MAKING THE LEAP: AN EXAMINATION OF STUDENT ENGAGEMENT AND EARLY WARNING INDICATORS ACROSS THE MIDDLE SCHOOL TRANSITION

by

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(Under the Direction of Amy L. Reschly)

ABSTRACT

School completion has profound, favorable implications on individuals, communities, and society. Student engagement has emerged as the prominent theoretical model by which educators comprehend school completion and withdrawal (Christenson, Reschly, & Wylie, 2012). Previous longitudinal studies have demonstrated the utility of monitoring student engagement, as early school withdrawal can be predicted as early as first grade (Alexander, Entwisle, & Horsey, 1997; Balfanz, Herzog, & Mac Iver, 2007). The current study aimed to extend this research by investigating the predictive utility of student engagement with regard to being "at risk" in sixth grade. Results of logistic regressions indicated that student engagement was predictive of students' risk statuses for the fourth grade cohort but not for the fifth grade cohort. Additionally, when demographic variables, special education / EL distinction, and achievement were added, student engagement became insignificant.

INDEX WORDS: Elementary student engagement, Early warning systems, SEI-E

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Introduction

Prominent researchers in the fields of dropout prevention and student engagement have called for longitudinal research examining the developmental progression and trajectories of student engagement, as they pertain to school completion and post-secondary success (Carter et al., 2012; Finn & Zimmer, 2012; Reschly & Christenson, 2012). As school completion and dropout are long-term processes, rather than singular events, predictive value exists in examining trajectories of student engagement for the purposes of identification and early intervention (Reschly & Christenson, 2012). As a response to stagnant school completion rates, school districts have begun utilizing Early Warning Systems, which are designed to identify student risk factors associated with dismal outcomes (Balfanz, Herzog, & Mac Iver, 2007). The purpose of Early Warning Systems is to facilitate early identification and intervention of students at risk of falling off the track to graduation and onto the path of disengagement and dropout. Research has demonstrated the predictive value of both Early Warning Systems and monitoring student engagement as early as elementary school (e.g., Alexander, Entwisle, & Horsey, 1997; Balfanz et al., 2007; Carter et al., 2012); however, few studies have examined the associations among student engagement variables and early warning indicators, specifically. Further research is warranted to examine these associations, for the purposes of designing more sensitive early identification, prevention, and intervention programs.

School Completion

In his 1989 seminal article, Finn likened school dropout to a "national obsession" (p. 117). A National Education Goals Report (1995) highlighted the urgency of developing dropout interventions, noting that half of the U.S. prison population in 1992 was high school dropouts. Despite legislation and reform initiatives (e.g., No Child Left Behind [NCLB], 2002; Race to the Top Act, 2011), only minor increases have been observed in the dropout rate over the last 20 years (Stetser & Stillwell, 2014). Initiatives have attempted to hold school districts accountable for student achievement, improved graduation rates, and post-secondary preparedness. One objective common to virtually all reform initiatives is school completion, which is defined as graduation from high school with the skills necessary to succeed in post-secondary education and/or the workforce (Appleton, Christenson, & Furlong, 2008; Christenson et al., 2008).

School completion has vast implications for individuals, communities, and the nation as a whole. Research shows that individuals who complete school on time with a regular diploma enjoy greater job security, lower instances of unemployment, and lower dependency on government assistance programs such as Medicaid and/or food stamps (Alliance for Excellent Education [AEE], 2011b). School completion has positive repercussions for local and national economies, including greater spending (e.g., home and auto sales, investments), higher state and federal tax revenues, and increased human capital (AEE, 2011a). Moreover, a report by the AEE (2011b) showed that high school graduates are healthier, live longer, and are less likely to be teen parents.

Non-completion has dire consequences on the economy and the welfare of communities across the country. Non-completers are more likely to rely on public services such as housing assistance and are less likely to engage in pro-social activities such as volunteering (AEE, 2011a). Additionally, non-completers are more likely to be unemployed, especially during tough economic

climates. Over the period from 2002 to 2009, participation in the job market among non-completers decreased from 68 to 48 percent (Aud, KewalRamani, Frohlich, & National Center for Education Statistics, 2009).

In addition to greater job security, school-completers enjoy increased earnings compared to non-completers. In 2009, the average income for a school-completer was $27,380, compared to only $19,540 for a high school dropout (AEE, 2011b). An annual difference of just under $8,000 per year for thirty years equals approximately $240,000 in lost wages, and thus, lost tax revenue and spending. Moreover, considering the poverty threshold for a family of four in 2009 was $20,050, the average high school dropout faces a lifetime of financial hardship (Federal Register, 2009). Income disparity is even greater when comparing individuals with high school diplomas to their peers with bachelor's degrees. In 2004, the expected lifetime earnings of males with a bachelor's degree were 96% higher than males with only a high school diploma (Kirsch et al., 2005). With over 30% of students failing to complete high school on time with a regular diploma, it is economically and socially imperative that the nation rally behind efforts to increase school completion and post-secondary readiness (AEE, 2011a).

School completion has obvious implications for the workforce. By 2018, it is estimated that the number of jobs will exceed the number of college graduates available to fill them (AEE, 2011a). This gap exists mainly due to the fact that job growth is expected to be highest in fields that require post-secondary education, such as management, scientific, medical, and technical consulting industries. Furthermore, industries that have not traditionally required post-secondary education (e.g., farming, production) will see the fastest rates of decline (Lacey & Wright, 2009). For example, manufacturing jobs in the U.S. have declined by almost 25% over the last half-century. In addition, employment in positions requiring post-secondary education was expected to

account for approximately half of all job growth over the last decade (Kirsch, Braun, Yamamoto, & Sum, 2005). Thus, it is more important than ever that our nation's students complete high school with the skills necessary to succeed in higher education endeavors and prosper in the increasingly technical job market.

Predictors of Dropout and School Completion

Empirical research has led to the identification of two categories of factors associated with negative outcomes (e.g., school withdrawal): status risk factors and alterable risk factors (Finn & Zimmer, 2012). Status risk factors are those that are not alterable in nature, and thus they are of little use from a school-based intervention standpoint. They include one's socioeconomic status (SES) and race/ethnicity, as well as home/family variables such as early parenthood, family structure, and English language use in the home, all which have been linked to academic outcomes (Rumberger, 1995; Finn & Zimmer, 2012). Conversely, alterable risk factors, or what Christenson et al. (2008) refer to as functional risk factors, are amenable in nature and thus have critical implications on identification and intervention of students at risk for school withdrawal. Functional risk factors include poor academic performance, retention, problem behavior, and poor attendance (Christenson et al., 2008; Finn & Zimmer, 2012).

