Peer Support at School (PEER), Future Aspirations and Goals (ASP), and Family Support for Learning (Family). A separate regression analysis was performed for each outcome variable. The percent of variance associated with cognitive and affective engagement factors was used to represent the unique relationship between the set of predictors and each outcome variable.

CHAPTER IV

RESULTS

Descriptive Statistics

Table 4.1 presents descriptive statistics on each of the outcome variables. For the dichotomous outcomes, the mean represents the proportion of the sample with a particular type of referral or a class failure. Overall, 66% of the sample passed all of their classes. However, 15% of the sample received a minor behavioral referral while 13% received a major behavioral referral. The mean GPA was 2.609, indicating an average grade of B-. However, GPAs ranged from 0 to 4.0 with a standard deviation of 1.169.

Table 4.1
Descriptive Statistics for the Sample of 9th Grade Students (N = 371)

	Mean	Standard Deviation
GPA	2.609	1.169
Credit Completion[1]	0.666	
Minor Behavioral Referrals[1]	0.150	
Major Behavioral Referrals[1]	0.130	

[1]For the dichotomous outcomes, the mean represents the proportion of the sample with referrals or failures (e.g. 13% of the sample had a major behavioral referral).

Exploratory Factor Analysis

The exploratory factor analysis was performed using SPSS 16 for Windows. Eigenvalues, scree plots, and factor loading patterns were used to determine the number

of factors to retain. Using Kaiser's rule, the analysis extracted eight factors accounting for 49.6% of the variance of the 35 items. Post-extraction item communalities were moderate to high, ranging from .295 to .799. Item 10 showed the lowest communality (h^2 = .230). Because the item fit well in a later interpretation, however, it was retained in the analysis.

Inspection of the pattern matrix revealed moderate to high loadings for items on their respective factors. The pattern of factor loadings suggested that six of the eight extracted factors were uniquely defined. However, the sixth factor, labeled Extrinsic Motivation in previous studies of the SEI and associated items, was not retained. Both items 18 and 32 were reverse-coded, with students responding to the extent that they were *not* engaged. Previous studies revealed difficulty in determining the extent to which the coefficient was affected by the negative wording of these items (Appleton et al., 2006; Betts et al., 2009). In addition, there is a strong similarity of fit between the five- and six-factor models (Betts et al., 2009). Furthermore, items 18 and 32, which represented Extrinsic Motivation, are not subsumed under other factors (Appleton, February 10, 2010: personal correspondence). Therefore, the EFA was rerun with items 18 and 32 excluded.

Five factors were extracted from the EFA after the removal of items 18 and 32. Consistent with previous studies of the SEI (Appleton et al., 2006; Betts et al., 2009), the identified factors were labeled as follows: 1) Teacher-Student Relationships (TSR), 2) Future Aspirations and Goals (ASP), 3) Peer Support at School (PEER), 4) Family Support for Learning (Family), and 5) Control and Relevance of Schoolwork (C/R). Visual inspection of the scree plot also confirmed that a five-factor model was

appropriate. Figure 2 illustrates the scree plot elbow, which conforms to results predicted using eigenvalues of a five-factor model.

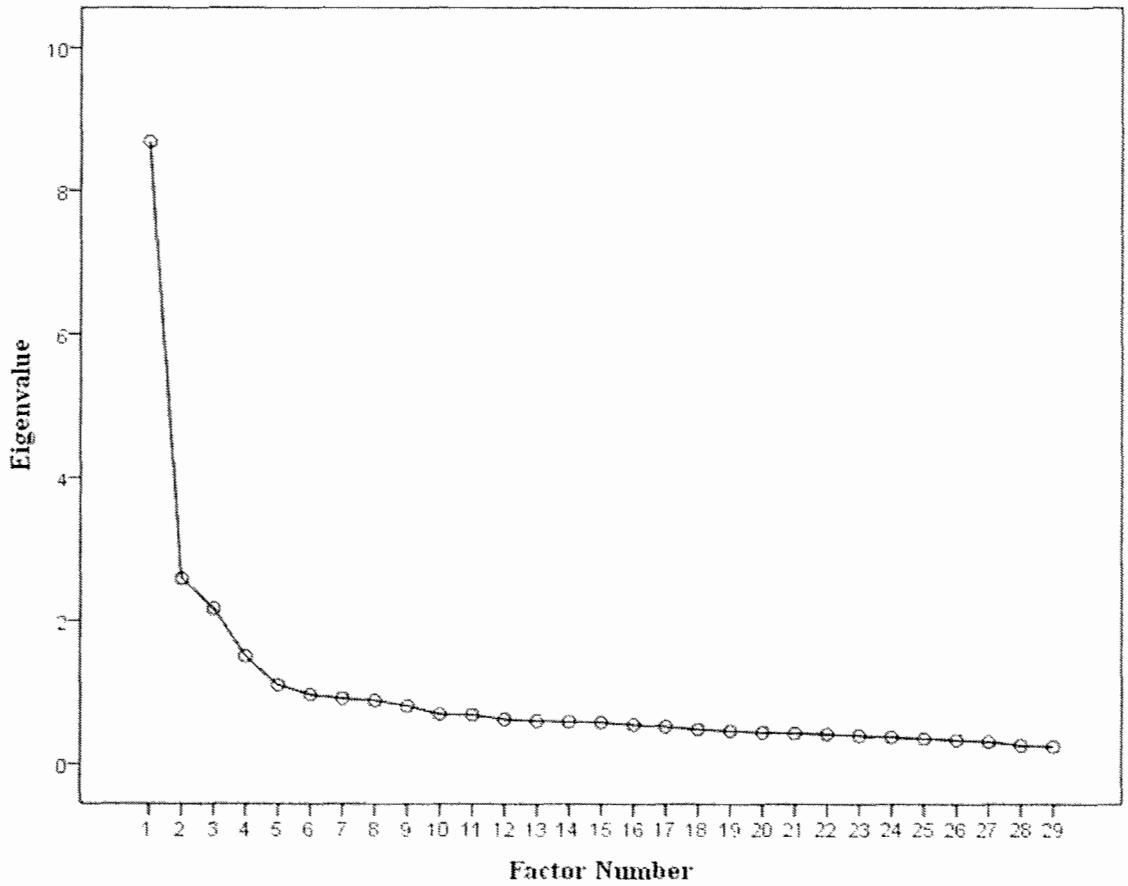

Figure 2. Scree plot of Student Engagement Instrument exploratory factor analysis loading onto five factors

