PREDICTING DROPOUT AND UNDERACHIEVEMENT AMONG GIFTED STUDENTS: THE ROLE OF STUDENT ENGAGEMENT

by

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(Under the Direction of Amy Reschly)

ABSTRACT

The issue of high school dropout has long concerned policy makers, educational professionals, and the general public. In the gifted literature, this concern is no less pressing. Student engagement is becoming an increasingly discussed construct for conceptualizing the dropout phenomenon and designing appropriate interventions to prevent this phenomenon. The purpose of this dissertation is two-fold. First, a review of the literature is provided to examine prior findings in the gifted underachievement and dropout literature within the framework of student engagement. Specifically, academic, behavioral, affective, and cognitive indicators of student engagement are examined. Findings of the review and implications for research and practice are presented. Second, an empirical study was conducted to analyze the impact of student engagement on achievement and academic decisions among gifted students. Findings and implications are discussed. Student engagement may prove to be an essential construct in understanding, predicting, and preventing dropout behavior among gifted students.

INDEX WORDS: Gifted students, Dropout, Underachievement, High Achievement, Student Engagement

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DEDICATION

To my beautiful son, Nathan Henry Landis, and my loving husband, Michael Howard Landis. You are the inspiration for everything that I do. Also, to my grandmother, Phyllis Alpert Nordin, who held out as long as she could to see me graduate. I know that you are watching and that you are proud.

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CHAPTER 1

INTRODUCTION

High school dropout is a phenomenon that plagues United States' schools. Recent estimates from the National Center for Education Statistics (Stillwell, 2010) indicate that during the 2007-2008 academic year, approximately 25% of students did not graduate on time. The consequences of leaving high school without graduating are well-documented; individuals without a high school diploma have limited earning potential, and are more likely to live in poverty and experience incarceration than individuals who earn a high school diploma (Bridgeland, DiIulio, & Morison, 2006).

Research regarding high school dropout indicates that some students are at greater risk for dropping out than others. Certain demographic and social risk factors, including low socioeconomic status, ethnic minority status, being male (Rosenthal, 1998), and the presence of a disability (Rumberger, 1995) have been linked to higher rates of dropping out. In particular, students with behavior disorders or learning disabilities are more likely to drop out of high school than their peers in regular education, with a little over half of students with disabilities receiving diplomas in the 2005-2006 academic year (Aud et al., 2010). The increased risk for incomplete high school education among students with disabilities is well known, and increased accountability for improved educational outcomes for students with disabilities over the past decade has brought dropout prevention for this group to the forefront of educational reform (Thurlow, Sinclair, & Johnson, 2002).

In contrast, the dropout phenomenon among students identified as gifted is not as well understood. Estimates of the rates of gifted students dropping out of high school vary depending on a number of factors, including variations in definitions of "gifted" (Matthews, 2006). Two recent attempts to establish prevalence rates of dropout among gifted students using different identification methods resulted in markedly different estimates. For example, Matthews (2006) applied a stringent definition (i.e., measured intelligence or achievement at or above the 95th percentile) and found that under one percent of students identified as gifted dropped out prior to graduation. However, when identification was based both on previous gifted identification and/or participation in three or more advanced courses, approximately five percent of the gifted population could be classified as having dropped out (Renzulli & Park, 2000, 2002). Further, these so-called gifted dropouts accounted for approximately a quarter of the dropout population in Renzulli and Park's (2000, 2002) study. Thus, although high academic achievement is often a factor used in identifying gifted students, a portion of gifted students do choose to leave high school without a diploma.

Research indicates that gifted students drop out for many of the same reasons as their regular education counterparts (i.e., poor attendance, academic problems, lack of belonging, poor relationships with teachers, disciplinary issues, and so forth; Cramond, Kuss, & Nordin, 2007; Matthews, 2006; Renzulli & Park, 2000, 2002); however, there is also evidence that gifted dropouts differ from other dropouts in their reasons for dropping out. For example, Matthews (2006) found that gifted dropouts were three times more likely than non-gifted peers to leave high school in order to pursue a different educational route (e.g., attend a community college, obtain GED credentials). Likewise, whereas some predictors of dropout in the general population, such as parental education, socioeconomic status, plans for college, and pregnancy,

also appear to be appropriate predictors of dropout for gifted students (Renzulli & Park, 2000, 2002), other predictors, such as early poor academic achievement, likely are not. It is therefore critical to examine dropout behavior among gifted students in order to understand how this phenomenon manifests within this group of students.

A number of authors have remarked on the emergence of student engagement as a prominent construct in the literature regarding high school dropout and student achievement (Appleton, Christenson, & Furlong, 2008; Christenson, Sinclair, Lehr, & Hurley, 2000; Reschly & Christenson, 2006a; Sinclair, Christenson, Lehr, & Anderson, 2003). Cumulative research regarding this construct indicates that various indicators of engagement (e.g., participation, attendance, finding school interesting, connection with teachers) can be used to predict later academic outcomes, including high school dropout (Alexander, Entwisle, & Horsey, 1997; Finn & Cox, 1992; Reschly & Christenson, 2006a) and post-secondary outcomes (Finn, 2006). For example, Reschly and Christenson (2006a) found that student engagement significantly predicted later dropout for students with and without disabilities. Similarly, constructs related to engagement, such as goal valuation and motivation, significantly differentiated gifted achievers and underachievers (McCoach & Siegle, 2003). However, no known studies have explored the relationship between various types of student engagement, as conceptualized by Christenson and colleagues (Appleton, Christenson, Kim, & Reschly, 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson, 2006a), and dropout among gifted students.

Although research has yet to explore engagement as it relates to the phenomenon of gifted dropout, existing research provides some illumination of the possible role engagement plays. Gifted students are often identified on the basis of high achievement (Coleman et al., 1994; Oakland & Rosen, 2005), with teacher nominations serving as a common source for

initiating the identification process for gifted students (McBee, 2006; Oakland & Rosen, 2005). Given that students manifesting behaviors of disengagement (e.g., lack of interest, not doing their work) are less likely than their highly engaged peers to demonstrate high achievement or be nominated by teachers as needing gifted services, it stands to reason that many identified gifted students spend their early formal schooling years in optimal engagement conditions. That is, many are likely actively participating and/or achieving in the classroom, which theoretically sets them up to acquire a sense of belonging and continue in a positive cycle of participation and belonging, and subsequently, engagement with school. This cycle is the basis of a seminal model of engagement, the participation-identification (PI) model (Finn, 1989). Yet, in spite of experiencing early success, gifted dropouts discontinue participation and fail to develop, or lose, a sense of belonging at school. When interviewed later about their experiences, some gifted dropouts described feeling disconnected from teachers and peers (Cramond et al., 2007; Hansen & Toso, 2007) and in one study, all 14 gifted dropouts interviewed revealed that emotional disengagement preceded their decision to drop out (Hansen & Toso, 2007).

A more current model of student engagement rooted in prior engagement theory, including Finn's (1989) PI model, and intervention work with students at risk for dropping out, posits that engagement is a multidimensional construct encompassing academic (e.g., on-task behavior), cognitive (e.g., interest in and perceived relevance of school), affective (e.g., sense of belonging, perceived support), and behavioral (e.g., attendance, completing work, behavior) forms (Appleton et al., 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson, 2006a). Examining these forms of engagement and how they contribute to dropout among gifted students can help stakeholders understand why these students veer from

the path of reciprocal participation and identification, where the cycle deteriorates, and how to intervene with students demonstrating risk for dropping out.

Purpose of the Study

The purpose of the present study is to explore the use of the construct of student engagement for understanding and predicting dropout among gifted students. First, Chapter 2 provides a review of the literature regarding dropout and underachievement among gifted students, using Christenson and colleagues' proposed model of engagement as a framework to organize the literature. I make the case that engagement variables are critical and also relevant for understanding why gifted students drop out of high school. Chapter 3 presents a study comparing student engagement among gifted underachievers, high achievers, and non-graduates, and using student engagement to predict dropout and underachievement among gifted students.

CHAPTER 2

STUDY 1:

RE-EXAMINING GIFTED UNDERACHIEVEMENT AND DROPOUT THROUGH THE LENS OF STUDENT ENGAGEMENT

High school dropout is one of the most pressing educational and economic issues in the United States. According to a recent report from National Center for Education Statistics (NCES), 75.5% of students complete high school in four years with a standard diploma. Dropout and completion rates vary as a function of student characteristics, such as race-ethnicity, socioeconomic status, gender, and disability status, as well as region of the country (Chapman, Laird, Ifill, & KewalRamani, 2011). Although much of our collective attention and dropout prevention efforts have focused on those failing to master basic academic skills, a number of educators and scholars have identified a phenomenon of dropout among our most academically exceptional students (Irvine, 1987; Marland, 1972; McClelland, 1985).

Gifted Dropouts

Dropout among those identified as gifted is a puzzling irony for educators. Gifted students, by definition, demonstrate potential for high scholastic achievement [No Child Left Behind Act (NCLB), 2004]. Indeed, a common criterion for gifted identification is scoring at or above the 95th to 97th percentile on a standardized achievement measure (McClain & Pfeiffer, 2012). Thus, when gifted students drop out of high school, they plummet from demonstrating achievement greater than the vast majority of their same-age peers to failing to obtain a minimal

level of formal education. This incongruity between expected and observed outcomes is a source of concern for stakeholders invested in the educational achievement of students

Estimates of gifted dropout vary by study and the operationalization of gifted status (Matthews, 2006). However, the percentage appears to increase as definitions become less rigid. For example, whereas Matthews (2006) found that less than one percent of students participating in a private summer enrichment program requiring achievement or aptitude test scores at or above the 95th percentile dropped out, this number increased to five percent when a larger, more economically diverse group of students were considered gifted (Renzulli & Park, 2000, 2002).

One of the primary reasons dropout is of such great concern in the U.S. is the association between dropping out and poor outcomes in terms of poverty, unemployment, dependence on government assistance programs, and health (Christenson et al., 2000; Rumberger, 1995). Gifted students who drop out experience many of the same negative life outcomes as other dropouts, including reduced earnings and increased need for government assistance (Shaw & Tallent-Runnels, 2007). Moreover, as with other dropouts, the potential these students have to contribute to society is often diminished or lost when they drop out. Research in the general dropout literature indicates that there are promising dropout prevention programs (i.e., What Works Clearinghouse). Given the high aptitude for academics that gifted students exhibit early in their scholastic careers, it stands to reason that intervening with this group has great potential for success. Thus, the importance of bringing gifted students and their curricular, social, and emotional needs into higher prominence in the dropout literature cannot be overstated.