In their seminal study of early foundations of dropout, Alexander et al. (1997) identified both status and alterable risk factors present in first grade that were predictive of later school withdrawal. Status risk factors that increased the risk of dropout included lower SES, residing in a single-parent household, having multiple siblings, and being born to a younger mother. Of note, 75% of students classified as low-SES were dropouts compared to 23% of students of average-SES. Rumberger (1995) found that students from low-SES households were two times as likely to dropout as students from average- to high-SES households. Patterns that are still apparent in recent

data from the National Center for Education Statistics (NCES) indicate that fewer students from economically disadvantaged backgrounds complete school on time with a regular diploma (e.g., 72%; Stetser & Stillwell, 2014).

Alterable risk factors are also predictive of school withdrawal. These alterable risk factors may be found at the individual, family, and school/community levels. Research has demonstrated that individual-level factors such as academic self-image, satisfaction with school, and locus of control are weakly associated with dropping out (Alexander et al., 1997). More significantly, tardiness, absences, and discipline referrals strongly predicted early school withdrawal. For example, students were 5% more likely to drop out for every day missed after ten absences. Dropouts averaged 16 absences in first grade, which increased their odds of leaving school early by 30%. Additionally, grade retention has been shown to increase the likelihood of students dropping out (Alexander et al., 1997); a consistent finding across research studies (e.g., Jimerson, 1999; Reschly & Christenson, 2006; Rumberger, 1995). In Rumberger's analysis of NELS data, grade retention was the most powerful predictor of future dropout (Rumberger, 1995).

School-level factors associated with early school withdrawal include performance goal structures, low quality of instruction, and few caring teacher-student relationships (Holas & Huston, 2012; Hughes, Wu, & West, 2011). For example, Reschly and Christenson (2006) found that while boredom increased a student's odds of dropping out by 35%, higher perceptions of school warmth decreased the odds of dropping out by 20%. Research has demonstrated that family-level factors including family support for learning and parental supervision are also significantly associated with school completion and early school withdrawal (Rumberger, 1995).

Great utility exists in examining alterable risk and protective factors as they, unlike status variables, can inform school-based interventions. In an examination of resilience among students

at risk for school failure, Finn and Rock (1997) found higher self-esteem and sense of control, regular attendance, fewer discipline referrals, and personal and academic support provided by teachers and parents were protective factors for successful school completion. Additional factors associated with decreased odds of dropping out include caring, effective teachers, learning atmospheres built upon mastery standards, supportive school communities, school-family partnerships, and opportunities for involvement in nonacademic school activities (National Research Council, 2004). Furthermore, research has shown that students whom attend schools with fair discipline policies are less likely to drop out (Rumberger, 1995). Although status factors are meaningful, particularly from a social justice point of view, research demonstrates the importance of targeting amenable factors in developing and implementing early identification and intervention plans for students at-risk of early school withdrawal. See Table 1 for additional alterable variables associated with school completion and withdrawal.

Theoretical Background

"Successful school completion is dependent on student engagement" (Morse, Anderson, Christenson, & Lehr, 2004, p. 9). The multi-dimensional perspective of engagement was conceptualized in the 1980s as a way of comprehending disengagement and ameliorating dropout (Appleton et al., 2006; Finn & Zimmer, 2012). It has emerged as an important predictor of school completion, as well as short term outcomes such as attendance, student achievement, and social-emotional well-being (Christenson, Reschly, & Wylie, 2012). Moreover, student engagement is considered to be a protective factor with regard to educational risk, as empirical evidence has illustrated its positive relationship with academic performance and negative association with poor outcomes (Finn & Rock, 1997).

Student engagement is a multidimensional construct encompassing an individual's participation, identification, and investment in school and with learning (Appleton, Christenson, & Furlong, 2008; Christenson & Anderson, 2002). Of great importance from an early-intervention standpoint, "student engagement is the glue, or mediator, that links important contexts—home, school, peers, and community—to students and, in turn, to outcomes of interest" (Reschly & Christenson, 2012, p. 3). Furthermore, engagement is malleable as it is highly influenced by factors in one's environments (e.g., peers, teachers, school policies, family influences; Christenson et al., 2008; Reschly & Christenson, 2012). To date, there are three prominent theoretical models by which student engagement has been conceptualized, recognized, and analyzed.

Finn's (1989) seminal theory of student engagement, the Participation-Identification model, conceptualizes school completion and non-completion as gradual, ongoing processes rather than single events. Participation is defined as involvement in school and is characterized by behaviors such as attendance, task completion, sustained attention, and participation in extracurricular activities. The second component, identification, is emotional in nature, and it encompasses one's interest, belonging, valuing, and positive attitude about school and learning (Appleton et al., 2008; Finn & Zimmer, 2012). Finn posited that students' active participation in school leads to academic success and in turn, identification with school leads to increased participation in school, creating a cycle of participation-success-identification. The culmination of this process is school completion.

On the other hand, a process of disengagement persists for students characterized as non-participators. In the cycle of disengagement, infrequent participation leads to poor school performance, and poor school performance leads to decreased participation, ultimately resulting in disengagement and/or withdrawal from school (Finn, 1989). Disengaged students are characterized as apathetic, disinterested, and bored (Connell & Wellborn, 1991; Finn & Zimmer,

2012). Disengagement encompasses such behaviors as reduced participation in class or school activities/functions, reduced sense of belonging and motivation, and/or counterproductive behavior, all of which have inverse relationships with school completion (Finn & Zimmer, 2012).

Some researchers (e.g., Skinner & Pitzer, 2012) conceptualized engagement as an "outward manifestation of motivation" (p. 22). In this conceptualization, motivation is comprised of energy (e.g., effort, enthusiasm), purpose (e.g., interest, focus), and durability (e.g., persistence, determination). The motivational framework encompasses both engagement and disaffection each situated within behavioral and emotional dimensions. Engagement refers to enthusiastic, goal-directed, determined pursuits in academic activities, while disaffection is characterized by passivity, withdrawal, and boredom. Of note, disaffection is not merely the lack of engagement, rather a maladaptive state of being (Skinner, Furrer, Marchand, & Kindermann, 2008). Behavioral engagement includes initiation, persistence, concentration, and involvement while behavioral disaffection is characterized by withdrawal, disengagement, inattention, and passivity. Emotional engagement is comprised by students' emotional states during learning tasks and includes satisfaction, enthusiasm, and interest. Emotional states such as boredom, frustration, and disinterest fall within the emotional disaffection dimension (Skinner et al., 2008).