The first factor, Teacher-Student Relationships, contained 8 items (3, 5, 10, 13, 16, 21, 22, 31) and accounted for 27.84% of the variance. Items loading on this factor were representative of traits of affective engagement and a student's psychological connection to teachers. The second factor, Future Aspirations and Goals, contained 5 items (8, 11, 17, 19, 30), and accounted for 7.06% of the variance. These items represented cognitive engagement. The third factor, Peer Support at School, contained 6 items (4, 6, 7, 14, 23, 24) and accounted for 5.85% of the variance. These items

represented affective engagement. The fourth factor, Family Support for Learning, represented affective engagement. This factor contained 4 items (1, 12, 20, 29) and accounted for 3.50% of the variance. The fifth factor, Control and Relevance of Schoolwork, contained 6 items (15, 25, 26, 33, 34, 35) and accounted for 1.94% of the variance. These six items represented cognitive engagement.

Contrary to previous studies, however, it should be noted that three items cross loaded on two or more factors. Items 27 and 28 loaded onto both Teacher-Student Relationships (.295 and .211, respectively) and Peer Support at School (.390 and .217, respectively). Item 9 loaded onto both Future Aspirations and Goals and Control and Relevance of Schoolwork (.270 and .291, respectively). In addition, item 2 did not load onto any of the factors, with coefficients ranging from .170 to .226 across Teacher-Student Relationships, Future Aspirations and Goals, and Control and Relevance of Schoolwork. Thus, items 27, 28, 9, and 2 were not retained in the final model.

In Table 4.2, the sorted factor loadings associated with the final model are presented. As can be seen in the Table, all retained items loaded uniquely onto the five-factor model. However, standardized factor loadings varied. Family Support for Learning had the strongest loadings (> .573) but only contained four items. Control and Relevance of Schoolwork had the weakest loadings (> .285). Item 17, which loaded onto Future Aspirations and Goals, was the strongest individual item loading (.968). Table 4.2 also presents Cronbach's alpha values for each of the factors. The size of the coefficients indicates the reliability of scores on each of the SEI factors was adequate.

Table 4.2
Item Loadings on SEI Factors

Item	*TSR **(AE)	ASP (CE)	Peer (AE)	Family (AE)	C/R (CE)	Item Description
5	**.776**	-.036	.045	-.110	-.084	Adults at my school listen to the students.
13	**.645**	-.074	.078	.031	.042	Most teachers at my school are interested in me as a person, not just as a student.
21	**.634**	.079	-.050	.120	-.069	Overall, adults at my school treat students fairly.
31	**.632**	-.167	-.037	.054	.253	At my school, teachers care about students.
16	**.586**	.007	-.056	.039	.074	Overall, my teachers are open and honest with me.
3	**.570**	.107	-.034	.058	-.081	My teachers are there for me when I need them.
22	**.510**	.041	-.108	.005	.295	I enjoy talking to the teachers here.
10	**.378**	.151	-.004	-.016	.104	The school rules are fair.
17	.060	**.968**	.069	-.078	-.205	I plan to continue my education following high school.

Table 4.2 (continued)

Item	*TSR **(AE)	ASP (CE)	Peer (AE)	Family (AE)	C/R (CE)	Item Description
11	.202	**.726**	-.016	.025	-.104	Going to school after high school is important.
19	-.056	**.637**	-.038	-.017	.223	School is important for achieving my future goals.
30	-.173	**.536**	.021	.093	.174	I am hopeful about my future.
8	-.044	**.531**	-.004	.070	.201	My education will create many future opportunities for me.
6	.036	-.108	**.778**	.000	.109	Other students here care about me.
4	-.086	.040	**.763**	-.033	.042	Other students here like me the way I am.
7	.037	.029	**.662**	-.009	.082	Students at my school are there for me when I need them.
23	-.040	.059	**.630**	.064	-.038	I enjoy talking to the students here.
14	.235	-.033	**.595**	-.031	-.031	Students here respect what I have to say.
24	-.180	.064	**.477**	.086	-.042	I have some friends at school.

Table 4.2 (continued)

Item	*TSR **(AE)	ASP (CE)	Peer (AE)	Family (AE)	C/R (CE)	Item Description
20	.075	.017	.041	**.789**	-.082	When I have problems at school, my family/guardian(s) are willing to help me.
1	.044	.024	.081	**.713**	-.143	My family/guardian(s) are there for me when I need them.
29	-.038	-.007	-.053	**.701**	.099	My family/guardian(s) want me to keep trying when things are tough at school.
12	.053	-.012	.016	**.573**	.085	When something good happens at school, my family/guardian(s) want to know about it.
26	.072	-.078	.065	-.009	**.519**	The tests in my classes do a good job of measuring what I'm able to do.
33	.159	.143	.061	-.159	**.498**	Learning is fun because I get better at something.
35	.114	.120	-.026	.042	**.469**	The grades in my classes do a good job of measuring what I'm able to do.