Predictors of Dropout

Risk factors for dropping out are many and varied (see Table 1). The small gifted dropout literature base indicates that gifted students who drop out do so for a number of reasons, many of

which are no different from the reasons expressed by the general population. For example, poor attendance, school failure, dislike of school, drug and alcohol use/abuse, learning disabilities, pregnancy, and family conflict are some of the many factors that have emerged in the research regarding gifted students dropping out of high school (Cramond, Kuss, & Nordin, 2007; Hansen & Toso, 2007; Matthews, 2006; Renzulli & Park, 2000, 2002). These factors have no inherent link to being gifted; attendance difficulties, substance use, parenthood, learning disabilities, and school failure are factors also found in the literature regarding dropout in the general population (Aud et al., 2010; Ou & Reynolds, 2008; Bridgeland, DiIulio, & Morison., 2006; Townsend, Flisher, & Reynolds, 2007).

Another similarity between dropouts in general and those who are gifted is the presence of academic difficulties and underachievement. An important distinction can be made, however, between low achievement and underachievement. Underachievement is defined as a failure to demonstrate academic performance commensurate with potential (Reis & McCoach, 2000) whereas low achievement characterizes performance that falls below grade-level standards and education. Students may underachieve while still meeting grade-level standards. Underachievement appears to be of particular importance in determining dropout risk among gifted students as it appears to precede decisions to drop out of high school. Interviews with high ability students who chose to leave high school without a diploma revealed that most did not put forth their full effort, and some voluntarily chose to take courses that did not provide adequate challenge for them (Cramond et al., 2007). Another study of gifted dropouts revealed that over a third of all dropouts and almost half of male dropouts left school because they were failing (Renzulli & Park, 2000, 2002).

Table 1

Variables Associated with School Dropout

Non-School Correlates*		Protective Factors	Risk Factors **	Demographic and Functional Risk +
SES Minority Group Status Gender (male) Community (e.g., Southern or Western US, single parent families, high numbers of foreign born individuals)	Students	• Complete homework • Come to class prepared • High locus of control • Good self-concept • Expectations for school completion	• High rate of absences • Behavior problems • Poor academic performance • Grade retention • Working	Demographic Risk (SES, disability or English learner status, race-ethnicity, etc.) Functional Risk (e.g., attendance, behavior, academic performance, credits earned, low levels of participation)
Household Stress (e.g., violence, substance abuse, mobility) Early Adult Roles (e.g., pregnancy) Social support for Staying in School (e.g., value of education by parents/peers)	Families	• Academic support (e.g., help with homework) and motivational support (e.g., high expectations, talk to children about school) for learning • Parental monitoring	• Low educational expectations • Mobility • Permissive parenting styles	
Student Involvement with Education (dropouts have lover aspirations, participation etc.) Social Conformity vs. Autonomy (e.g., dropouts higher need for autonomy, less accepting of authority) Social Deviance (e.g., dropouts more likely to participate in deviant behavior)	Schools	• Orderly school environments • Committed, caring teachers • Fair discipline policies	• Weak adult authority • Large school size (>1,000 students) • High pupil-teacher ratios • Few caring relationships between staff and students • Poor or uninteresting curricula • Low expectations and high rates of truancy	

Personality (dropouts lower self-esteem, impulsivity, etc.)	

Notes: Adapted from Reschly and Christenson (2012)
* Rosenthal (1998)
** Reschly and Christenson (2006b)
+ Christenson et al. (2008)

Student Engagement

Within the literature on high school dropout (e.g., Reschly & Christenson, 2006b), distinctions have been drawn between different types of risk factors, including distinctions between factors that lie within the child, home, or school (e.g., Reschly & Christenson, 2006b), factors that alienate students to "push" them out and factors that distract students to "pull" them out (Jordan, McPartland, & Lara, 1999), and factors that are and are not open to intervention (e.g., Finn, 1993). From an intervention standpoint, these distinctions are quite salient. Demographic or status variables are essentially fixed; factors such as ethnicity, socioeconomic status, and primary language spoken in the home are cannot be changed through intervention. In contrast, alterable variables, such as homework completion, parental monitoring, parental support for learning, attendance, and extracurricular participation, are amenable to intervention efforts (Finn, 1993; Reschly & Christenson, 2006b).

Student engagement has emerged as a construct of great interest across scholarly disciplines, such as public health and educational psychology, as well as applied settings (Christenson et al., 2008). Increased interest in this construct appears to be a function of two trends: an emphasis on dropout intervention and prevention efforts that address alterable variables and high school students' general disinterest in school (Appleton, Christenson, &

Furlong, 2008; Fredricks, Blumenfeld, & Paris, 2004). A number of models and definitions have been proffered. Broadly, student engagement refers to students' involvement in and commitment to school (Appleton et al., 2008; Fredricks et al., 2004). There is consensus that engagement is a multidimensional construct that is comprised of some aspects of emotion, behavior, and cognition. Furthermore, engagement is an alterable class of variables that is influenced by contexts (home, school, peers) and associated with important outcomes of interest, including achievement and school completion (Christenson, Reschly, & Wylie, 2012).

Engagement Theory

In a seminal article in the field of engagement, Finn (1989) proposed the Participation-Identification (PI) model to represent the long-term processes leading to dropout or completion. The PI model considers external and internal indicators of involvement in school, participation and identification, respectively, and posits that active participation in school (e.g., doing assignments, responding, paying attention) leads to success in school, which contributes to academic identification, or a sense of belonging and valuing school. Identification induces further participation, creating a positive cycle of engagement (participation → success → identification/belonging → participation). Likewise, a lack of participation, school success, and identification precede eventual physical withdrawal from school: high school dropout (Finn, 1989). Within Finn's (1989) model, participation can occur at varying levels and differs by age, ranging from compliance in younger students, to participation in clubs and activities, to helping with school governance among adolescents. External factors including family support of education, being rejected by the school, and personal situations, can help or hinder a student's degree and level of participation (Finn, 1989).

This model fits the available research on dropout. It is possible to predict dropouts and completers early in elementary school based on such variables as attendance, academic performance, behavior, and attachment to school (.g., Alexander, Entwisle, & Horsey, 1997; Barrington & Hendricks, 1989; Ensminger & Slusarcick, 1992). Other support may be derived from the results of early childhood interventions, which are thought to affect the success of student participation at school entry, facilitating the participation-success-identification cycle (Reschly & Christenson, 2012). Furthermore, it is now widely accepted that dropout is a process of disengagement and withdrawal that occurs over many years. Engagement is also the basis of our most promising interventions to promote school completion (Appleton et al., 2006; Reschly & Christenson, 2006b, 2012). Thus, engagement is thought to be the key variable in understanding, predicting, and preventing high school dropout.

Recent Conceptualizations. The construct of engagement has expanded since Finn's original conception of participation (behavioral) and belonging/identification (affective) as two types of engagement. Many theorists now include a cognitive component (Fredricks et al., 2004; others) and others bifurcate behavioral engagement into two related but separate components: behavioral and academic engagement (Appleton et al., 2006). The model of engagement proposed by Christenson and colleagues posits four subtypes of engagement: academic, behavioral, cognitive, and affective (Appleton et al., 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson 2006a).

Indicators of academic and behavioral engagement are overt, observable, and regularly compiled by school personnel. Time of task, homework completion, and credits earned toward graduation are indicators included in the academic domain (Appleton et al., 2006; Christenson & Anderson, 2002; Reschly & Christenson, 2006a). Behavioral engagement is largely comprised of

physical involvement; that is, attending school, complying with school rules, preparing for class, extracurricular participation, and so forth (Appleton et al., 2006; Christenson & Anderson, 2002; Reschly & Christenson, 2006a). Cognitive and affective engagement, however, are comprised of students' thoughts, perceptions, and attitudes. As such, they are internal to the student and less easily measured, but equally important in terms of student outcomes (Appleton et al., 2006). Cognitive engagement refers to students' interest in and perceived relevance of school as well as self-regulation, and affective engagement (sometimes also referred to as psychological engagement) encompasses a students' sense of belonging and perceived academic support from peers, teachers, and family (Appleton et al., 2006; Christenson & Anderson, 2002; Reschly & Christenson, 2006a).

As noted in a recent volume, scholars have yet to agree on a unifying model or definition of engagement with school (Christenson et al., 2012). After reviewing several theories and recent research on student engagement, Christenson and colleagues (2012) offered the following definition (pp. 816-817):

> Student engagement refers to the student's active participation in academic and co-curricular or school-related activities, and commitment to educational goals and learning. Engaged students find learning meaningful, and are invested in their learning and future. It is a multidimensional construct that consists of behavioral (including academic), cognitive, and affective subtypes. Student engagement drives learning; requires energy and effort; is affected by multiple contextual influences; and can be achieved for all learners.

Research and Intervention

Notwithstanding the various models and definitions of engagement, research consistently supports a connection between student engagement and important outcomes, including academic achievement, health-related behaviors, and social emotional wellness (Christenson et al., 2012). Specific to academics, studies conducted with the National Educational Longitudinal Study (NELS:88) database have found engagement has significant, positive links to academic achievement (Finn, 1993) and enrollment in post-secondary schooling (Finn, 2006), and negative associations to high school dropout (Reschly & Christenson, 2006a).

Beyond its utility in predicting student outcomes, engagement research has important implications for intervening with students at risk for poor educational outcomes. The multidimensional nature of the construct provides multiple targets amenable to intervention, and several scholars have noted that the most promising dropout interventions address student engagement (Christenson et al., 2008; Christenson & Thurlow, 2004; Reschly & Christenson, 2006b). Recommendations for these interventions include promoting engagement through smaller, more personal settings (Dynarski & Gleason, 2002), connections to student choices and interests, support from school personnel (Christenson & Thurlow, 2004; McPartland, 1993) and the availability of counseling, mentoring, and tutoring services (Christenson & Thurlow, 2004). Engagement also underlies the few programs identified as having positive or potentially positive effects through the Institute of Education Sciences What Works Clearinghouse (http://ies.ed.gov/ncee/wwc/). For example, the Check & Connect Dropout Prevention Model addresses various engagement components through promoting the importance of school (cognitive engagement), meaningful relationships with school-related adults (affective engagement), and assistance with enrollment and transportation (behavioral and academic

engagement), as well as other important intervention components (Sinclair, Christenson, Lehr, & Anderson, 2003; Sinclair et al., 2005). The Check & Connect model is supported by research, and participation in the program is linked to improved academic and behavioral engagement (Anderson, Christenson, Sinclair, & Lehr, 2004) and rates of high school completion (Sinclair, Christenson, Evelo, & Hurley, 1998; Sinclair et al., 2005).