Other motivational researches conceptualize motivation and engagement as self-system processes (Connell & Wellborn, 1991). In this theoretical model, the psychological needs for competence, autonomy, and relatedness and their interactions with the environment are stressed. Specifically, the model focuses on the processes of context, self, action, and outcomes. As applied to school contexts, action takes the form of engagement or disaffection, with the outcomes being skill acquisition and adjustment (Connell & Wellborn, 1991). This model emphasizes the role of the context (e.g., school) in facilitating action. For example, "when psychological needs are being

met within particular cultural enterprises such as family, school, and work, engagement will occur and be manifested in affect, behavior, and cognition" (Connell & Wellborn, 1991, p. 52).

Although several models with varying typologies exist, perhaps the model most applicable to school measurement and intervention efforts includes four domains of engagement: behavioral, cognitive, affective, and academic (Christenson & Anderson, 2002; Appleton et al., 2008). *Behavioral engagement* includes participatory activities such as involvement in academic and extra curricular activities, as well as attendance. *Cognitive engagement* refers to a student's self-efficacy, intrinsic motivation, task-valuing, self-regulation, and use of learning strategies (Appleton et al., 2008; Dotterer & Lowe, 2011; Rudolf et al., 2001; Wang & Eccles, 2012). *Affective engagement* (e.g., psychological, emotional) taps into an individual's sense of belonging and identification with the school environment and individuals (e.g., teachers, students) within the school environment (Appleton et al., 2008; Li et al., 2011; Wang & Eccles, 2012). Finally, *academic engagement* refers to efforts in academic tasks such as credit accrual, time on task, and work completion (Christenson & Anderson, 2002; Appleton et al., 2008).

Although multiple definitions and typologies of student engagement exist, substantial overlap is found among the models. Most theorists agree that at a minimum, student engagement is comprised of behavioral and affective components (Reschly & Christenson, 2012). Additionally, theorists recognize the role of context in facilitating engagement. Contextual variables (e.g., school warmth, fair discipline policies, family and peer support for learning, caring teacher-student relationships), also known as facilitators, shape an individual's engagement with school. Importantly, many facilitators are malleable; thus, so is engagement (Reschly & Christenson, 2012) .

Of great significance, engagement is linked to outcomes of interest. It has strong associations with academic achievement, school completion, and even future success (e.g., employment, health and well-being; Finn, 2006; Reschly & Christenson, 2006). For example, data from a nationally representative longitudinal study found that 83% of successful completers entered post-secondary education compared to only 30% of non-completers (e.g., those who were still in high school or had not earned a diploma by age 20). Of those 30%, a startling 3% entered 4-year institutions (compared to approximately 50% of successful completers; Finn, 2006). Combined, these results indicate that students who fail to graduate on time, with the skills necessary to succeed, participate in post-secondary education at far lower rates than their peers. Finn (2006) also found that non-completers were the least engaged with school, and that attendance and behavior in high school were consistently related to post-secondary employment. Overall, given its long-lasting effects on individuals, as well as its utility from an intervention standpoint, student engagement is a critical area for further research (Reschly & Christenson, 2012).

Student Engagement: A Developmental Perspective

Research supports a developmental model of student engagement and disengagement relative to school completion and dropout. For example, dropout and completion can be predicted as early as first grade based upon an individual's attendance, behavior, academic performance, and attachment to school (Alexander, Entwisle, & Dauber, 1993; Reschly & Christenson, 2012). Barrington and Hendricks (1989) found that with as few as six absences, dropouts could be distinguished from school completers with 66% accuracy by third grade. By fifth grade, students who eventually dropped out were absent twice as often as students who completed school.

Furthermore, dropouts were more likely to be referred for special education services (51% compared to 30% of school completers; Barrington & Hendricks, 1989).

Adolescence is one of the most critical periods for individuals, especially with regard to school outcomes. Perhaps this is so because "few developmental periods are characterized by so many changes at so many different levels—changes due to pubertal development, social role redefinitions, cognitive development, school transitions, and the emergence of sexuality" (Eccles et al., 1993, p. 90). Eccles et al. (1993) posited that the sometimes tumultuous nature of this developmental period results from an interaction between the changing individual and his/her changing environment. Middle school environments often do not meet adolescents' needs for autonomy, relatedness, and control, and are thus, a poor stage-environment fit (Connell & Wellborn, 1991; Eccles et al., 1993).

Research demonstrates that early adolescents experience a marked decline in their grades and motivation as they transition from elementary school to middle school (Eccles et al., 1993). Research has shown that overall student engagement, achievement, and perceived school-competence decreases over the transition from elementary to middle school (Dotterer & Lowe, 2011; Ladd & Dinella, 2009; Holus & Huston, 2012). Proposed instigators of this decrease include perceived social support (Li et al., 2011; Martinez et al., 2011; Wang & Eccles, 2012), structure and context of middle schools (e.g., multiple teachers, lower quality of teacher-student relationships, higher expectations, performance goals, changes in peer groups as a result of the transition, larger student body; Dotterer & Lowe, 2011; Holus & Huston, 2012; Martinez et al., 2011; Rudolph et al., 2001), and developmental inappropriateness of middle schools (e.g., timing of transition with regard to puberty, increased reliance on self-regulatory behaviors; Holus & Huston, 2012; Rudolph et al., 2001; Trentacosta & Shaw, 2009).

The aforementioned instigators, including social support, teacher-student relationships, and goal structures, share common ground with affective and cognitive student engagement. Ladd and Dinella (2009) investigated changes in behavioral and affective school engagement across the elementary and middle school years. Their study focused on the unique contributions of cooperative participation and receptiveness toward school. Results indicated that children characterized by stable patterns of engagement across the elementary and middle school years exhibited higher levels of academic achievement. On the contrary, Wylie and Hipkins (2006) found that student engagement levels tend to decline over time (i.e., age 10 versus age 16), namely during adolescence. In this study, the declines were not due to school or school-level transitions.

Decreases in student engagement have been observed both seasonally (e.g., within school years) and across school years (Appleton, 2012). In a study of student engagement across the transition from elementary school to middle school, Li and Lerner (2011) found that even students characterized by high, stable levels of engagement experienced a decrease in emotional engagement beginning in middle school. The decrease was attributed to reduced feelings of belonging and connectedness in middle school. This finding is quite noteworthy, as the authors also found emotional and behavioral engagement were significant predictors of academic achievement and behavioral/emotional outcomes throughout the middle and high school years.