Table 4.2 (continued)

Item	*TSR **(AE)	ASP (CE)	Peer (AE)	Family (AE)	C/R (CE)	Item Description
34	.055	.307	-.005	-.104	**.452**	What I'm learning in my classes will be important in my future.
25	-.135	.208	-.015	.226	**.398**	When I do well in school it's because I work hard.
15	.052	.096	.058	.116	**.285**	When I do schoolwork I check to see whether I understand what I'm doing.
Variance Explained	27.84	7.06	5.85	3.50	1.94	
Cronbach's α	.846	.844	.827	.802	.742	
Post-Rotation Eigenvalues	5.70	5.51	4.07	5.05	5.42	

*TSR: Teacher-Student Relationships
ASP: Future Aspirations and Goals
Peer: Peer Support at School
Family: Family Support for Learning
C/R: Control and Relevance of Schoolwork

**CE: Cognitive Engagement
AE: Affective Engagement

Correlational analysis. Correlations among the five factors of the SEI and the district outcome variables are presented in Table 4.3. As expected, both credit completion and GPA correlated in expected directions across all five SEI factors, with credit completion ranging from .037 to .368, and GPA from .029 to .412. These findings are consistent with the hypothesis that cognitive and affective engagement are positively

related to academic outcomes. Future Aspirations and Goals had the strongest correlations with credit completion and GPA, with coefficients of .368 and .412, respectively. Peer Support at School had the weakest correlation with credit completion and GPA, with coefficients of .037 and .029, respectively. Alternatively, minor and major behavioral referrals correlated negatively across the five factors, except for two positive associations between minor behavioral referrals and Peer Support at School and Family Support for Learning (.033 and .015, respectively). These negative correlations were not statistically significant, ranging from -.075 to -.248.

The five SEI factors were all positively related, with correlations ranging from .302 to .625. These correlations suggested a moderate to strong relationship between factors.

Table 4.3
Pearson Correlation Matrix between Factors and Outcomes

Major Factors	TSR (AE)	C/R (CE)	Peer (AE)	Asp (CE)	Family (AE)	Credit	GPA	Minor
Teacher-Student Relationships (AE)								
Control/Relevance (CE)	.593							
Peer Support (AE)	.326	.343						
Aspirations (CE)	.448	.625	.302					
Family Support (AE)	.443	.480	.386	.486				
Credit	.175	.158	.037	.368	.154			
GPA	.213	.227	.029	.412	.219	.818		
Minor	-.112	-.102	.033	-.105	.015	-.100	-.117	
Major	-.154	-.142	-.075	-.248	-.094	-.255	-.338	.286

Regression Analyses

Sequential logistic regression analyses were performed on each dichotomous outcome variable (credit completion, minor behavioral referral, and major behavioral referral). A sequential multiple regression was performed on GPA, a continuous outcome variable. These analyses were used to estimate the unique relationship among cognitive and affective engagement and student achievement and behavioral data. The regression analyses addressed the three research questions:

1. Controlling for demographic and risk variables, what is the direction and strength of the relationship between measures of cognitive and affective engagement gathered from the SEI self-report measure and student achievement outcomes as measured by 9th grade, first semester GPA?

2. Controlling for demographic and risk variables, what is the direction and strength of the relationship between self-report data on cognitive and affective engagement as obtained from the SEI and number of behavioral discipline referrals?

3. Controlling for demographic and risk variables, what is the direction and strength of the relationship between self-report data on cognitive and affective engagement as obtained from the SEI and credit completion?

Grade point average. Table 4.4 presents the results of the sequential multiple regression analysis. After controlling for demographic and risk factors (ethnicity, special education status, gender, and FRL status) in Step 1, SEI factors were inputted in Step 2. The control variables accounted for 16% of the variance in GPA ($R^2 = .16, p < .001$). The Free and Reduced Lunch (FRL) variable (b = -.83, $p < .001$) had the strongest negative relationship with GPA, while ethnicity (b = -.04, $p = .354$) showed the weakest relation. The five engagement factors accounted for an additional 13% of the variance in GPA ($R^2 = .29, p < .001$) and was statistically significant. Future Aspirations and Goals were uniquely associated with GPA (b = .15, $p < .001$). Peer Support at School was also statistically related to GPA (b = -.05, $p < .05$) but in a negative direction. Family Support for Learning (b = .05, $p = .124$), Teacher-Student Relationships (b = .03, $p = 138$), and Control and Relevance of Schoolwork (b = -.01, $p = .893$) were not statistically related to GPA.

Table 4.4
Regression of GPA on Covariates and SEI Factors

Predictors	Model 1				Model2			
	b	Std. Error	β	*p*	*b*	Std. Error	β	*p*
Gender	.26	.11	.11	**.021**	.25	.10	.11	.015
FRL Status	-.83	.12	-.35	**.000**	-.64	.11	-.27	**.000**
Ethnicity	-.05	.14	-.02	.724	-.15	.13	-.05	.251
Special Education Status	-.43	.17	-.12	**.011**	-.46	.16	-.13	**.003**
Teacher-Student Relationships (AE)					.03	.02	.09	.138
Control/Relevance (CE)					-.01	.03	-.01	.893
Peer Support (AE)					-.05	.02	-.13	**.010**
Aspirations (CE)					.15	.03	.32	**.000**
Family Support (AE)					.05	.03	.09	.124

Credit completion. Table 4.5 presents the results of the logistic regression analysis for credit completion. Odds ratios were computed to estimate the increase in the odds of credit completion associated with a one unit increase in each predictor variable. Model 1 consisted of the covariates inputted as controls (ethnicity, special education status, gender, and FRL status). The covariates were statistically significant predictors of credit completion. The strongest predictor was FRL status, with students classified as receiving free and reduced lunch having 67% less likely odds of attaining full credit than

those without FRL status. Students with special education status had 55% lower odds of attaining full credit. Females had 39% higher odds of attaining full credit than males. Ethnic identified non-white students were 21% less likely to attain full credit than students identified as white.