Given the clear connection between student engagement and later outcomes, including high school dropout, as well as its promise for intervention, engagement may prove to be an essential construct for understanding and preventing dropout among gifted students as well. Whereas certain status predictors of dropout, such as low scholastic achievement and grade retention, are unlikely to identify potential gifted dropouts, particularly early in their school careers, engagement may prove to be a better predictor for gifted students. This statement should not be taken to imply that gifted students do not struggle in school, demonstrate low achievement and inappropriate behavior, or perform at levels requiring retention. It is widely recognized that gifted students may be subject to a number of barriers to their achievement (e.g., twice exceptionality, poor achievement motivation; Seeley, 2004). However, gifted students are typically identified on the basis of high achievement (McClain & Pfeiffer, 2012), making early low achievement a poor marker of risk for them. In this same vein, it is unlikely that gifted students drop out because the coursework is too difficult. Engagement may be one of the few alterable variables that can effectively prevent dropout and is open to intervention for gifted students.

The purpose of this review is to re-examine prior research regarding dropout among gifted students, using student engagement theory as an organizing framework. In his study on gifted dropout, Matthews (2006) reviewed underachievement literature in order to “broaden the

scope of discussion" about gifted dropouts (p. 217). As underachievement is often a precursor to dropout (Bridgeland, DiIulio, & Morison, 2006; Cramond et al., 2007; Renzulli & Park, 2000, 2002) and a commonly discussed phenomenon in the field of gifted education, Matthews' (2006) approach is used in this review, and studies from the gifted underachievement literature that explored themes relevant to engagement will also be reviewed. The four-pronged definition of engagement discussed by Christenson and colleagues is an ideal model for this purpose. With four hypothesized indicators of engagement, this model is comprehensive and provides excellent coverage of the construct. Moreover, with the advent of measurement instruments grounded in this theory (i.e., the Student Engagement Instrument, Appleton et al., 2006), student engagement, as delineated above, is readily measurable. In this next section, findings from various studies regarding gifted dropout and underachievement are presented within a four-pronged engagement paradigm.

Reviewing the literature in this way provides a new perspective on gifted dropout and underachievement. Re-organizing the findings within the context of student engagement goes beyond the previous tradition of describing these phenomena and their correlates and addresses potential underlying variables. It also connects these two phenomena by highlighting a variable that may lead underachieving students to eventually drop out. Additionally, this approach aligns the gifted dropout literature with trends in the research on dropout in the general population. This approach may allow for new insight in preventing and remediating underachievement and preventing dropout among gifted students.

The literature search for articles about gifted underachievement and dropout was guided by two parameters. First, the review was restricted to articles that presented data. Thus, literature reviews and opinion pieces were not included. Second, the review was limited to articles that

addressed student perceptions and behaviors, as these are components of student engagement. Within these parameters, 12 studies were identified for review. Six of these studies dealt with high school dropout and six dealt with underachievement. Pertinent information regarding these studies, including the study methodology, means of gifted identification, and engagement indicators identified, is summarized in Table 2.

Table 2

Studies Reviewed

Study Citation	Research Focus (Dropout or Underachievement)	Methodology	Gifted Identification parameters	Engagement Variables Evident in the Study			
				Academic	Behavioral	Affective	Cognitive
Baker, Bridger, & Evans (1998)	Underachievement	Quantitative	Identification as gifted by school district (academic or cognitive standardized test scores at or above the 90th percentile)		✓		
Baslanti & McCoach (2006)	Underachievement	Quantitative	Students selected to attend a prestigious university (usually requiring scores at the 95th percentile or above on an entrance exam)	✓			✓
Colangelo, Kerr, Christenson & Maxey (1993)	Underachievement	Quantitative	Scoring at or above the 95th percentile on the American College Testing Program (ACT)		✓		✓
Cramond, Kuss, & Nordin (2007)	Dropout	Mixed Methods	Previous identification for gifted program or school personnel recommendation	✓	✓	✓	✓

Hansen & Toso (2007)	Dropout	Qualitative	Previous identification for gifted program, "significantly above-average test scores" (p. 33), or recommendation from school personnel			✓	✓
Hébert (2001)	Underachievement	Qualitative	Academic or cognitive standardized test scores above the 85th percentile	✓	✓	✓	✓
Kanevsky & Keighley (2003)	Underachievement and Dropout	Qualitative	Previous gifted identification (elementary school)		✓	✓	✓
Matthews (2006)	Dropout	Quantitative	Participation in the Duke University Talent Identification Program (requiring academic or cognitive standardized test scores at or above the 95th percentile)		✓		
McCoach & Siegle (2003)	Underachievement	Quantitative	Academic or cognitive standardized test scores at or above the 92nd percentile	✓			✓
Peterson (2001)	Underachievement	Mixed methods	Self-identification as "high-ability" (90th-95th percentile)		✓	✓	✓
Renzulli & Park (2000,2002)	Dropout	Quantitative	Previous gifted identification or enrollment in three or more honors/advanced level courses			✓	
Seeley (1988)	Dropout	Qualitative	Not available			✓	✓

Gifted Dropouts and Student Engagement

Similar to literature concerning general high school dropout, student engagement, or a lack thereof, is an underlying theme in much of the literature regarding underachievement and dropout among gifted students. Summarizing interviews with gifted students who dropped out of high school, Hansen and Toso (2007) noted, "All dropouts admitted they emotionally gave up at school long before they dropped out" (p. 38). Indeed, research indicates that gifted students who drop out can trace their frustration with school to their elementary school years (Cramond et al., 2007; Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). Gifted dropouts, like most dropouts, appear to undergo a process of emotionally, cognitively, and behaviorally disengaging from school before they drop out (c.f., Finn, 1989). Findings from the literature are discussed below and summarized in Tables 3, 4, 5, and 6 for academic, behavioral, affective, and cognitive engagement, respectively.

Academic Engagement

As mentioned above, Christenson and colleagues' model of student engagement suggests a distinction between behavioral and academic engagement, partitioning indicators such as time on-task, completion of homework, and credit hours into the category of academic engagement (Appleton et al., 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson, 2006a). The relationships between academic engagement and outcomes such as dropout and achievement are well-substantiated. Spending more time engaged in academic tasks is associated with higher academic achievement across studies (DiPerna, Volpe, & Elliott, 2002, 2005; Hughes, Luo, Kwok, & Lloyd, 2008; Singh, Granville, & Dika, 2002). Academic achievement, subsequently, is associated with high school dropout, with dropouts demonstrating lower rates of achievement than their graduating counterparts (Hess, Lyons, Corsino, & Wells,

1989; Hickman, Bartholomew, Mathwig, & Heinrich, 2008). Likewise, the completion of assignments is significantly associated with achievement outcomes; students who demonstrate higher rates of assignment completion showed more favorable achievement outcomes (Finn, 1993; Finn & Cox, 1992). Without sufficient credit hours, students are less likely to graduate (Neild & Balfanz, 2006) and failure to accrue necessary credit hours may lead to grade retention, which significantly raises the odds that a student will drop out of high school (Jimerson & Ferguson, 2007; Reschly & Christenson, 2006a). Although these indicators are discussed separately, it is understood that they are related entities; failure to participate, pay attention, and complete class assignments is likely to produce failing grades, which leads to lost credit hours.

Academic Engagement and Gifted Underachievement and Dropout

Indicators of academic engagement (i.e., time on-task, homework completion, and credit hour accrual) are evident in the literature on gifted underachievement and dropout as well as the general literature (e.g., DiPerna et al., 2002, 2005; Hughes et al., 2008; Singh et al., 2002). Although time spent on-task was not directly measured in any of the studies the reviewed, research indicates that gifted students who underachieve and/or dropout are often not on-task in the classroom. For example, Cramond et al. (2007) conducted a study of high ability students who chose to drop out of high school. Participants in the study were selected based on their previous identification for gifted programming and their decision to leave high school without a diploma. Thirteen students were interviewed about their school experiences and reasons for dropping out of high school. One of the themes mentioned by several participants was their lack of participation in classes. Some students described sleeping through classes, others discussed simply not paying attention. Similarly, participants in Hébert's (2001) qualitative study of six

underachieving gifted high school students also reported off-task behavior during classes, including sleeping through classes, not responding in class, and "'fool[ing] around'" (p. 184).

Completion of homework, a second indicator of academic engagement, appears to be a struggle for many gifted students who underachieve and/or choose to leave high school. In a study of 178 gifted high school students, classified as "achievers" or "underachievers" based on high ability and earned grade point average, McCoach and Siegle (2003) found two scales on an overall measure of students' school attitudes that significantly predicted group membership (i.e., achiever or underachiever). One of these scales, Motivation/Self Regulation, included items referring to students' completion of schoolwork. Students who were achieving below expectations were less likely to report completing and expending effort on schoolwork (McCoach & Siegle, 2003). These findings were replicated in a second study of college undergraduates using the same measure of student attitudes (Baslanti & McCoach, 2006). Likewise, underachieving students in Hébert's (2001) study failed to complete class and homework assignments, reporting that they did not need to complete tasks comprised of material that came easily to them. Cramond et al.'s (2007) findings with gifted dropouts mirrored those of Hébert (2001) and McCoach and Siegle (2003); a number of students simply stopped turning in their homework.

Similar to time spent on-task, credit hours earned toward high school completion were not directly measured in any of the studies reviewed. However, this indicator can be inferred from other findings reported in the literature. In both Cramond et al.'s (2007) and Hébert's (2001) studies, students discussed not receiving credit for courses, either as a result of failing the course or exceeding the number of accepted absences. For several participants in Cramond et al.'s (2007) study, losing course credit was a critical determinant in their decision to leave high

school. Studies in the gifted literature indicate that this component of academic engagement, as well as assignment completion and time spent on-task, is low among gifted underachievers and dropouts.