In addition to its predictive utility, student engagement has been shown to be a protective factor against a myriad of negative outcomes, including delinquent behavior, low motivation and reduced effort. Roeser, Eccles, and Sameroff (2000) found that adolescents who are cognitively engaged in school and with learning are less likely to cheat, skip classes, or engage in delinquent behavior. Conversely, results from structural equation models in Hirschfield and Gasper's (2011) study indicated that misconduct in adolescence decreases cognitive engagement. Adolescents who

perceive their schools as promoting content mastery and positive teacher-student relations show increased motivation to learn. Furthermore, students who report higher levels of perceived relatedness to parents, peers, and teachers report greater emotional engagement. In a study of emotional engagement, Park, Holloway, Arendtsz, Bempechat, and Li (2012) found correlations between increased perceived relatedness and student engagement; the increases were steeper for students with higher levels of academic achievement than for students with lower GPAs.

Facilitators of engagement such as positive school discipline practices, supervision of homework completion, and positive peer attitudes toward school and success can ease the transition from elementary school to middle school (Appleton, Christenson, & Furlong, 2008). Important predictors of student achievement, engagement, and perceived school competence include teacher-student relationships, classroom quality, and teacher efficacy. Students taught by efficacious teachers in warm environments had better test scores, engagement, and perceived self-confidence than those in lower-quality environments. Alarmingly, middle school teachers perceive lower levels of self-efficacy, compassion, and trust of their students than elementary school teachers (Holas & Huston, 2012). Perhaps these characteristics carry over to classroom dynamics, which tend to center around teacher control and limited opportunities for student decision making and self-management. Upper elementary school students report more opportunities for personal responsibility than do middle school students (Eccles et al., 1993). These contextual qualities conflict with the developmental needs of adolescents for increased autonomy and relatedness, thus resulting in decreases in affective and cognitive student engagement.

Research continues to highlight the importance of school and instructional climate on student engagement. Dotterer and Lowe (2011) investigated the relationship between classroom-level factors (e.g., quality of instruction, social/emotional climate, student-teacher relationship) and

student engagement. Results from their study indicated a significant, positive association between academic achievement and psychological and behavioral engagement. Furthermore, students who were more engaged demonstrated higher performance on the Woodcock Johnson Tests of Achievement. These findings illuminate the significant and positive role classroom context plays in student engagement and in turn, student outcomes.

Although there exists a wealth of research on adolescence and the middle school transition, several questions remain. The transition literature has yet to thoroughly examine the role of student engagement with regard to educational implications of the elementary to middle school transition (Holas & Huston, 2012). Furthermore, studies that have captured affective and/or cognitive student engagement data have relied on teacher-report and observational measures, rather than student self-report measures of their belonging/identification with school and their goal structures (Appleton et al., 2008). An examination of the relationship among student engagement indicators and individual- and school- level factors associated with the middle school transition, might reveal some additional areas for early identification and intervention.

Early Identification and Intervention

Of great importance to schools and society is the capacity to identify students at-risk for disengagement and/or non-completion. In developing, implementing, and monitoring school completion interventions, personnel must distinguish between indicators and facilitators of engagement (Christenson et al., 2008). Facilitators of engagement are useful in the planning and implementation of interventions (Christenson et al., 2008). Indicators, on the other hand, reveal a student's level of engagement with school, and include such exemplars as credit accrual, attendance, and discipline referrals. Indicators are of practical use in the identification and monitoring processes for students at risk of disengagement (Christenson et al., 2008).

In more recent years, there has been a shift in ideology from dropout prevention to promotion of school completion (Reschly & Christenson, 2012). Approaching the issue from this perspective has critical implications for intervention efforts. For instance, school completion interventions operate on an systems-ecological orientation, meaning that intervention efforts target the many contexts the student encounters on a day to day basis (e.g., home, school, social contexts). Additionally, a strength-based approach is employed to assist students in acquiring skills needed for success in the aforementioned contexts. Data collected through frequent progress monitoring should be used to inform intervention intensity and duration. Ultimately, the defining feature of school completion interventions is the goal of promoting positive outcomes for students, rather than simply preventing poor outcomes (Christenson, Sinclair, Lehr, & Godber, 2001).

The use of Early Warning Systems, while relatively young in conceptualization and implementation, may facilitate earlier identification and intervention of students at risk of falling off the track to graduation (Balfanz et al., 2007). Typical Early Warning Systems are comprised of indicators in the domains of attendance, behavior, and course performance (Mac Iver & Messel, 2013). Several studies have demonstrated the promise of Early Warning Systems at the middle- and high- school levels. For instance, in a longitudinal study of 13,000 students, Balfanz et al. (2007) found that students' risk statuses in 6th grade accurately predicted 60% of the students who ultimately did not graduate from high school. The indicators, examined in sixth grade, included attendance (i.e., missing 20% or more of school days), behavior (i.e., one or more out of school suspensions), and course performance (i.e., failure of English or mathematics).

Although early warning indicators of behavior, attendance, and course performance are directly associated with behavioral and academic student engagement, Early Warning Systems as a whole lack indicators around students' affective and cognitive engagement. As school dropout

remains a pervasive problem in the United States, student engagement serves as a promising area of intervention. Of special importance from a practical standpoint, engagement is malleable; that is, it is responsive to changes in the environment. Furthermore, it varies in intensity and duration; it can change in response to a specific context or persist over time (Fredricks, Blumenfeld, & Paris, 2004). Understanding and manipulating alterable factors that influence student engagement can have significant, positive effects on student outcomes.

Accurate measurement is a necessary component in the early detection and intervention of students at-risk for disengagement and/or non-completion. Research shows that students who start out engaged tend to stay more engaged throughout their educational experiences. For example, Ladd and Dinella (2009) found that children who experienced the highest levels of student engagement in first through third grades tended to maintain high levels as they proceeded through school. However, students who begin their schooling with low levels of engagement tend to be more adversely affected by the transition from elementary school to middle school—the point at which some students become disengaged (Eccles et al., 2004). Advances in technology and statistical analysis have provided school districts with tools to track individual students and determine who is at risk for non-completion (Appleton, 2012). Some school districts have begun using instruments, such as the Student Engagement Instrument (SEI; Appleton, Christenson, Kim, & Reschly, 2006) and the Student Engagement Instrument – Elementary Version (SEI-E; Carter et al., 2012) to monitor student engagement over the course of each school year. Fredricks et al. (2011) identified 21 instruments commonly used to assess student engagement. Approximately three of the measures, one being the SEI, can be used for evaluation of intervention efforts, monitoring at the teacher, school and/or district level, and diagnosis and monitoring at the student

level (Fredricks et al., 2011). Ultimately, this enables schools to develop universal and individual interventions for students based upon their unique engagement profiles.