Future Aspirations and Goals was the only statistically significant factor in the logistic regression on credit completion (b = .36, $p < .001$). Each unit increase in Future Aspirations and Goals was associated with an increase of 44% in the odds of attaining full credit.

Table 4.5
Regression of Credit Completion on Covariates and SEI Factors

Predictors	Model 1				Model 2			
	b	SEb	*p*	Exp(B)	*b*	SEb	*p*	Exp(B)
Gender	.33	.23	.162	1.386	.39	.26	.127	1.472
FRL Status	-1.10	.25	**.000**	.329	-.81	.27	**.003**	.445
Ethnicity	-.23	.28	.411	.793	-.43	.30	.159	.654
Special Education Status	-.81	.33	**.014**	.445	-.93	.36	**.009**	.396
Teacher-Student Relationships (AE)					.08	.05	.106	1.078
Control/Relevance (CE)					-.09	.06	.163	.917
Peer Support (AE)					-.08	.05	.129	.928
Aspirations (CE)					.36	.07	**.000**	1.437
Family Support (AE)					.03	.07	.695	1.029

Minor behavioral referrals. Table 4.6 presents the results associated with the minor referrals logistic regression analysis. None of the demographic covariates that were entered on Step 1 were statistically significant. The SEI factors were inputted in Step 2 of the analysis. Findings indicated that none of the engagement factors were statistically associated with minor behavioral referrals.

Table 4.6
Regression of Minor Behavioral Referrals on Covariates and SEI Factors

Predictors	Model 1				Model 2			
	b	SEb	*p*	Exp(B)	*b*	SEb	*p*	Exp(B)
Gender	.08	.30	.795	1.079	.10	.30	.745	1.103
FRL Status	.26	.30	.384	1.301	.16	.32	.626	1.169
Ethnicity	-.23	.39	.543	.791	-.19	.39	.633	.828
Special Education Status	-.30	.47	.529	.745	-.29	.48	.633	.749
Teacher-Student Relationships (AE)					-.09	.05	.091	.915
Control/Relevance (CE)					-.05	.07	.475	.950
Peer Support (AE)					.08	.06	.178	1.083
Aspirations (CE)					-.11	.08	.177	.896
Family Support (AE)					.16	.10	.084	1.178

Major behavioral referrals. Results associated with the logistic regression of major behavioral referrals on student risk factors and SEI factors are presented in Table 4.7. In Step 1, covariates were again entered as controls. Gender (b =-.76, $p < .05$) and

FRL status (b =.82, $p < .05$) were statistically significant. Males were 53% more likely to receive a major behavioral referral than females. Students with FRL status were two and a half times more likely than non-FRL students to receive a major referral. Non-whites were also 41% less likely to receive a major behavioral referral while special education students were 88% more likely to be referred for a major behavioral infraction.

Findings in Step 2 of the analysis were similar to the other regression analyses. Future Aspirations and Goals was the only factor statistically related to the outcome (b =-.24, $p < .01$). The odds of receiving a major behavioral referral were 21% lower with each unit increase in this factor. Teacher-Student Relationships was predictive of major behavioral referrals, decreasing a student's likelihood of receiving a referral by 10%, but was not statistically significant ($p > .05$).

Table 4.7
Regression of Major Behavioral Referrals on Covariates and SEI Factors

Predictors	Model 1				Model 2			
	b	SEb	*p*	Exp(B)	*b*	SEb	*p*	Exp(B)
Gender	-.76	.33	**.020**	.469	-.83	.34	**.016**	.438
FRL Status	.82	.35	**.018**	2.274	.54	.37	.149	1.707
Ethnicity	-.54	.43	.204	.583	-.38	.44	.382	.681
Special Education Status	.63	.40	.114	1.878	.74	.42	.078	2.093
Teacher-Student Relationships (AE)					-.11	.06	.072	.896
Control/Relevance (CE)					.06	.08	.471	1.061
Peer Support (AE)					.01	.06	.831	1.013
Aspirations (CE)					-.24	.09	**.005**	.787
Family Support (AE)					.05	.10	.615	1.049

CHAPTER V

DISCUSSION

The purpose of the study was to investigate the factor structure of the SEI and to examine the relationship among affective, cognitive, behavioral, and academic factors of student engagement of 9th grade students. Using factor analytic procedures, this study appears to add support to previous studies of the SEI (Appleton et al., 2006; Betts et al., 2009; Reschly et al., 2008) that demonstrated good model fit and internal consistency of the five-factor model. Results from the logistic regression analyses supported conceptions of cognitive and affective engagement as important mediators in a student's academic achievement (Christenson et al., 2008). Overall, this study confirmed the importance of measuring cognitive and affective engagement and the impact these student values and beliefs have on educational outcomes (Appleton et al., 2008).

This study examined the hypothesis that cognitive and affective engagement have strong positive relations with academic engagement variables and significant negative association with behavioral engagement variables. Results generally supported the direction of the associations between cognitive and affective engagement and academic and behavioral engagement variables, although specific factor relationships within the cognitive and affective subtypes did not always follow the hypothesized direction. Regression analyses revealed unique positive relationships between cognitive engagement and the factor Future Aspirations and Goals in predicting academic and behavioral engagement outcomes.