Table 3

Academic Engagement

Indicators from Christenson and colleagues	Indicators in the Gifted Underachievement/Dropout Literature
Time on task	• Sleeping through classes • Not attending
Credit hours	• Inadequate credit hours due to course failure or exceeding accepted absences
Homework completion	• Low effort and work completion • Failing to turn in homework

From Landis & Reschly (2011)

Behavioral Engagement

Behavioral engagement is the most robust of the four engagement subtypes in predicting student outcomes, and indicators of this subtype (attendance, truancy, preparation for school, participation in extracurricular activities, and discipline referrals, Appleton et al., 2006; Christenson et al., 2008; Reschly & Christenson, 2006a), are perhaps the most evident, particularly when a student is exhibiting low engagement (Christenson et al., 2008). Research has demonstrated a strong link between behavioral engagement and academic achievement. Middle school students with high attendance and low truancy demonstrated significantly higher achievement scores in reading, math, social studies, and science (Finn, 1993). Moreover, among

students classified as at-risk based on status variables, including socioeconomic status, minority status, and language minority status, those who scored above average on national tests of reading and math achievement were more likely to exhibit behaviors such as extracurricular involvement, preparation for class, and regular attendance (Finn, 1993). The relationship between extracurricular involvement and achievement is evident as early as elementary school (Dumais, 2006), and is related to a number of other academic and general indicators of student well-being, including high school completion, health-related behaviors, and personal adjustment (Feldman & Matjasko, 2005). However, some data suggest that achievement actually precedes extracurricular involvement, rather than vice versa (i.e., Hunt, 2005). Overall, the students demonstrating desirable achievement are also behaviorally engaged (Finn, 1993).

The impact of behavioral engagement spans a student's academic career. Indeed, Finn and Cox (1992) claimed, "If a youngster does not become involved in learning activities in the first two or three grades … it is highly unlikely that he or she will become involved in later grades" (p. 159). Students who demonstrated less attention and effort in fourth grade also had lower achievement in first through third grade than their behaviorally engaged counterparts (Finn & Cox, 1992); likewise behavioral engagement in early elementary school has been predictive of later academic achievement and dropout decisions (Alexander, Entwisle, & Horsey, 1997). Further, in Finn's (2006) longitudinal study of students at risk, behavioral engagement in high school was related to completion of postsecondary school and employment outcomes. The behaviors encompassed in behavioral engagement appear vital to academic and life success.

High school completion is also significantly associated with behavioral engagement (Finn, 2006), and behavioral engagement has consistently proved to be the strongest of the engagement subtypes in predicting dropout (Archambault, Janosz, Fallu, & Pagani, 2009;

Reschly & Christenson, 2006a). For example, school attendance is one of the best predictors of high school completion (Ou & Reynolds, 2008; Reschly & Christenson, 2006a). When Reschly and Christenson (2006a) examined student engagement as a predictor of later high school dropout in a large national sample of students with and without disabilities (i.e., learning disabilities, emotional and behavior disorders, or both), they found evidence for the importance of attendance as well as other indicators of behavioral engagement for high school completion. These indicators (including attendance, skipping class, and misbehavior, among others) not only significantly differentiated students with and without disabilities, but also improved the prediction of dropout among students with disabilities beyond what could be predicted by grade retention, socioeconomic status, and math and reading achievement (Reschly & Christenson, 2006a). Similarly, Archambault et al. (2009) also studied student engagement in large group of adolescents, ranging in age from 12 to 16, and sought to determine how well engagement predicted high school dropout two years later. They found that behavioral engagement significantly predicted later dropout with maternal education, age, and grade retention covaried, accounting for 12% of the variance in high school dropout. Overall, behavioral engagement appears to be an important factor in student achievement and secondary outcomes.

Behavioral Engagement and Gifted Underachievement and Dropout

Behavioral engagement also is quite relevant when applied to gifted students who drop out of high school and/or underachieve in school. Attendance and behavior problems were issues reported across studies. In interviews with underachieving gifted high school students who had at some point left school, either because of suspension or dropping out, Kanevsky and Keighley (2003) reported that skipping class was a commonplace practice among the participants; however, they did so strategically, skipping infrequently enough to stay within the schools'

attendance guidelines. In Cramond et al.'s (2007) study, most students reported skipping class and being subject to disciplinary action as a result. Among a group of students who had previously participated in a competitive academic enrichment program for seventh grade students, almost half of the students who eventually dropped out of high school reported that attendance problems prompted their decision to leave school (Matthews, 2006). In terms of behavior problems, several of the students in Cramond et al.'s (2007) study were disciplined by the school behaving inappropriately and missing class. Behavior was a significant issue for most of the underachieving participants in Hébert's (2001) study as well, and behavioral offenses included skipping class and fighting.

Extracurricular involvement, another indicator of behavioral engagement, also appears low among gifted students who underachieve and/or drop out of high school. Few of the gifted dropouts in Cramond et al.'s (2007) study participated in extracurricular activities. Likewise, in a study comparing low and high achieving high-ability high school students, Colangelo, Kerr, Christensen, and Maxey (1993) found that students classified as underachievers reported less extracurricular involvement than those classified as high achievers. In contrast, most retrospective reports from another group of underachievers reflected some form of extracurricular involvement during high school (Peterson, 2001). Notably, this group was comprised of previous underachievers who later re-applied their efforts to academic tasks. That is, they reverted to high achievement after a period of underachievement.

Another finding from Colangelo et al.'s (1993) study that reflects the importance of behavioral engagement relates to student preparation. The majority of underachieving, high-ability students reported needing assistance with study skills, compared to only 15% of high-ability, achieving students (Colangelo et al., 1993). Similar findings were reported by Baker,

Bridger, and Evans (1998). In a study of 56 gifted elementary and middle school students, approximately equally divided into achievers and underachievers, these authors examined individual, family, and school related factors that distinguished between achievers and underachievers. Inadequate study skills were a significant predictor of group membership, both in a model including only individual factors and a full model incorporating individual, family, and school factors (Baker et al., 1998). Evidently, low extracurricular involvement and failure to adequately prepare for school demands, as well as poor attendance and misbehavior, are salient factors for gifted underachievers and dropouts.

Table 4

Behavioral Engagement

Indicators from Christenson and colleagues	Indicators in the Gifted Underachievement/Dropout Literature
Attendance/Truancy	• Skipping class • Attendance problems
In-class participation and preparation	• Inadequate study skills • Sleeping in class
Extracurricular activity participation	• In most cases, low extracurricular involvement • One study in which extracurricular involvement was high
Discipline referrals	• Discipline for inappropriate behavior, including skipping class and fighting

From Landis and Reschly (2011)

Affective Engagement

Within Christenson and colleagues' framework of student engagement, affective engagement refers to a sense of belonging at school (Appleton et al., 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson, 2006a). Student perceptions of their relationships with teachers and support for learning from peers and parents are indicators of this construct (Appleton et al., 2006). Evidence supporting a relationship between affective engagement and student outcomes is less straightforward than that of academic and behavioral engagement. Although perceived support from parents and teachers has been linked to achievement (Finn, 1993) and academic effort (Wentzel, 1997), respectively, findings regarding affective engagement and dropout have not supported a significant relationship. Reschly and Christenson's (2006a) and Archambault et al.'s (2009) findings revealed that affective engagement added little predictive value to models of high school dropout after other relevant covariates and behavioral engagement had been taken into account. Notably, Archambault et al.'s (2009) definition of affective engagement relied on liking and showing an interest in school (indicators which would be classified as cognitive engagement within Christenson and colleagues' framework), whereas Reschly and Christenson (2006a) focused on student's perceptions of warmth and interactions with teachers. In spite of non-significant findings, both sets of authors suggested alternative pathways of operation for affective engagement in which affective engagement relates to behavioral engagement, which relates to high school dropout (Archambault et al., 2009; Reschly & Christenson, 2006a). Findings from a study conducted by Furrer and Skinner (2003) provide partial support for this hypothesis; they found that students' "sense of relatedness" (i.e., "feeling special and important," p. 149) to teachers, parents, and age-mates were related to behavioral engagement and interest in school, which was, in turn, related to

performance. Moreover, students' perceptions of school warmth decreased the likelihood of dropping out in students with and without disabilities (Reschly & Christenson, 2006a). Thus, affective engagement plays an important role in predicting student outcomes, but the nature of this role is not entirely realized.

In addition to academic outcomes, components of affective engagement are related to other important student outcomes. In a large national study including over 12,000 adolescent students, Resnick et al. (1997) found that the higher students' perceived closeness with family members and school personnel and sense of belonging at school, the less likely they were to engage in risky health behaviors such as violence, substance use, and suicidal behavior. Similarly, You, Furlong, Felix, Sharkey, & Tanigawa (2008) found that these same school factors, labeled school connectedness, were related to feelings of hope (i.e., feeling one is capable of solving problems and doing well) and general life satisfaction for non-bullied students. As Resnick et al. (1997) noted, "social context counts" (p. 830).

Affective Engagement and Gifted Underachievement and Dropout

Teacher, peer, and parental support all appear to be important factors for gifted students who underachieve and/or drop out of high school. Negative perceptions of teacher-student relationships emerged across studies of gifted dropouts. For example, in a qualitative study of 14 gifted young adults who had dropped out high school, Hansen and Toso (2007) found that many of the students interviewed conveyed a sense of not being respected by or cared about by school personnel. Cramond et al.'s (2007) findings were similar; students believed that no one at the school cared if they dropped out. Notably, many also discussed close, respectful relationships with at least one teacher, which they described as important to them (Cramond et al., 2007). Keighley and Kanevsky's (2003) participants also described both teachers they characterized as

uncaring and those they believed were caring; similar to students in Cramond et al.'s (2007), all described one or more caring teachers in their school experiences. Renzulli and Park's (2000, 2002) research also revealed unfavorable teacher-student relationships. In a two-part study, these authors identified previously high-achieving students who had dropped out of high school by their senior year. Among the many reasons these students gave for leaving school, an inability to get along with teachers was endorsed by almost a third of male participants. Moreover, about one-fifth of all gifted dropouts reported leaving because they "felt [they] didn't belong at school" (Renzulli & Park, 2000, p. 265, 2002). Finally, Seeley (2004) cited his own 1988 study in which 128 gifted students who had dropped out were interviewed about their experience. "Teacher indifference or hostility" was among the reasons students cited for dropping out (p. 4). Unfortunately, the original study (Seeley, 1988) was unavailable through electronic search, and further information could not be obtained.