Findings from several studies (e.g., Carter et al., 2012; Holus & Huston, 2012; Roeser et al., 2000) elucidate the appropriateness of measuring student engagement at the elementary and secondary levels. Although the concept of engagement is relatively new, measurement instruments are even more novel (Reschly & Christenson, 2012). Few instruments have been examined in the elementary population. However, as negative outcomes can be predicted as early as first grade (e.g., Alexander et al., 1997), great value exists in measuring and monitoring student engagement levels in the elementary population. Furthermore, as research has shown middle school to be the point at which many students experience downward trends in their engagement (e.g., Eccles et al., 2004), it is critically important that schools have access to measurement instruments that are founded in a theoretical construct and can be used across all levels of schooling (Carter et al., 2012). Having such an instrument will enable school district personnel and researchers alike to examine student engagement trajectories longitudinally.

Purpose of Study

Relatively few longitudinal studies examining student engagement exist. Even fewer studies have longitudinally examined student engagement across the elementary school to middle school transition. As engagement is considered to be a mediator between contexts and outcomes, predictive value exists in analyzing student engagement trends and trajectories across the transition from elementary to middle school. Furthermore, dropout and school completion are long term processes, the roots of which have been shown to begin as early as first grade. Research shows that students who begin school with high levels of engagement maintain stable trajectories of

engagement throughout the course of their educations, while children who start out disaffected become more disengaged over time (Skinner et al, 2008).

The purpose of this study is to examine the predictive utility of student engagement across the elementary to middle school transition. Information yielded from this study could be useful in the detection and intervention of students at risk for disengagement and ultimately, non-completion. This study seeks to answer the following research questions:

1. Does student engagement change following the transition from elementary school to middle school?
2. Is student engagement in the elementary years predictive of students' risk statuses in middle school?

Table 1

Alterable factors
By context

	Protective	Risk
Individual	Complete assignments Prepared for class Expectations for success Internal locus of control	Truancy Behavior problems Grade retention Poor academic performance Special education services
Family	Supportive environment (e.g., quality materials, assistance with homework) Family support for learning (e.g., high expectations, discussions about school completion) Parental supervision	Low expectations Transient Limited access to literacy materials Permissive parenting style
School	Strong teacher-student relationships Supportive school environments (e.g., fair discipline policies, routines, consistency) Small school size (<1,000 students) Effective instruction Mental health support	Few caring relationships High student-teacher ratios Low expectations High rates of absenteeism Peer rejection

Sources: Bellmore (2011); Christenson et al. (2008); Dearing & Tang (2010); Reschly & Christenson (2012); Rumberger (1995)

Chapter Two

Method

Participants

Participants were drawn from an extant dataset collected in a large urban school district in the Southeastern United States. The original dataset included all third through fifth graders who completed the Student Engagement Instrument – Elementary Version in Fall 2011 (N = 4,779). Given that the purpose of this study was to follow students through the middle school transition, fourth and fifth graders in 2011, who were in the sixth and seventh grades in 2013, were retained for analyses (N = 3339). Three hundred thirty-two students were lost over the two years due to mobility or missing data on one or more outcome variables. The final N for analyses was 3007. The sample was 50.3% female; 53.1% qualified for Free or Reduced Lunch, 10.7% and 8.2% of the sample qualified for special education and English Language services, respectively. The ethnically diverse sample was 37.5% White, 27.3% Hispanic, 22.6% Black, and 12.8% Other (Asian, Native American, American Indian, two or more races and Hawaiian/Pacific Islander).

Measures

Student Engagement Instrument and Student Engagement Instrument – Elementary. The SEI and SEI-E yield estimates of students' cognitive and affective student engagement, components of student engagement that are unobservable in nature and therefore, best estimated by self-report measures (Appleton et al, 2008). The instrument is grounded in the four-part typology of student engagement (e.g., behavioral, academic, cognitive, and affective engagement;

Christenson & Anderson, 2002; Appleton et al., 2006, 2008).[1] The SEI's validation sample included 1,940 ninth graders in a diverse school district in the Midwest. Exploratory and confirmatory factor analyses yielded a six-factor model, comprised of affective and cognitive engagement factors. Affective engagement factors included Teacher-Student Relationships, Peer Support for Learning , and Family Support for Learning. Cognitive engagement factors included Control and Relevance of Schoolwork, Future Aspirations and Goals, and Extrinsic Motivation (Appleton et al., 2006). A separate examination of the SEI's factor invariance revealed similar conclusions; strong evidence of the SEI's validity and reliability makes it an appropriate tool to monitor cognitive and affective engagement across the middle- and high- school grades, genders, and students with special education designations (Betts, Appleton, Reschly, Christenson, & Huebner, 2010). However, results from Betts et al. (2010) lent more support for a five-factor model than a six factor model. The sixth factor, Extrinsic Motivation, is therefore typically dropped from research studies but included in school-based applications. Research has also demonstrated the predictive utility of the SEI. For example, an examination of the SEI's validity showed that ninth grade SEI scores were highly predictive of high school completion (Lovelace, Reschly, Appleton, & Lutz, 2014).

Carter et al. (2012) adapted the SEI for the purpose of measuring elementary student engagement (i.e., third through fifth grades). The pilot study sample of the SEI-E consisted of 1,943 students in third through fifth grade, who attended school in a large, diverse, urban school district in the Southeast. Results of the study suggest that four of the five factors on the SEI were applicable to students in grades three through five. Exploratory and confirmatory factor analyses

[1] Previous studies referred to affective engagement as psychological engagement. The current version of the SEI, however, uses the term *affective engagement.*

yielded the following factors: Future Goals and Aspirations, Peer Support for Learning, Teacher-Student Relationship, and Family Support for Learning. Consistent with findings from the original SEI validation study, the SEI-E correlated as expected with other indicators of engagement (e.g., attendance, discipline referrals; Carter, Reschly, Appleton, & Thompson, 2015).

For the purpose of this study, we examined the four factors common to both the SEI and SEI-E (24 items). Moreover, to maintain consistency and account for seasonal decreases in student engagement, we examined student engagement data from fall of 2011, 2012, and 2013. To be included, participants must have completed at least 75% of the items on the SEI/SEI-E (Carter et al., 2012).