Overall, the predictability of cognitive and affective engagement was not as strong as expected. Although previous studies have cited the importance of examining the multidimensionality of the engagement construct (Appleton et al., 2008; Fredericks et al., 2004; Glanville & Wildhagen, 2007; Reschly et al., 2008), findings from this study suggest that the student engagement typology should address the specific strengths of each factor and its effect on the relationship of the four subtypes. In particular, the importance of cognitive engagement relative to affective engagement in predicting GPA, credit completion, and minor and major behavioral referrals supports the conception of the engagement construct as being comprised of factors with unequal degrees of importance.

Discussion of Analytical Results

Exploratory factory analysis. Previous SEI studies (Appleton et al., 2006; Betts et al., 2009; Reschly et al., 2008) estimated a five-factor model of cognitive and affective engagement consisting of 33 items. Results of the current study also support a five-factor model. However, the current study of 9th grade students at a comprehensive high school (N = 371) provided the best model fit with a five-factor structure that consisted of only 29 items. Although each SEI item retained matched factor item groupings aligned with published factor keys (Appleton, February 3, 2010, personal correspondence), the cross loading of items 9 (most of what is important to know you learn in school), 27 (I feel safe at school), and 28 (I feel like I have a say about what happens to me at school) may point to potential overlap in factor definitions. Item 2 (after finishing my schoolwork I check it over to see if it's correct) was also not related to any factor. Future research with a

broader cross-section of students will likely be necessary to determine whether this item should be retained.

Research on the measurement of cognitive and affective engagement is in a nascent stage. The EFA results highlight the need to further examine the SEI factor structure. Cross-loadings suggest that some items may be representative of either cognitive or affective engagement as a whole rather than a single factor under each of the subtypes. Furthermore, three of the four items that were dropped (9, 27, 28) were identified under the Control and Relevance of Schoolwork factor in an SEI identification key that identifies the five factors (Appleton, February 3, 2010, personal correspondence). The weak predictive power of the Control and Relevance of Schoolwork factor in this study suggests the need for refinement of the items and further research on the factor's identification as representative of cognitive engagement.

Logistic and multiple regression analyses. Despite some contrasts with previous studies, findings from the regression analyses generally supported the notion that cognitive engagement is a more relevant predictor of student achievement and behavior than affective engagement. Similar to previous research of cognitive engagement using the SEI (Appleton et al., 2006; Betts et al., 2009; Reschly et al., 2008), Future Aspirations and Goals was a unique predictor of academic success. In the two regressions of GPA and credit completion, this factor showed the strongest unique relationship with the outcome. Future Aspirations and Goals was also a unique negative predictor of the major behavioral referral variable. These findings highlight the importance of Future Aspirations and Goals in understanding the overall engagement construct and the unique contribution of this factor to the subtype of cognitive engagement.

In addition, the predictive strength of the Future Aspirations and Goals factor in contrast to the other four factors suggests that the five factors that represent cognitive and affective subtypes may not be equally important predictors of student engagement. This finding counters findings in the extant literature. Researchers have posited that all of these factors are important components in understanding the values and beliefs that students bring to the educational environment (Appleton et al., 2008; Archambault et al., 2009; Reschly et al., 2008). However, it may be that some factors are more relevant in understanding cognitive and affective engagement and their relationship with educational outcomes. Findings suggest that cognitive engagement is a more significant subtype in predicting academic and behavioral engagement than affective engagement.

Predictive Factor Strengths

Previous studies have linked all five factors of cognitive and affective engagement to educational outcomes and personal well-being (Appleton et al., 2006; Betts et al., 2009; Reschly et al., 2008). However, the substantial variation in the predictive strength of each factor of cognitive and affective engagement across the four outcome variables in this study underscores the importance of improving the assessment of cognitive and affective engagement. Only one factor, Future Aspirations and Goals, was statistically significant in predicting students' academic and behavioral engagement. The findings of this study suggest that future development of the SEI should focus on replication of the initial validation study (Appleton et al., 2006). Furthermore, research needs to determine if the Future Aspirations and Goals factor is the most significant predictor of educational outcomes.

Results from this study counter previous SEI findings on the strength of specific factors and their associations with student outcomes. Family Support for Learning was a weak predictor in all of the regression analyses and did not relate to outcomes to the extent measured in other studies (Betts et al., 2009; Reschly et al., 2008). Furthermore, the exploratory factor analysis only identified four items (1, 12, 20, 29) for this factor. In contrast to findings of the current study, Reschly et al.'s (2008) study of student engagement with a sample of 293 students in grades 7 to 10 found that Family Support for Learning was statistically related to all three engagement subscales in that study. However, those engagement subscales represented social support and did not include academic outcome measures. The current study suggests that the Family Support for Learning factor may not be predictive of academic achievement indicators, although it may be more significant in measuring a student's well being and sense of belonging (Reschly et al., 2008).

The Control and Relevance of Schoolwork factor was not a significant predictor of academic achievement in any of the regression analyses, which countered the findings of previous studies (Appleton et al., 2006; Betts et al., 2009). Furthermore, Appleton et al. (2006) identified 9 items on the SEI that represent the Control and Relevance of Schoolwork factor. However, three of those items (2, 9, 27) did not fit the five-factor model of cognitive and affective engagement in this study's EFA. Correlations were in the expected directions, with positive associations with GPA and credit completion, and negative associations with minor and major behavioral referrals. The absence of significant relationships between the Control and Relevance of Schoolwork factor and academic and behavioral engagement variables suggests that findings from previous

studies (Appleton et al., 2006; Betts et al., 2009) may not be generalizable across demographic groups. Future study should test the link between this factor and academic engagement to determine its significance in the cognitive engagement subtype. It may be that the Control and Relevance of Schoolwork factor is more predictive of social well being than academic outcomes (Reschly et al., 2008).