Gifted students who underachieve also report poor teacher-student relationships. For example, Peterson (2001) gathered information about the experiences of 31 self-identified gifted underachievers. These participants were all educators, ranging in age from 22 to 53, and all had experienced underachievement in high school, but had achieved academic success in college or graduate school. The vast majority had earned graduate degrees. Although most participants reported receiving feedback from teachers on their work, many participants also perceived that their teachers were indifferent to their academic performance (Peterson, 2001).

Regarding support from peers, gifted underachievers and dropouts appear to have a number of negative experiences. Among gifted dropouts, many felt they did not fit in with their peers at school (Cramond et al., 2007; Hansen & Toso, 2007; Seeley, 1988, as cited in Seeley, 2004). Some of the participants in Cramond et al.'s (2007) study reported feeling emotionally out

of sync with their age-mates, who they felt had trivial concerns. A number of gifted dropouts also had close friends who had also dropped out (Cramond et al., 2007) and friends who engaged in alcohol and drug use (Hansen & Toso, 2007). Peer support for learning and achieving was apparently low for these students. Similarly, reports from gifted underachievers also indicate affiliation with peers who did not support achievement or learning. Peers who encouraged these students to skip class and socialize rather than study and participate in class likely contributed to their underachievement in high school (Hébert, 2001; Peterson, 2001).

Finally, the degree to which parents provided support for learning appears to be favorable for gifted underachievers and dropouts. The participants in Hansen and Toso's (2007) study reported having advocates in their parents. Although many reported fighting with their parents over their decision to drop out, parents encouraged them to remain in school and pursue their education (Hansen & Toso, 2007). Similarly, the majority of parents of gifted dropouts in Renzulli and Park's (2000, 2002) study were upset over their child leaving school and tried to convince them to remain in school. These parents expected their children to achieve a post-secondary level of education (Renzulli & Park, 2002). However, a third or less of parents took action (i.e., helping with work, calling school personnel, arranging for tutoring) to assist their children in completing school (Renzulli & Park, 2000, 2002). Thus, although parents supported learning through the messages they verbally sent their children, few provided additional assistance to aid their children in completing high school.

Although most of the literature reflects the finding that gifted students perceived support from their parents, gifted underachievers in Peterson's (2001) study perceived that their parents cared little about their learning. These students reported that parents gave little response to their achievements and appeared indifferent. However, it is notable that only about a third of these

individuals reported no encouragement from either parent for achievement, indicating that the majority received some parental support, if not the degree of recognition they might have desired. Overall, support from parents and teachers was evident in the reports from gifted dropouts and underachievers, in varying forms.

Table 5

Affective Engagement

Indicators from Christenson and colleagues	**Indicators in the Gifted Underachievement/Dropout Literature**
Perceived relationships with teachers	• Lack of respect or caring from teachers • Some studies in which students also cited a close caring relationship with one teacher
Perceived support from peers	• Poor peer models • Sense of not belonging at school or fitting in with peers
Perceived support from family	• Parents perceived as advocates • Parents held high expectations for students' educational future • One study in which students perceived a lack of support

From Landis and Reschly (2011)

Cognitive Engagement

Within Christenson and colleagues' framework of engagement, cognitive engagement refers to the personal value students place in school. This construct includes the goals and aspirations students have for their future and the relevance they perceive their school work has for those goals (Appleton et al., 2006; Christenson et al., 2008). Additionally, degree of boredom

in school and use of self-regulated learning strategies have also been included in this domain as well as the time and effort students are willing to expend in academic pursuits (Appleton et al., 2006; Archambault et al.,2009; Fredricks et al., 2004; Reschly & Christenson, 2006a).

Like affective engagement, the relationship between cognitive engagement and student outcomes is equivocal. Although Reschly and Christenson (2006a) found that reported student boredom increased the likelihood that students would drop out and perceived relevance decreased this likelihood for some students, measures of cognitive engagement did not significantly contribute to the prediction of high school dropout when other covariates and behavioral engagement were taken into account. This finding was replicated by Archambault et al. (2009). It was suggested that cognitive engagement, like affective engagement, influences behavioral engagement, indirectly influencing dropout (Archambault et al, 2009; Reschly & Christenson, 2006a). Consistent with this hypothesis, Lovelace, Reschly, Appleton and Lutz (2012) found that students who were exhibiting low levels of behavioral engagement (e.g., high rates of absences and discipline referrals) were more likely to report low cognitive and affective engagement (i.e., at or below the 5^{th} percentile). Moreover, students reporting low cognitive and affective engagement were more likely to drop out. The inverse was true for highly cognitively and affectively engaged students; they were less likely to demonstrate low behavioral engagement and drop out (Lovelace et al., 2012).

Despite the indefinite relationship between cognitive engagement and dropout, cognitive engagement appears to have a more robust relationship with academic achievement. Students with low cognitive (and affective) engagement were more likely to fail state achievement tests in Lovelace et al.'s (2012) study. Similarly, Finn (1993) found that the degree to which students

valued learning was higher in adequately achieving and high-achieving students than low-achieving students.

A recent study that focused solely on the relationship of cognitive engagement and academic achievement, with other forms of engagement controlled, revealed that certain aspects of the construct may be more influential than others. Using the Student Engagement Instrument (SEI) to measure to cognitive and affective engagement, Spanjers (2007) found that two cognitive engagement subscales of the SEI, Future Aspirations and Goals and Control and Relevance of Schoolwork, significantly predicted achievement. Interestingly, the Future Aspirations and Goals subscale was positively related to achievement, whereas Control and Relevance of Schoolwork had a negative association. The latter finding was puzzling, but consistent with Appleton et al.'s (2006) study, in which the Control and Relevance of Schoolwork subscale was also negatively correlated with achievement and positively correlated with school suspensions. Appleton et al. (2006) attributed the former finding to students' perceiving schoolwork as irrelevant to their larger goals and/or inconsistencies between students' knowledge and what is tested on national achievement tests. The latter finding was hypothesized to be a "methodological artifact" (Appleton et al., 2006, p. 440).

In sum, cognitive engagement appears to have an impact on academic achievement, but its relationship to dropping out is less definitive. As such, cognitive engagement may relate to dropping through its relationship with other factors (i.e., academic achievement, behavioral engagement), as suggested by Reschly and Christenson (2006a).

Cognitive Engagement and Gifted Underachievement and Dropout

Among gifted dropouts and underachievers, indicators of cognitive disengagement are extensive. Boredom was a prominent theme for students in Cramond et al. (2007), Hansen and

Toso's (2007), Hébert's (2001), Kanevsky and Keighley's (2003) studies. Tedious and unchallenging schoolwork was also cited in Seeley's (1988, as cited in Seeley, 2004) study. The literature reveals that many gifted underachievers and dropouts take courses that are not appropriate to their instructional needs, either by choice or as a result of their underachievement. Gifted dropouts in two separate studies described the lack of challenge they encountered in non-advanced high school courses, which they felt required them to do irrelevant busy work (Cramond et al., 2007; Hansen & Toso, 2007). Students from Cramond et al.'s (2007) study remarked on the apathy of students in their general education courses, and the negative effect these students' apathy had on them. Similarly, the gifted underachievers in Hébert's (2001) study described a poor match between their abilities and their coursework and frustration with assignments they perceived to be meaningless and below their ability level. The theme of frustration with and intolerance for monotonous, mentally un-stimulating schoolwork was also evident for the underachieving students in Kanevsky and Keighley's (2003) study, and these students responded to boredom by choosing to neglect their schoolwork. Finally, goal valuation, or the importance one attaches to scholastic achievement, was a significant predictor of gifted students' status as an achiever or underachiever in one study of underachievement (McCoach & Siegle, 2003). It is notable that in this particular study, the average rating given to items assessing goals valuation still fell in the mildly positive range for underachieving students and goal valuation was not a significant predictor of underachiever status in a study of undergraduates (Baslanti & McCoach, 2006). Overall, gifted underachievers and dropouts perceived little value in their schoolwork and were often bored in school.

Future aspirations appear to be a source of uncertainty for many gifted students who underachieve and/or drop out. Some of the gifted dropouts in Cramond et al.'s (2007) study were

uncertain about their career aspirations. Similarly, Peterson (2001) found that many of the gifted individuals who had once underachieved did not have a clear sense of their future aspirations and goals until later in life. However, it is notable that all of these participants went to college, indicating they recognized the necessity of education in realizing later goals. Finally, in their study comparing achieving and underachieving gifted students, Colangelo et al. (1993) found that students who were underachieving were significantly less likely than their achieving counterparts to aspire to enroll in honors courses or degrees beyond college.

Table 6

Cognitive Engagement

Indicators from Christenson and colleagues	Indicators in the Gifted Underachievement/Dropout Literature
Goals and aspirations	• Uncertain career aspirations • Lower future aspirations
Perceived relevance of school/interest	• Boredom • Irrelevant, unchallenging school work
Self-regulated learning strategies	• Low self-regulation, poor time management

From Landis and Reschly (2011)

Discussion

Each year, a portion of the nation's high school student body chooses to leave school without completing their degree program. Based on prior research, it is estimated that as many as a quarter of these students were previously high-achieving (Renzulli & Park, 2000, 2002). Understanding the reasons that gifted students choose to drop out of high school is an important

endeavor for educators, administrators, and researchers. Student engagement is an increasingly researched topic in the literature regarding high school dropout (Christenson et al., 2008; Christenson et al., 2000; Reschly & Christenson, 2006a; Sinclair et al., 2003) and may have important implications for identifying gifted students at-risk for future underachievement and dropout and intervening for students at-risk for adverse educational outcomes.

This review of the literature indicates that student engagement, incorporating academic, behavioral, affective, and cognitive components (Appleton et al., 2006; Christenson & Anderson, 2002; Christenson et al., 2008; Reschly & Christenson, 2006a), is a highly relevant theme in the school experiences of gifted students who underachieve and/or dropout. Cumulatively, the literature indicates that gifted underachievers and dropouts are not academically engaged. They are seldom on-task, choosing to sleep through classes or engage in otherwise off-task behavior (Cramond et al., 2007; Hébert, 2001). Less effort is put into homework and class assignments, and some students fall off-track in terms of course credit, due to absences or insufficient effort (Cramond et al., 2007; Hébert, 2001; McCoach & Siegle, 2003). Likewise, behavioral engagement also appears to be minimal in gifted dropouts and underachievers. Missing class, as well as attendance and behavior problems are consistent themes in the literature reviewed. The findings regarding extracurricular involvement and dropout among gifted students were equivocal. Interestingly, in Peterson's (2001) study, where past underachievers reported involvement in various extracurricular activities, the participants went on to college and most completed graduate degrees. Thus, it may be that having some form of behavioral engagement was influential in these participants reversing their underachievement. Finally, self-reported inadequate study skills (e.g., Baker et al., 1998; Colangelo et al., 1993) provide an indirect measure of poor preparation for class.