At Risk Indicator. We examined the unique contribution of student engagement to a student's sixth grade risk status using the at risk indicator as outlined in Balfanz et al. (2007). Students were considered to be "at risk" if they met the following criteria: 1) absenteeism exceeding 10% of school days; 2) were failing mathematics; 3) were failing English; and, 4) received unsatisfactory behavior mark(s) in quarter 1 or 2. In this study, participants were included if they were at any time deemed to be "at risk" according to the aforementioned criteria.

Attendance. To calculate attendance, the number of days present in school was divided by the total number of school days, and multiplied by 100. Students were flagged as at risk if their attendance rates were less than or equal to 90% of school days, meaning 10% or greater absenteeism.

Behavior. The behavior indicator was flagged as at risk if students received an unsatisfactory behavior mark on their report cards in the first and/or second quarter of the school year. Data from the first half of the school year were utilized, since student engagement data (e.g., SEI and SEI-E) from the fall were analyzed.

Academic Achievement. Scores from the Criterion-Referenced Competency Tests (CRCT) were used as the indicator for academic achievement. The CRCT is a criterion-referenced, standardized assessment, required for students in grades 1-8 attending public schools in the state of Georgia (through the 2013-2014 school year). Students in grades 3-8 are assessed in the areas of reading, English/language arts, mathematics, science, and social studies.
For data analysis purposes, CRCT scores were converted to z-scores, or the statistical measurement of the scores' relationships to the group means. Because historic z-scores for the CRCT were so highly related, the five scores were averaged into a single, historic achievement composite for the logistic regressions in this study.

Data Collection Procedures

The de-identified data in this study were acquired from data collected as part of the school district's monitoring and early intervention efforts. The district collects student SEI data biannually from all students in grades 6-12. Schools may also voluntarily collect SEI-E data; the pilot of the SEI-E has expanded each year. As of the fall of 2014, 26 elementary schools administer the SEI-E. The SEI-E/SEI were administered to whole classes of students in each selected school for three years. That is, data were collected beginning when students were in grades four and five (e.g., Fall 2011) through the present time (i.e., grades 6-7; Fall 2013).

On-site monitors were provided as a resource for survey administrators to ensure fidelity of SEI administration. Both the SEI and the SEI-E were administered orally to control for reading difficulties. Survey administrators and on-site monitors closely supervised students to control for careless responding.

Data Analysis Plan

SEI and SEI-E data were collected from each cohort biannually for three years. The first research question was addressed by the examination of cohort means over time. The second research question addressed the predictive utility of SEI-E scores on students' risk statuses in middle school, therefore, only the fourth and fifth grade cohorts' data were analyzed as the third grade cohort was still in elementary school in the fall of 2013. A series of logistic regressions were used to assess whether student engagement in fourth and fifth grade significantly predicted students' on track or at risk status in sixth or seventh grade. A full model was estimated that included demographic variables (e.g., gender, ethnicity, SES), special education and/or English Learner (EL) status, the achievement composite, SEI/SEI-E data, and the at risk indicator. In simple terms, logistic regressions facilitate the prediction of dichotomous categorical outcomes (e.g., at-risk or not at-risk) based on predictor variables (Field, 2009). In this study, logistic regressions predicted the percentage of students correctly classified into the outcome groups. The resulting statistic is called log-likelihood, or the likelihood of an outcome occurring based upon observed outcomes. The log-likelihood is established on the summation of the probabilities associated with the predicted and observed outcomes, and the resulting value ranges from 0 (the outcome will not occur) to 1 (the outcome will occur; Field, 2009).

To code for ethnicity, each ethnicity was tabulated in relation to a reference group. Gender was dummy coded, such that females were coded as one and males coded as zero. Free and reduced lunch (FRL) was used to approximate poverty in this study, with those eligible for FRL coded as one and ineligible students coded as zero. Special education status was coded as zero if a student was not eligible to receive services, and one if they were. EL status was coded

in a likewise fashion, with students identified as EL coded as one and non-EL students coded as zero.

Chapter 3

Results

Descriptive Statistics

Means and standard deviations for the fourth and fifth grade cohorts' SEI/SEI-E data are presented in Table 2.

The first research question sought to examine whether student engagement changed across the middle school transition. Means for overall scales indicated slight declines, namely for the fifth grade cohort (in seventh grade in 2013). Furthermore, means for subscales did not show appreciable declines in student engagement. The fourth grade cohort transitioned to middle school in Fall 2013 – in some cases engagement went up, stayed the same, or decreased slightly (in the case of TSR). For the 5th grade cohort, fluctuations were observed in the areas of PSL and FSL. Initially, negligible increases were indicated; however, means for both subscales fell in the Fall of 2013 (e.g., seventh grade). Slight declines were indicated in TSR, as means decreased each year that the fifth grade cohort was in middle school, while FGA remained fairly stable.

Table 2

Descriptive Statistics for SEI/SEI-E Overall Scale

Cohort	Fall 2011		Fall 2012		Fall 2013	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Fourth Grade	4.40	0.42	4.42	0.43	4.36	0.43
Fifth Grade	4.35	0.43	4.35	0.42	4.21	0.46

Table 3

Descriptive Statistics for SEI/SEI-E Subscales

Cohort	PSL		TSR		FSL		FGA	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Fourth Grade								
Fall 2011	4.10	.070	4.35	0.56	4.59	0.52	4.69	0.46
Fall 2012	4.13	0.71	4.31	0.57	4.63	0.54	4.77	0.41
Fall 2013	4.19	0.60	4.13	0.64	4.63	0.53	4.76	0.39
Fifth Grade								
Fall 2011	4.06	0.69	4.23	0.61	4.56	0.54	4.74	0.41
Fall 2012	4.18	0.63	4.09	0.66	4.64	0.49	4.78	0.37
Fall 2013	4.15	0.66	3.79	0.73	4.56	0.54	4.74	0.40

Logistic Regressions

A series of logistic regressions were conducted to answer the second research question (How is student engagement in the elementary years predictive of students' risk statuses in middle school?). A list of variables and their descriptions are available in Table 3. In Model 1, the outcome variable--at risk indicator--was modeled as a function of the engagement variables (Family Support for Learning, Future Goals and Aspirations, Peer Support for Learning, Teacher-Student Relationship). Model 2 included the previous variables as well as gender, SES, and ethnicity. Model 3 added EL and SPED eligibility to the aforementioned variables. Finally the historical achievement score was added to Model 4; thus, Model 4 is a complete model of all the predictors together. Logistic regression results for the fourth and fifth grade cohorts are presented in Tables 4 through 7.