Much research supports the relationship between students' peer influences and academic outcomes (Christenson et al., 2008; Finn, 1989; Osterman, 1998). Although Appleton et al. (2006) found that Peer Support at School was a significant factor in student academic and behavioral outcomes, findings from this study do not support previous work on the significance of peer influence on student engagement (Appleton et al., 2008; Fredericks et al., 2003). Contrary to expectations, Peer Support at School had a negative relationship with GPA and credit completion.

The explanations for the contrast between this study and previous research on the predictive significance of peer support at school are not clear. The context of the classroom administration of the SEI may have confounded responses to Peer Support at School factor items and dissuaded students from making truthful responses. The negative association between the Peer Support at School factor and GPA may be the result of disengaged students and their hesitation to admit an absence of friendship support while sitting among their peers. Administering this survey to students in private, away from peers, may have led to responses that better reflected student thought and aligned with the body of research on student engagement that identifies peer support as a powerful predictor of student academic success (Finn, 1989; Osterman, 1998).

The relative weakness of the Teacher-Student Relationships factor in predicting student outcomes was unexpected, especially on GPA and credit completion. Substantial research cites the development of supportive relationships between teachers and students as predictive of both student academic and behavioral outcomes (Klem & Connell, 2004; Ladd et al., 1999; Reeve et al., 2004). Although the Teacher-Student Relationships factor was a stronger predictor overall than Control and Relevance of Schoolwork, Peer Support at School, and Family Support for Learning, results did not reflect previous findings. Both Appleton et al. (2006) and Reschly et al. (2008) identified the Teacher-Student Relationships factor as significant in predicting academic and emotional outcomes. The weak associations of Teacher-Student Relationships with academic outcomes may be the result of timing of this study. The first semester administration of the SEI provided students with a five-month period to develop relationships with their teachers.

However, Teacher-Student Relationships did have a stronger relationship with behavioral engagement in this study, which reflects previous findings (Fredericks et al, 2004; Reschly et al. 2008; Skinner & Belmont, 1993). The link between teacher support for learning and positive emotions is well documented (Osterman, 1998; Reschly et al., 2008), and further studies utilizing the SEI should attempt to develop more refined outcome measures of student behavior to test the Teacher-Student Relationships factor and its ability to predict behavioral and emotional engagement.

Outcome variables. The only continuous outcome variable, GPA, exhibited relationships in expected directions for most of the cognitive and affective engagement factors. In addition, the distribution of the sample was symmetric. However, the relative

variability of GPA as a measure of academic achievement limited the overall strength of this variable in assessing relationships with predictor variables.

All three dichotomous outcome variables (credit completion, minor behavioral referral, major behavioral referral) provided limited predictability of the relationship between cognitive and affective engagement factors and educational outcomes. The dummy-coding of these three variables constrained the substantial differentiation in the data (e.g. the range of major behavioral referrals and course failures was from 1 – 7). The development of other continuous outcome variables, such as course-taking patterns or scores on state assessments, would allow for greater refinement in assessing the relationships of cognitive and affective engagement on student outcomes and provide data to make stronger inferences about the degree to which a student is disengaged from school. In addition, other variables that have been used to assess academic (time on task, homework completion) and behavioral (attendance, classroom participation, extra credit options) engagement (Appleton et al., 2006) would provide more meaningful data to support the unique predictive strengths of cognitive and affective engagement.

Based on the findings in this study, there remains little evidence that using the minor behavioral referral variable in future engagement studies will yield meaningful data on cognitive and affective engagement. None of the cognitive or affective engagement factors was statistically significant in predicting minor behavioral referrals (p = .084 - .475). Previous studies on student engagement have used the dichotomous variable of suspension, but have not differentiated among other behavioral referrals (Appleton et al., 2006; Caraway et al., 2003; Fredericks et al., 2004; Furlong et al., 2003). The behavioral incidents that make up the minor behavioral referral variable in this study

may not be of sufficient magnitude (i.e. cell phone infraction, tardiness) to capture a student's values and beliefs as measured by the SEI.

Limitations

This study had several limitations. First, this study was limited to a single freshman cohort at one suburban high school, and findings may not be relevant for students in other educational settings or locations. The relatively small (N = 371) and select sample limits the generalizability of this study. In addition, the sample included all 9th grade students at the end of the first semester (February, 2010), after substantial attrition had occurred among the freshmen class from September to February due to dropout and school enrollment changes. Many of those disengaged students lost to attrition or dropout may have had substantial impact on the findings of this study. The potential significance of the relationships among cognitive and affective engagement and academic and behavioral engagement outcomes may have been more supported had these students been examined prior to dropping out before the end of the first semester. Furthermore, the sample was predominately Caucasian and did not represent extensive cultural diversity. Therefore, findings may not be generalizable to other ethnic groups. This study would be strengthened by replication in larger, more culturally diverse educational institutions with all grade levels.

Second, this study only provides insight into a singular moment in the high school experience, and may not be representative of the cognitive and affective engagement of all students across grades 9-12. This is particularly important as a result of the maturational changes a student undergoes (LaNasa, Cabrera, & Trangsrud, 2009). As a result of the limited research on cognitive and affective engagement, it is difficult to infer

whether the findings in this study apply to other grade levels or are specific to this age group.

Finally, the subjective nature of self-report measures may have created biased findings. Although the strength of the design of the SEI is the measurement of a student's own perspective, this subjectivity could create biases, such as wanting to present oneself in a more positive or negative framework. A more comprehensive perspective of a student's cognitive and affective engagement may have been achieved through the use of additional forms of assessment, such as teacher- or parent-report instruments in addition to the self-report measure. Multiple measures would provide data from the internal, cognitive reality of a student, as well as the objective, observable phenomena which are the outward manifestations of a student's cognitive and affective engagement with school (Fredericks et al., 2004).