Overall, the evidence for affective engagement among gifted dropouts and underachievers is mixed. In contrast with engagement theory, not all aspects of affective engagement were universally poor for gifted dropouts and underachievers. Consistent with theory and research in the general population, peer affiliation was often not optimal for learning; gifted underachievers and dropouts spent time with peers who had also dropped out, used illegal drugs and alcohol, and encouraged them to skip class and underachieve (Cramond et al., 2007; Hansen & Toso, 2007; Hébert, 2001; Peterson, 2001). Not fitting in at school was a concern for some students (Cramond et al., 2007; Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). Relationships with parents and teachers, however, did not always follow engagement theory and research. Although many studies revealed a perceived lack of caring from teachers and school personnel, the students in these studies also reported some close relationships with caring teachers (e.g., Cramond et al., 2007; Keighley & Kanevsky, 2003). Additionally, parental support for learning was evident across several studies in the form of high expectations (Renzulli & Park, 2000, 2002) and encouragement to remain in school (Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). However, some individuals did not perceive the support they desired (i.e., Peterson, 2001). Affective engagement appears to play some role for gifted dropouts and underachievers; however, this indicator may be less influential for gifted students than theory would dictate.

Finally, the literature indicates considerable cognitive disengagement among gifted students who underachieve and/or drop out of high school. Students repeatedly reported boredom in courses perceived to be irrelevant and frustration with meaningless busy work. Inappropriate course placement was evident, as many students slept through non-advanced coursework they considered to be unchallenging and intellectually insulting (Cramond et al., 2007; Hansen &

Toso, 2007; Hébert, 2001). Perhaps one reason that gifted underachievers and dropouts struggle to find relevance in their schoolwork is their uncertain career aspirations, another indicator of cognitive engagement (Cramond et al., 2007). Findings related to boredom and frustration with coursework were evident across a number of studies (Cramond et al., 2007; Hansen & Toso, 2007; Hébert, 2001; Kanevsky & Keighley, 2003; Seeley, 1988, as cited in Seeley, 2004). Notably, this particular indicator of cognitive engagement is not necessarily linked to improved achievement in the general population (Appleton et al., 2006; Spanjers, 2007). In contrast with affective engagement, cognitive engagement may be a more prominent variable in academic outcomes among gifted students than in the general population.

It is evident from this literature review that student engagement plays a role in the academic experiences of gifted dropouts and underachievers. The extent of this role is somewhat ambiguous, and empirical research exploring the predictive value of student engagement for this population will be necessary to further clarify the nature of the relationship. Nonetheless, student engagement is an important construct for identifying gift students at-risk for underachievement and premature discontinuation of education. As such, this review has implications for services for gifted students and prevention efforts.

Implications for Practice

Prevention. In order to prevent underachievement and dropout among gifted students, it is instructive to look to the dropout prevention literature for the general population. Reschly and Christenson (2006b) summarized effective prevention strategies, including supportive home and school environments, support for elementary to middle and middle to high school transitions, and regular monitoring of student engagement. The promotion of student engagement is inherent in each strategy and is vitally important in preventing high school dropout (Reschly & Christenson,

2006b). These strategies can be applicable to gifted populations as well. Most gifted students who dropped out reported losing interest in school late in elementary school or early in middle school (Cramond et al., 2007; Hansen & Toso, 2007), meaning that engagement has to be maintained for these students, rather than built from scratch. At the school level, Reschly and Christenson (2006b) lauded "providing opportunities for meaningful participation… and having high expectations for students" for promoting engagement and preventing dropout (p. 109). One means of providing these opportunities and expectations to gifted students is through appropriate instructional placement. Students in courses that provided instruction that did not match their academic abilities were bored, disinterested, and ultimately dropped out (e.g., Cramond et al., 2007; Hansen & Toso, 2007). Thus, gifted programming should be available to students at all grade levels. Middle and high school students should be encouraged to enroll in courses appropriate to their abilities (based on past performance), rather than taking less challenging courses to minimize work or protect their grade point average (c.f., Cramond et al., 2007).

The value of gifted service delivery is evident in research on students in enrichment programs. For example, in Matthews' (2006) study of gifted students who participated in a residential enrichment program, less than one percent of the students eventually dropped out of high school, which is considerably lower than the national dropout rate in the general population (e.g., Stillwell, 2010). Matthews (2006) suggested that high ability may have served as a protective factor, but it is also possible that exposure to stimulating, challenging, and appropriate curriculum promoted cognitive engagement among these students and subsequently led to continued high achievement. For example, in a study of gifted middle and high school students attending a summer enrichment program, Matthews and McBee (2007) found that students' previous underachievement in school had no bearing on their achievement-related behaviors

while attending the program. These results may be taken to indicate that when students were provided with appropriate and challenging enrichment experiences, they rose to the occasion.

As mentioned above, regular and consistent monitoring of student engagement also is recommended to prevent high school dropout in the general population (Reschly & Christenson, 2006b; Reschly & Lovelace, 2010). This recommendation allows schools to identify students at risk for poor outcomes early and provide intervention. Gifted students may present a unique early identification challenge, as they may continue to receive acceptable grades while engagement deteriorates. For example, one gifted underachiever reported sleeping through a course, but continuing to maintain a B average (Hébert, 2001). Thus, it is important that gifted students not be overlooked when engagement may be decreasing but achievement is still considered acceptable. Regular monitoring of engagement variables may help to identify underachieving gifted students at risk for dropping out.

A final preventative measure is encouraging students to become involved in extracurricular activities. Extracurricular involvement is one of the upper levels of school participation in Finn's (1989) engagement model, is recommended for encouraging student engagement (Christenson et al., 2008), and is linked to academic achievement and school completion in the general population (Dumais, 2006; Feldman & Matjasko, 2005). In the gifted literature, extracurricular involvement also appears influential. The majority of gifted individuals who underachieved during their K-12 schooling, but later achieved professional success had also been successful in extracurricular activities, including outside activities not affiliated with school (Peterson, 2001). Similarly, gifted adolescent underachievers who later demonstrated academic achievement identified extracurricular interests (e.g., dance, science, personal research) as a

contributing factor in their renewed academic interest (Emerick, 1992). Thus, extracurricular involvement is another important means of engaging students and preventing negative outcomes.

Intervention. As Reschly and Christenson (2006b) noted, dropout prevention and intervention methods may at times be one in the same. While attempting to intervene with a student at risk, one is simultaneously working to prevent dropout. Thus, provision of appropriate, challenging programs may be beneficial in remediating underachievement and the risk of dropping out among gifted students as well as preventing these risks. For example, Baum, Renzulli, and Hébert (1998) found that assigning gifted underachievers to self-selected and self-driven research projects resulted in improvements in achievement, effort in school, attitude to school, and behavior. Likewise, Emerick (1992) suggested allowing gifted underachievers opportunities to participate in gifted programming, including independent study projects. Allowing students some choice in their school projects allows them to find relevance in their work while simultaneously learning important academic skills related to the research process (Baum et al, 1998).

Self-selected projects allow students to focus on an area of interest (Baum et al, 1998). This narrowed focus closely mirrors a component included in some empirically supported dropout interventions with potentially positive effects (as rated by the U.S. Department of Education What Works Clearinghouse) for the general population: allowing students opportunities to gain knowledge and experience in work-related environments (e.g., Talent Development Program, Kemple, Herlihy, & Smith, 2005; Career Academies, Kemple & Snipes, 2000). Career-oriented educational opportunities would likely serve the same purpose of self-selected projects for gifted students by allowing them to engage in activities that are of interest to them, thus improving their cognitive engagement. Indeed, some participants in Cramond et al.'s

(2007) study expressed satisfaction with the work-study element of the alternative program they were attending.

Another component of empirically supported dropout interventions is that of a concerned adult providing guidance and assistance, or a mentor. This component is consistent in recommendations in the literature (Christenson & Thurlow, 2004; McPartland, 1993) as well as recommendations from students themselves as to what would assist them in remaining in school (Kortering & Braziel, 1999). Mentoring is a component of empirically supported interventions for the general population that have been rated as potentially positive by the What Works Clearinghouse (e.g., Twelve Together, Dynarski, Gleason, Rangerajan, & Wood, 1998; High School Redirection, Dynarski & Woods, 1997; Career Academies, Kemple & Snipes, 2000), including the Check & Connect program. Through Check & Connect, students and their families are paired with a mentor, who provides them with assistance in getting to and enrolling in school, procures rides to school when necessary, teaches them to use problem-solving to cope with and manage day-to-day problems, works with families to navigate the secondary school systems, and monitors their progress on various indicators of engagement, including attendance, suspensions, and credit hour accrual. (Sinclair et al., 1998; Sinclair et al., 2003; Sinclair et al., 2005). As previously mentioned, Check & Connect has documented efficacy for improving the engagement of students in special education (i.e., attendance, credit accrual, assignment completion; Sinclair et al., 1998), decreasing their odds for dropping out, and increasing the likelihood of graduating high school within five years (Sinclair et al., 2005).

The provision of mentoring is also a frequently suggested strategy for providing services for gifted students (Casey & Shore, 2000; Hébert & Neumeister, 2000) and for mitigating underachievement (Hébert & Olenchak, 2000; Shevitz, Weinfeld, Jeweler, & Barnes-Robinson,

2003). Students spend regular time with a mentor who provides guidance toward educational and career goals. Given the overall negative relationships with school personnel described by gifted dropouts and underachievers (Cramond et al., 2007; Hansen & Toso, 2007; Peterson, 2001; Renzulli & Park, 2000, 2002; Seeley, 1988), and the value some of these students placed on a close, caring relationship with teachers (Cramond et al., 2007; Kanevsky & Keighley, 2003), gifted students at risk for dropping out of high school would likely benefit from a relationship with a mentor to provide support and assistance in completing school.