Fourth Grade Cohort. The following results are specific to the fourth grade cohort of students, who were in sixth grade at the time of data analysis. In Model 1 (at risk indicator covaried with engagement variables), Peer Support for Learning (z = -2.57, odds ratio = 0.789) and

Future Goals and Aspirations (z = -3.06, odds ratio = 0.639) were significant predictors of students' risk statuses, while Teacher-Student Relationship (z = 0.46, odds ratio = 1.055) and Family Support for Learning (z = -0.22, odds ratio = 0.973) were not.

When demographic variables were covaried with the at risk indicator and engagement variables (Model 2), Peer Support for Learning (z = -2.02, odds ratio = 0.828) and Future Goals and Aspirations (z = -2.30, odds ratio = 0.708) continued to be significant predictors of students' risk statuses at the $p<.05$ level. In addition, FRL eligibility (z = 5.00, odds ratio = 1.950) and African American (z = -2.16, odds ratio = 0.703) and Other (z = -5.31, odds ratio = 0.385) ethnicities predicted increased odds of risk.

In Model 3 (previous variables with the addition of EL and Special Education eligibility), FRL eligibility (z = 4.49, odds ratio = 1.827), Other ethnicity (z = -5.21, odds ratio = 0.391) and ELstatus (z = 3.70, odds ratio = 4.235) all significantly predicted students' 6th grade risk statuses at the $p < 0.001$ significance level. In addition, African American ethnicity (z = -2.04, odds ratio = 0.716), Hispanic ethnicity (z = -2.04, odds ratio = 0.707), and Special Education status (z = 2.45, odds ratio = 1.618) emerged as positive predictors of students' risk statuses at the $p < 0.05$ level of significance. In this model, when engagement variables were covaried with demographic variables and English Learner / Special Education statuses, engagement variables no longer significantly predicted students' risk statuses.

In the final model (Model 4), the aforementioned variables were covaried with an overall, historic achievement composite. Achievement emerged as the strongest predictor of students' risk statuses (z = -7.80, odds ratio = 0.512). FRL eligibility (z = 2.14, odds ratio = 1.365), as well as Hispanic (z = -3.08, odds ratio = 0.571), Other (z = -5.54, odds ratio = 0.345), and African American (z = -3.41, odds ratio = 0.546) ethnicities were also significantly associated with

students' risk statuses in sixth grade. In this model, engagement variables and EL / Special Education eligibility failed to predict students' risk statuses.

Fifth Grade Cohort. The following results are specific to the fifth grade cohort of students, who were in seventh grade at the time of data analysis. In Model 1, none of the engagement variables significantly predicted risk statuses in seventh grade. Of note, both Future Goals and Aspirations ($p = 0.057$) and Peer Support for Learning ($p = 0.077$) approached statistical significance. In Model 2, risk status was significantly associated with gender ($z = -2.58$, odds ratio = 0.739), FRL eligibility ($z = 3.24$, odds ratio = 1.552), and Ethnicity (African American, $z = -2.13$, odds ratio = 0.703; Hispanic, $z = -1.98$, odds ratio = 0.712; Other, $z = -4.90$, odds ratio = 0.416). In Model 3, Gender ($z = -2.26$, odds ratio = 0.766), Free/Reduced Lunch eligibility ($z = 2.96$, odds ratio = 1.499), and Ethnicity (African American, $z = -2.08$, odds ratio = 0.708; Hispanic, $z = -2.27$, odds ratio = 0.674; Other, $z = -4.94$, odds ratio = 0.411) continued to be significant predictors of risk status. In addition, EL ($z = 2.36$, odds ratio = 2.867) and Special Education ($z = -2.05$, odds ratio = 1.566) statuses significantly predicted seventh grade risk status. In the final model (Model 4), Gender ($z = -2.43$, odds ratio = 0.740), Ethnicity (African American, $z = -3.13$, odds ratio = 0.573; Hispanic, $z = -3.70$, odds ratio = -.509; Other, $z = -4.75$, odds ratio = 0.406), and Achievement ($z = -8.58$, odds ratio = 0.467) remained significant predictors of students' risk statuses.

Table 4

Names and Descriptions of Variables

Variable	Description
Covariates	
Female	Gender; participants were coded as 0 for male and 1 for female.
FRL	Free/reduced lunch eligibility
AA	African American
HI	Hispanic
Other	Ethnicities other than African American and Hispanic
EL	English Learner; participants were coded 0 if they were not identified as EL and 1 if they were.
SPED	Special Education; participants were coded 0 if they were not receiving special education services and 1 if they were.
ZCRCT	Historic achievement composite comprised of language arts, reading, mathematics, science, and social studies CRCT scores
Outcome Variable	
ARI	At Risk Indicator; comprised of attendance (<=90%), failing scores on CRCT, unsatisfactory behavior mark in quarters 1 or 2
Engagement Variables	
TSR	Teacher-Student Relationship subscale of the SEI
PSS	Peer Support for Learning subscale of the SEI
FGA	Future Goals and Aspirations subscale of the SEI
FSL	Family Support for Learning subscale of the SEI

Table 5

Logistic Regression Analysis of Risk Status for Fourth Grade Cohort

	Model							
	1		2		3		4	
Variable	z	*p*>|z|	z	*p*>|z|	z	*p*>|z|	z	*p*>|z|
TSR	.046	0.647	0.22	0.822	0.10	0.919	0.53	0.595
PSL	-2.57	0.010*	-2.02	0.044*	-1.89	0.058	-0.64	0.524
FGA	-3.06	.002**	-2.30	0.022*	-1.83	0.067	-1.39	0.165
FSL	-0.22	.822	-0.32	0.752	-0.42	0.673	-0.91	0.365
Gender	---	---	-1.77	0.076	-1.61	0.107	-1.89	0.059
FRL	---	---	5.00	0.000***	4.49	0.000***	2.14	0.032*
AA	---	---	-2.16	0.031*	-2.04	0.041*	-3.41	0.001**
HI	---	---	-1.40	0.161	-2.04	0.041*	-3.08	0.002**
Other	---	---	-5.31	0.000***	-5.21	0.000***	-5.54	0.000***
EL	---	---	---	---	3.70	0.000***	1.91	0.057
SPED	---	---	---	---	2.45	0.014*	0.43	0.668
ZCRCT	---	---	---	---	---	---	-7.80	0.000***