Future Implications

Although the study of freshmen dropout is essential given the high risk of dropout in the transition to high school (Finn, 2006; Zvoch, 2006), further research needs to approach the maturation of cognitive and affective engagement over the course of a student's career in school, particularly from grades 9-12 where dropout is highest (Finn, 2006). This is particularly important in light of college and career readiness standards and the challenges of preparing students for higher education (Conley, 2010). Longitudinal approaches would provide more relevant data regarding the growth and variability of cognitive and affective engagement related to a myriad of physical, social, and educational influences. Thus far, research utilizing the SEI has been confined to isolated

cross-sectional studies, and has failed to capture the longitudinal development of student engagement through different educational institutions and maturational levels.

In addition, the use of cross-sectional approaches in the study of cognitive and affective engagement limits the ability to create strong predictive connections between the subtypes of student engagement (Gutman & Midgley, 2000). The periodic measurement of a student's values and beliefs and their relationship to educational outcomes is important in understanding the influence of cognitive and affective engagement on dropout, which is a gradual process that may take years to become fully realized (Finn, 1989; Janosz et al., 2008). Furthermore, longitudinal research is critical in order to develop interventions that mediate the effects of low cognitive and affective engagement that lead to dropout (Fredericks et al., 2004)

There is a dearth of studies examining the amenability of cognitive and affective engagement to interventions (Christenson & Thurlow, 2004). Significantly, however, studies on high school dropout have identified characteristics of dropout that respond to intervention (Barton, 2004; Zvoch, 2006; Appleton et al., 2008) and are associated with engagement. Many of these studies have been limited to the holistic construct of student engagement and have not isolated the subtypes of cognitive and affective engagement. To address these gaps in the engagement literature, substantial research needs to test the amenability of these factors of cognitive and affective engagement to intervention. A link is clearly established in the literature between cognitive and affective engagement and educational outcomes, but specific research-based programs to effect widespread change in students' experiences and improved student outcomes is in its nascence. Future research needs to pursue the development of intervention systems for disengaged students

that are constructed from data on the specific factors of cognitive and affective engagement (Furlong & Christenson, 2008).

Interventions that address cognitive and affective engagement should target the underlying cognitive and affective factors that are associated with students' persistence and commitment to education. Students need to know that there is someone that they can rely on when they begin to become distracted from school. Interventions such as the *Check and Connect* program have been created to establish formalized, individual relationships between staff and students in order to foster an increased commitment to education (Christenson & Thurlow, 2004). The makeup of interventions that address low levels of cognitive and affective engagement have included sustained, personalized programs that build supportive relationships between students and adults along with explicit instruction that focuses on building students' confidence and persistence (Brophy, 2004).

Conclusion

Although the findings of this study lend credence to the view of student engagement as a multidimensional construct, future study needs to more precisely gauge the effects, over time, of each subtype and their dynamic interactions (Fredericks et al., 2004; Glanville & Wildhagen, 2007; Reschly et al., 2008). The strength of the Future Aspirations and Goals factor and the relative weakness of the Peer Support at School, Family Support for Learning, Control and Relevance of Schoolwork, and Teacher-Student Relationships factors provide data to support a view of the subtypes of cognitive and affective engagement as being more isolated in their effects. This disparity in the strength of each factor was unexpected and reveals the challenge of gauging the strength

of the interplay of each of the four subtypes of engagement – cognitive, affective, behavioral, and academic – and the factors that represent them. Future studies should determine the relative strengths of each subtype and the specific significance that cognitive and affective engagement exhibit in the multi-dimensional construct of student engagement.

REFERENCES

Alexander, K. L., Entwisle, D. R., & Horsey, C. S. (1997). From first grade forward: Early foundations of high school dropouts. *Sociology of Education, 70*, 87–107.

Anderson, A. R., Christenson, S. L., Sinclair, M. F., & Lehr, C. A. (2004). Check & Connect: The importance of relationships for promoting engagement with school. *Journal of School Psychology, 42*(2), 95-113.

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*(5), 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*(5), 427-445.

Archambault, I., Janosz, M., Fallu, J., & Pagani, L. (2009). Student engagement and its relationship with early high school dropout. *Journal of Adolescence, 32*(3), 651-670.

Assor, A., & Connell, J. P. (1992). The validity of students' self-reports as measures of performance affecting self appraisals. In D. H. Schunk & J. L. Meece (Eds.), *Student perceptions in the classroom* (pp. 25-47). Hillsdale, NJ: Lawrence Erlbaum Associaties, Inc.

Betts, J., Appleton, J. J., Reschly, A., Christenson, S. L., & Huebner, E. S. (2009). A study of the reliability and construct validity of the School Engagement Instrument (SEI) across grades. Manuscript submitted for publication.

Bollen, K. (1989). *Structural equations with latent variables*. New York: Wiley.

Brophy, J. (2004). *Motivating students to learn*. Mahwah, NJ: Lawrence Erlbaum.

Bryson, C., & Hand, L. (2007). The role of engagement in inspiring teaching and learning. *Innovations in Education & Teaching International, 44*(4), 349-362.

Carini, R. M., Kuh, G. D., & Klein, S. P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education, 47*(1), 1-32.

Causey, D. L., & Dubow, E. F. (1992). Development of a self-report coping measure for elementary school children. *Journal of Clinical Child Psychology, 21*, 47-59.