In reporting the findings of what caused boredom for underachieving gifted high school students, Kanevsky and Keighley (2003) outlined five components of curriculum that the students in their study equated with meaningful learning, which they termed "the five C's" (p. 22). These components were having *control* over and *choice* in learning, *challenging* and *complex* (i.e., requiring learning beyond the surface-level) assignments, and *caring* teachers. These components, suggested by students, are imbedded in the approaches described above and indicate that students *want* to be engaged in school. Appropriate strategies can meet that need.

Future Directions

As mentioned above, the present literature review indicates a relationship between student engagement and underachievement and dropout among gifted students; however, the nature of a literature review does not allow for a full exploration of this relationship. First of all, only indirect support for student engagement could be inferred from the literature review, as variables such as credit hour accrual, extracurricular involvement, attendance, and so on, were not directly measured. Moreover, each of the studies reviewed incorporated different definitions of giftedness and underachievement, limiting the conclusions that can be drawn from the literature review. To this end, empirical research implementing a uniform definition of

giftedness, underachievement, and dropout and direct measurement of engagement variables would further elucidate the role engagement plays in gifted students' academic decisions. In particular, such research would also flesh out the differences in affective and cognitive engagement for gifted students and students in the general population implied by this review.

Another distinction between the various studies reviewed is methodological; as mentioned previously, the gifted dropout literature is characterized by large-scale quantitative studies aimed at describing the gifted dropout population, quantifying the number of gifted dropouts and the reasons students drop out, and identifying correlates of dropout (e.g., Bartnick & Parkay, 1991; Matthews, 2006; Renzulli & Park, 2000, 2002; Seeley, 1988 as cited in Seeley, 2004), as well as qualitative studies, aimed at providing a detailed analysis of the reasons that students dropout (e.g., Cramond et al., 2007; Hansen & Toso, 2007). Likewise, the gifted underachievement literature also is composed of quantitative studies with the purpose of understanding differences between gifted achievers and underachievers (e.g., Baker et al., 1998; Baslanti & McCoach, 2006; Colangelo et al., 1993; McCoach & Siegle, 2003) and qualitative studies, aimed at a more in-depth understanding of underachievement (e.g., Hébert, 2001; Peterson, 2001). Studying student engagement among gifted underachievers and dropouts bridges the gifted underachievement and dropout literature bases by examining a student-level factor that likely manifests in underachieving students and is linked to dropping out (Appleton et al., 2008; Archambault et al., 2009; Finn, 1989; Reschly & Christenson, 2006a).

Additionally, although this review focused primarily on engagement indicators, other themes are present in the literature regarding gifted dropout, including drug and alcohol use/abuse, learning disabilities, and family conflict **(**Cramond et al., 2007; Hansen & Toso, 2007; Renzulli & Park, 2000, 2002). These additional themes were not discussed in depth due to the

focus in this paper on student engagement; however, they are undoubtedly critical to intervention and are likely inextricable from student engagement. These factors should not be discounted in understanding, researching, and attempting to intervene with students at risk for dropping out of high school, gifted or not.

Conclusion

In summary, the gifted dropout is a frequently discussed, less frequently researched, and unexpected occurrence. The gifted student at risk for dropping out is all too easy to overlook. Early performance on measures of aptitude and achievement may blind educators to the possibility of failure for these students. Moreover, strong reasoning skills may allow these students to begin manifesting underachieving behaviors (i.e., failure to study) without immediate consequences to their grades (c.f., Balduf, 2009). As such, tracking engagement for these students may succeed as an indicator of potential risk for poor outcomes for gifted students where other indicators fail. Applying the construct of engagement to the phenomena of underachievement and gifted dropout is an important course for research.

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CHAPTER 3

STUDY 2:

STUDENT ENGAGEMENT AS A FACTOR UNDERLYING UNDERACHIEVEMENT AND DROPOUT AMONG GIFTED STUDENTS

Among the various barriers to gifted students' success delineated in the literature [e.g., perfectionism (Nugent, 2000), twice exceptionality (Seeley, 2004), social coping (Swiatek, 2002)], dropping out of high school is perhaps one of the most puzzling. Although it is understood that students who drop out do not necessarily do so because the work is too difficult (Reschly & Christenson, 2006b), it still comes as a great surprise to learn that students deemed highly capable of academic work may fail to complete high school, a basic level of education. Nonetheless, the phenomenon of gifted students dropping out is a reality, and an estimated 1 to 5% of gifted students leave high school prior to obtaining a diploma (Matthews, 2006; Renzulli & Park, 2000, 2002). High school dropout is a high-stakes issue, both for gifted students and the student population at large.

There can be no argument that high school dropout is an urgent issue at the forefront of educational interest. Of great concern is the magnitude of the issue, or the rate at which students drop out. The National Center for Education Statistics (NCES) provides various estimates of dropout rates, including the event rate (students leaving over the course of a year without graduating) and the status rate (students in an age group who are neither in school nor high school graduates), among others (Chapman, Laird, & KewalRamani, 2010). The event and status rates for the 2007-2008 academic year may not seem disturbing at first glance (3.5% and 8%,

respectively). Although it is certainly unfortunate when any student drops out of high school, these rates are not exceptionally high and have decreased to nearly half of what they were 30 years ago (Chapman et al., 2010). However, these rates may be artificially low given the fact that unless students officially notify schools of their decision to drop out, they may not be included in state calculations (Balfanz, Horning Fox, Bridgeland, & McNaught, 2009). Moreover, the average freshman graduation rate, or percentage of the ninth grade class graduating within four years for 2007-2008 was 74.9%, meaning that a quarter of students expected to graduate from high school did not (Chapman et al., 2010). This is an alarming number of students and highlights the severity of the high school dropout problem. Recent changes in legislation will require that all states provide a similar calculation, the cohort rate, each year, and will likely result in a decrease in reported graduation rates (Zubrzyki, 2012).

It has long been recognized that certain groups of students are disproportionately likely to drop out of high school. Although students of all races, financial circumstances, and ability levels are represented in the dropout population, students who are of minority backgrounds (particularly Hispanic or African American; Chapman et al., 2010), male, from low socioeconomic backgrounds (Rosenthal, 1998), and who have disabilities are more likely to drop out of high school (Aud et al., 2010; Rumberger, 1995) than their White, female, middle class, regular education peers. Some of these trends, specifically socioeconomic status and minority background, are also reflected in the gifted dropout population (Matthews, 2006; Renzulli & Park, 2000, 2002). These factors are student characteristics that are fixed and static; they cannot be changed through intervention and in some cases, should not. Researchers have distinguished these factors from variables that can be changed, or alterable variables (Finn, 1993; Reschly & Christenson, 2006b; Sinclair, Christenson, & Thurlow, 2005). For example, student engagement,

or a student's involvement, commitment, and general interest in school, is a variable that stakeholders have the capacity to change (Appleton, Christenson, & Furlong, 2008; Appleton, Christenson, Kim, & Reschly, 2006; Fredricks, Blumenfeld, & Paris, 2004). As such, variables like student engagement are more salient to the topic of dropout intervention (Christenson et al., 2008; Christenson & Thurlow, 2003), the ultimate goal of dropout research.

Beyond the fact that high rates of students dropping out indicate fundamental educational problems in need of resolution, the outcomes are quite dire. The economic and social consequences for the country, not to mention the personal costs to students themselves, are substantial (Bridgeland, DiIulio, & Morison, 2006). In general, individuals without a high school diploma are more likely to experience negative life outcomes, including poverty and incarceration (Bridgeland et al., 2006), and are increasingly less likely to have the skills and credentials required for gainful employment (Alliance for Education, 2008). High school dropouts are also more likely to require government assistance (Bridgeland et al., 2006). These outcomes are no less evident among gifted dropouts, with gifted students who drop out high school earning less than their graduating counterparts and requiring more financial assistance from the government (Shaw & Tallent-Runnels, 2007). Academic prowess cannot outweigh the harrowing effects that result from lacking a high school diploma (Shaw & Tallent-Runnels, 2007).

Given the unfavorable outcomes associated with dropping out and the seemingly paradoxical nature of gifted students dropping out, the subject of gifted dropout has received increased attention in the past decade, although interest spans back to at least the 1960s (i.e., French & Cardon, 1966). Studies have sought to describe the phenomenon, explore the reasons gifted students leave high school, and provide recommendations to prevent dropout from

occurring (e.g., Cramond, Kuss, & Nordin, 2007; Hansen & Toso, 2007; Matthews, 2006; Renzulli & Park, 2000, 2002). These studies provide stakeholders with a general understanding of some of the issues surrounding gifted dropout and open avenues for continued research. The present study links gifted dropout and the closely related issue of underachievement to a recent paradigm for understanding and mitigating dropout in the general population, namely, student engagement. First, the recent literature on gifted dropout and underachievement will be reviewed. Student engagement and its link to high school dropout will then be discussed. Finally, the present study and its rationale will be presented.

Gifted Students Dropping Out

The recent research literature on gifted dropout can be primarily be broken into two categories: a) large-scale studies which broadly describe the demographics of the population, survey response reasons for leaving, and identify correlates, and b) qualitative studies that explore gifted students' reasons for dropping out. The former category provides an understanding of characteristics of gifted students most at risk for dropping out. The latter provides an in-depth analysis of gifted students' personal perceptions of their school experiences and ultimate decisions to drop out.

In one of the most commonly referenced studies of gifted dropouts, Renzulli and Park (2000) used data from the National Center for Education Statistics' (NCES) National Education Longitudinal Study of 1988 (NELS:88) and follow-up studies to ascertain information about demographics of the gifted dropout population, the reasons behind dropout, parent perceptions, and predictors of dropout. A second report (Renzulli & Park, 2002), submitted for the National Research Center on the Gifted and Talented, reported on the above factors as well as drug use, parental expectations, and future aspirations, self-concept, and locus of control. Renzulli and

Park (2000, 2002) created a gifted variable from the information provided in the NELS:88 survey, and students were classified as gifted if they had taken three or more advanced courses by eighth grade and/or had at some point been identified as gifted. Dropouts were those "students who were not in an academic program leading to a high school diploma, had not received a GED by the spring of [their graduating year], and who completed the dropout questionnaire in the second follow-up [conducted by NCES]" (Renzulli & Park, 2000, p. 264).