*$p<0.05$
**$p<.0.01$
***$p<.001$

Table 6
Logistic Regression Analysis of Risk Status for Fifth Grade Cohort

	Model							
	1		2		3		4	
Variable	z	*p*>|z|	z	*p*>|z|	z	*p*>|z|	z	*p*>|z|
TSR	0.08	0.937	0.10	0.921	-0.07	0.941	-0.21	0.832
PSL	-1.77	0.077	-1.81	0.070	-1.54	0.123	-0.70	0.484
FGA	-1.91	0.057	-1.21	0.228	-0.97	0.334	0.03	0.975
FSL	0.33	0.745	0.15	0.881	0.13	0.894	0.18	0.858
Female	---	---	-2.58	0.010*	-2.26	0.024*	-2.43	0.015*
FRL	---	---	3.24	0.001**	2.96	0.003*	0.87	0.382
AA	---	---	-2.13	0.033*	-2.08	0.038*	-3.13	0.002**
HI	---	---	-1.98	0.048*	-2.27	0.023*	-3.70	0.000***
Other	---	---	-4.90	0.000***	-4.94	0.000***	-4.75	0.000***
EL	---	---	---	---	2.36	0.018*	0.25	0.800
SPED	---	---	---	---	2.05	0.040*	-0.68	0.496
ZCRCT	---	---	---	---	---	---	-8.58	0.000***

*p<0.05
**p<.0.01
***p<.001

Chapter 4

Discussion and Conclusions

Student engagement has emerged as both a protective factor and a predictor of a range of educational and personal outcomes (Reschly & Christenson, 2012). School completion and dropout can be predicted as early as first grade using indicators of student engagement (Alexander et al., 1997). Moreover, Early Warning Systems have enabled school districts to predict school outcomes with greater accuracy, as early as 6th grade (Balfanz et al., 2007). What is less understood, is the predictive utility of specific student engagement indicators with regard to students being on track for graduation. As most Early Warning Systems lack a comprehensive measure of student engagement, as do previous studies of the variables involved over the elementary- to middle- school transition, further inquiry is warranted.

The purposes of this study were twofold. The first research question sought to examine the change in student engagement following the transition to middle school. Longitudinal data were collected over a period of two years. Variable trends in student engagement were observed. Teacher-Student Relationships was the only area in which slight declines were noted. This finding bolsters conclusions drawn from earlier studies, which found weaker relationships between teachers and students at the middle school level, as compared to teacher-student relationships at the elementary level (Eccles et al.,1993; Midgley, Feldlaufer, & Eccles, 1989; Wang & Eccles, 2012). Little change was observed in FSL and FGA mean scores across the transition from elementary to middle school, while slight increases were indicated for the PSL factor. The latter finding was meaningful, yet unsurprising, given previous research has

demonstrated the increase in importance of peer relationships in middle school (Appleton et al., 2008; Roeser et al., 2000)

The second objective of this study was to examine the predictive utility of the SEI and SEI-E when combined with early warning indicators (e.g., attendance, behavior, and achievement variables), to predict elementary-aged students' likelihood of being on track to graduate. Existing SEI data from fourth and fifth grade cohorts were covaried with risk indicators in sixth and seventh grades, respectively, to determine whether elementary student engagement could accurately predict risk status in middle school. Previous research has demonstrated the predictive validity of attendance, behavior, and course performance in identifying completers and noncompleters with a high degree of accuracy (Balfanz et al., 2007; Mac Iver & Messel, 2013). Therefore, we utilized the indicators of attendance (absences equal to or exceeding 10% of school days), behavior (unsatisfactory behavior marks during the first and/or second quarters), and achievement (failing scores on the CRCTs in sixth and seventh grades). Regressions were run separately for each cohort.

Results from this study expand upon the research base investigating the predictive utility of elementary student engagement data in system-wide early warning systems. The most prominent finding was that Peer Support for Learning and Future Goals and Aspirations were significant predictors of being on track in sixth grade when covaried with demographic variables (e.g., gender, race/ethnicity, and FRL) and the at risk indicator alone (i.e., for the fourth grade cohort). When special education / EL status and achievement scores were added, student engagement variables were no longer predictive. However, they were still meaningful as they remained near our threshold ($p=0.524$ and $p=0.165$). The historic achievement composite and special education eligibility variables may have been so predictive as they were actually earlier

measures of what was included in the at-risk indicator. Finally, student engagement variables were not predictive of being on track for the fifth grade cohort, but remained close to the threshold (p-values ranged from p=.057 to p=0.937). This result was particularly interesting as this group of participants had more middle school influence (e.g., 2 years) than the fourth grade cohort.

Limitations and Future Directions

Overall, this study provides variable support for the inclusion of student engagement indicators in Early Warning Systems, as well as for the predictive utility of elementary student engagement with regard to a student risk statuses in middle school. Student engagement emerged as a strong predictor of students' risk status, before demographic, special education/EL designation, and achievement variables were added. Still, notable limitations exist. Firstly, participants in our study were included if they were ever found to be at risk; therefore, future directions include the analysis of end-of-year risk status.

Another limitation of this study is its lack of geographic representation. Future studies should include data from school districts across the nation, including rural, suburban, and urban districts. Additionally, this study utilized SEI and SEI-E data collected in the fall only. Future studies should include spring scores in their analyses. Finally, future studies should explore additional salient variables to be included with or replace outstanding criteria for the at risk indicator. For example, failing CRCT scores might not be as useful from a prediction standpoint as scores from curriculum-based measures (e.g., Dibels Next) or other standardized, published assessments (e.g., DRA2). Given that the CRCT is a criterion-referenced test, in which an individual either meets the criterion for passing or does not, it may not be as informative an indicator as an individual's reading level, for instance.

In conclusion, both student engagement indicators and early warning indicators serve to identify students at risk for dismal outcomes when there is still time to intervene and change the course. Similarly, both student engagement indicators as well as Early Warning Systems focus on factors that are amenable to change, and therefore serve as points of intervention. It is well documented that early warning signs of disengagement and eventual school withdrawal exist as early as first grade; thus, school districts should start building developmentally appropriate Early Warning Systems, which begin monitoring students across a variety of variables at the onset of their schooling experience (Alexander, Entwisle, & Horsey; 1997). If we have the capability to catch children before they experience failure, we can exponentially increase the likelihood of them staying on the track to success and ultimately, high school graduation.

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