Christenson, S. L., Reschly, A. L., Appleton, J. J., Berman, S., Spangers, D., & Varro, P. (2008). Best practices in fostering student engagement. In A. Thomas & J. Grimes (Eds.), *Best practices in school psychology* (Vol. 5, pp. 1099-1120). Washington, DC: National Association of School Psychologists.

Christenson, S. L., & Thurlow, M. L. (2004). School dropouts: Prevention considerations, interventions, and challenges, *Current Directions in Psychological Science*, 13, 36-39.

Conley, D. (2010) *College and career ready.* San Francisco, CA: Jossey-Bass.

Connell, J. P., & Wellborn, J. G. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. In M. R. Gunnar & L. A. Sroufe (Eds.), *Self processes and development* (Vol. 23, pp. 43 – 77). Hillsdale, NJ: Lawrence Erlbaum.

Corno, L. (1993). The best-laid plans: Modern conceptions of volition and educational research. *Educational Researcher, 22,* 14–22.

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

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

Finn, J. D. (1993). School engagement and students at risk. Washington, DC: National Center for Education Statistics.

Finn, J. D.,& Rock, D. A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology, 82*, 221-234.

Fredricks, 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.

Fredricks, J. A., & Eccles, J. S. (2002). Children's competence and value beliefs from childhood through adolescence. *Developmental Psychology*, *38*(4), 519-553.

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*, 300-319.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologists, 58*, 218-226.

Fredrickson, B. L., & Joiner, T. (2002). Positive emotions trigger upward spirals toward emotional well-being. *Psychological Science, 13*, 172-175.

Furlong, M. J., & Christenson, S. L. (2008). Engaging students at school and with learning: A relevant construct for all students. *Psychology in the Schools, 45*(5), 365-368.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology, 95*, 148-162.

Glanville, J. L., & Wildhagen, T. (2007). The measurement of school engagement: Assessing dimensionality and measurement invariance across race and ethnicity. *Educational & Psychological Measurement, 67*(6), 1019-1041.

Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationship to motivation and achievement. *Journal of Early Adolescence, 13*, 21-43.

Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education, 62,* 60-71.

Greene, B. A., & Miller, R. B. (1996). Influences on course performance: Goals, perceived ability, and self-regulation. *Contemporary Educational Psychology, 21*, 181-192.

Greene, B. A., Miller, R. B., Crowson, H. M., Duke, B. L., & Akey, K. L. (2004). Predicting high school students' cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology, 29*(4), 462-482.

Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil, P.B. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (3rd ed., pp. 403-422). New York: Longman.

Gutman, L. M., & Midgley, C. (2000). The role of protective factors in supporting the academic achievement of poor African American students during the middle school transition. *Journal of Youth and Adolescence, 29*(2), 223-148.

Janosz, M., Archambault, I., Morizot, J., & Pagani, L. S. (2008). School engagement trajectories and their differential predictive relations to dropout. *Journal of Social Issues, 64*, 21-40.

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.

Jöreskog, K. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36*, 409-426.

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

Kortering, L., & Braziel, P. (2008). Engaging youth in school and learning: The emerging key to school success and completion. *Psychology in the Schools, 45*(5), 461-465.

Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence. *Child Development, 70,* 1373-1400.

LaNasa, S. M., Cabrera, A. F., & Trangsrud, H. (2009). The construct validity of student engagement: A confirmatory factor analysis approach. *Research in Higher Education, 50*(3), 315-332.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*, 803-855.

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.

Miller, R. B., Greene, B. A., Montalvo, G. P., Ravindran, B., & Nichols, J. D. (1996). Engagement in academic work: The role of learning goals, future consequences, pleasing others, and perceived ability. *Contemporary Educational Psychology, 21*, 388-422.

McMahon, S. D., Parnes, A. L., Keys, C. B., & Viola, J. J. (2008). School belonging among low-income urban youth with disabilities: Testing a theoretical model. *Psychology in the Schools, 45*(5), 387-401.

Osterman, K. F. (1998, April). *Student community within the school context: A research synthesis*. Paper presented at the annual meeting of the American Educational Research Association, San Diego, CA. Retrieved from ERIC database (ED425519).

Pace, C. R. (1984). *Measuring the Quality of College Student Experiences*. Higher Education Research Institute. Los Angeles: University of California.

Pokay, P., & Blumenfeld, P. C. (1990). Predicting achievement early and late in the semester: The role of motivation and use of learning strategies. *Journal of Educational Psychology, 82*, 41-50.

Raykov, T. (1997). Estimation of composite reliability for congeneric measures. *Applied Psychological Measurement, 21*, 173-184.

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion, 28*(2), 147-169.

Reschly, A. L., & Christenson, S. L. (2006). 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., Huebner, E. S., Appleton, J. J., & Antaramian, S. (2008). Engagement as flourishing: The contribution of positive emotions and coping to adolescents' engagement at school and with learning. *Psychology in the Schools, 45*(5), 419-431.

Ryan, R. M., Stiller, J., & Lynch, J. H. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and self-esteem. *Journal of Early Adolescence, 14*, 226-249.

Sharkey, J. D., Sukkyung, Y., & Schnoebelen, K. (2008). Relations among school assets, individual resilience, and student engagement for youth grouped by level of family functioning. *Psychology in the Schools, 45*(5), 402-418.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effect of teacher behavior and student engagement across the school year. *Journal of Educational Psycholgoy, 85,* 571-581.

Yazzie-Mintz, E. (2007). *Voices of Students on Engagement: A Report on the 2006 High School Survey of Student Engagement*: Center for Evaluation and Education Policy, Indiana University.

Zvoch, K. (2006). Freshman year dropouts: Interactions between student and school characteristics and student dropout status. *Journal of Education for Students Placed at Risk, 11*, 97-117.