Findings from the study revealed that approximately a quarter of the students who dropped out could be identified as gifted under Renzulli and Park's (2000, 2002) definition, and of the students identified as gifted, approximately 5% dropped out. Minority students and students from low socioeconomic backgrounds were disproportionately represented in the sample of gifted dropouts (Renzulli & Park, 2000, 2002). Gifted students dropped out for a number of reasons, which differed in prominence between males and females. Among the top-rated reasons for leaving school among both male and female dropouts were a dislike of school, failing, and difficulty keeping up with schoolwork. Moreover, about a fifth of both males and females reported a sense of not belonging at school (Renzulli & Park, 2000, 2002). In terms of parental perceptions, most of the students reported that their parents were unhappy with their decision to drop out and attempted to persuade them to remain in school; however, most parents ultimately left the decision to the student. Parents held high expectations for their children, and most of the students had future employment aspirations (Renzulli & Park, 2000, 2002). Despite many students feeling that they did not belong at school, general self-concept was higher among gifted dropouts than non-gifted dropouts (Renzulli & Park, 2002). Finally, significant predictors of dropout among gifted students included having a child, not having plans for college, being male and non-White, and having a parent who had dropped out of high school (Renzulli & Park,

2000, 2002). Overall, the results provide extensive information about which gifted students drop out and why.

Renzulli and Park (2000, 2002) sought to identify gifted dropouts based on identification trends in the field of gifted education; as such, their definition of gifted was purposely broad. In a separate study, Matthews (2006) adopted a more conservative definition, surveying students participating in a summer enrichment program. All students had measured achievement or cognitive ability scores at or above the 95th percentile. Matthew's (2006) purpose of applying the more conservative definition was to determine if patterns and reasons for gifted students dropping out were different for students of varying ability levels within the gifted population.

One hypothesized difference between highly gifted students and gifted students at lower ability levels (i.e., below the 95th percentile) was that the dropout rate would be lower among highly gifted students (Matthews, 2006). Indeed, in close to 8,000 highly gifted students who were participants in the study, 0.43% dropped out. Approximately a quarter of these students left school to pursue an alternative educational option, including attending college and attending a GED program. Without these students included, the dropout rate was .37%. These percentages are considerably lower than Renzulli and Park's (2000, 2002) estimate, as well as the national dropout rate in the general population (Chapman et al., 2010), regardless of the calculation method (see above). Among these students, African American students were over-represented in the gifted dropout population (Matthews, 2006).

Another hypothesis Matthews (2006) proposed about dropout among students in a highly gifted population was that "reasons for dropping out might…differ in relative importance, although not necessarily in kind" (p. 218). This expectation was partially borne out. As mentioned, about a quarter of highly gifted dropouts left school in order to pursue other

educational options, including college. Based on data from the North Carolina Education Research Data Center, the state in which the study was conducted, highly gifted students dropped out for this reason more often than their regular education counterparts (Matthews, 2006). However, the most commonly rated reason for highly gifted students dropping out, attendance, was also the most prominent reason for other dropouts in North Carolina (Matthews, 2006); in addition, it is a powerful predictor of dropout in other students (Ou & Reynolds, 2008; Reschly & Christenson, 2006a). Other reasons highly gifted students gave for dropping out included academic and discipline problems and entering the workforce (Matthews, 2006).

Finally, Seeley (1988, as cited in Seeley, 2004) interviewed 128 gifted students who had dropped out of high school about why they left. A number of reasons emerged from the students' reports, including reasons concerning school structure, such as discomfort with school rules, policies (e.g., attendance, start time) and school size, and those personal to the student, such as boredom with schoolwork, underachievement, student mobility, and poor relationships with teachers and other school personnel (Seeley, 1988, as cited in Seeley, 2004). Unfortunately, the original article was not available, thus the manner in which giftedness was defined and more specific details about how students were interviewed and the primary reasons for leaving are unknown.

Collectively, Renzulli and Park (2000, 2002) and Matthews' (2006) studies indicate that rates of dropping out of high school among the gifted population range from less than 1% to 5%, depending on how giftedness is defined. It appears that gifted students who score among the top 5% of their peers on measures of cognitive abilities and achievement (i.e., the highly gifted) are less likely to drop out of high school; however, this conclusion should be considered with caution. The students in Matthews' (2006) study chose to participate in a selective academic

enrichment program during the summer, indicating high academic interest and motivation, factors which were likely influential in the lower dropout rate (Matthews, 2006). Minority students, particularly African American students, are over-represented among gifted dropouts, and reasons for dropping out are many and varied. Attendance problems, the decision to work, academic difficulties, and a general dislike of school were some of the primary reasons characterizing gifted students' reasons for dropping out of high school (Matthews, 2006; Renzulli & Park, 2000, 2002; Seeley, 1988, as cited in Seeley, 2004).

Interviewing Gifted Dropouts

As mentioned above, gifted dropouts endorsed a number of reasons for their decision to leave school. Both Matthews (2006) and Renzulli & Park's (2000, 2002) studies used an approach that allowed students to simply select reasons from a list provided to them. Qualitative studies of gifted dropouts have taken a different approach. A small number of students are asked open-ended questions about their decision to drop out, allowing them to provide personal and elaborate responses. As such, these studies provide an in-depth and perhaps more nuanced understanding of why some gifted students drop out.

At least two recent studies have been qualitative in nature. In both studies, gifted students who had dropped out of high school were recruited and provided opportunities to elaborate on their school experiences. Their responses were then analyzed and summarized into themes (Cramond et al., 2007; Hansen & Toso, 2007). In one study, Cramond et al. (2007) interviewed 13 young adults, ranging in age from 17 to 21, who had either been previously identified as gifted or nominated by school personnel, and had dropped out of high school. The majority of these students were enrolled in an alternative school specifically designed to allow students to complete a high school education after dropping out of high school (Cramond et al., 2007).

Students were interviewed in a semi-structured format and asked questions regarding their past and current school experiences, starting with elementary school, and their reasons for leaving school (Cramond et al., 2007).

Cramond et al. (2007) identified a number of themes from their interviews, summarized below. These themes included emotional asynchrony (i.e., feeling as though one is "out of sync with" or on a different level from same-age peers; Silverman, 1993), dissatisfaction with school, disengagement, lack of support from school personnel, and underachievement (Cramond et al., 2007). Students felt that their concerns were discordant with those of their peers; they characterized their peers' concerns (e.g., gossip, fashion) as trivial compared to their own concerns about poverty, community needs, and so forth. Additionally, they described their school experiences as irrelevant, boring, slow-paced, and insufficiently intellectually challenging. When asked when they lost interest in school, many of the students described early academic success, followed by disengagement in late elementary/ early middle school. In terms of support from teachers and personnel, students perceived that they were considered unimportant, although several also described close and influential relationships with a respected teacher. Finally, underachievement was a theme evident for many of the students. They admitted to putting in minimal effort and sleeping through classes; many said they simply were not motivated by school. In addition, many self-selected into regular education courses, despite the availability of advanced placement and honors level courses. These courses appeared to further exacerbate their disengagement, as unchallenging work fueled their frustration with school (Cramond at al., 2007).

Many of the themes found in Cramond et al.'s (2007) research were echoed in Hansen and Toso's (2007) study. These authors collected information from 14 participants who had

dropped out of high school. All had been identified as gifted or were nominated as gifted by a "sponsor" (Hansen & Toso, 2007 p. 33). Hansen and Toso (2007) collected information on these individual's reasons for dropping out through open-ended questions on a survey, followed by individual interviews. Similar to Cramond et al. (2007), themes from this study included early disengagement, poor relationships with peers and school staff, and dissatisfaction with coursework (Hansen & Toso, 2007). Personal problems, family conflict, and drug and alcohol use also were themes in this study (Hansen & Toso, 2007); similarly, these issues were mentioned by some participants in Cramond et al.'s (2007) study as well.

The findings from these two qualitative studies provide further illumination into the reasons that gifted students drop out of high school. Although the nature of qualitative research tends to require small sample sizes, prohibiting generalization, it is quite telling that similar results were obtained across the two studies. Further, Renzulli and Park's (2000, 2002) findings also revealed a general dislike of school and feelings of not belonging. It is clear that although gifted students drop out of high school for a number of unique and personal reasons, certain common reasons may factor into gifted dropouts' decision to leave school.

Underachievement

One pronounced theme from Cramond et al.'s (2007) study, underachievement, merits further discussion. Underachievement, or achieving below one's measured potential (Reis & McCoach, 2000), is a prominent topic in gifted education literature as well as a theme in dropout literature in the general population (e.g., Bridgeland et al., 2006). As Matthews (2006) pointed out, dropout can be considered "an extreme manifestation of academic underachievement" (p. 217); Matthews (2006) also noted that the small gifted dropout literature base can be expanded with the discussion of underachievement. This approach is also used here.

As mentioned above, underachievement in the gifted literature is defined as "exhibit[ing] a severe discrepancy between expected achievement (as measured by standardized achievement test scores or cognitive or intellectual ability assessments) and actual achievement (as measured by class grades and teacher evaluations)" (Reis & McCoach, 2000, p. 157). According to Kerr (1991), this severe discrepancy may be a function of measurement error, students learning without demonstrating their knowledge in class, or students only choosing to put forth effort for important occasions, such as achievement tests. Regarding Kerr's (1991) first explanation, a certain degree of discrepancy is expected due to the inherent error in all testing instruments and regression to the mean; thus, it is not necessarily cause for concern. However, most would agree that when students exhibiting extremely high ability also exhibit classroom failure, explanations beyond an inability to comprehend or measurement error must be considered. At some mid-point between these two extremes, students are achieving below their capacity at a level worthy of concern. Finding this middle ground is source of disagreement among scholars, and at the heart of the underachievement definition (Matthews & McBee, 2007). In practice, underachievement among gifted students is often defined by an exceptionally high score (90^{th} or 95^{th} percentile) on a standardized measure of cognitive ability or academic achievement and a lower than expected classroom performance, often operationalized as grade point average (GPA). The GPA component of the definition varies across studies, but is typically below a B-average or 3.0 (e.g., Colangelo, Kerr, Christensen, & Maxey, 1993; Hébert, 2001; McCoach & Siegle, 2003; Peterson, 2000). Other methods for defining poor classroom performance have included removal or risk of removal from gifted programs (e.g., Baker, Bridger, & Evans, 1998; Hébert, 2001), falling in the bottom half of one's class (McCoach & Siegle, 2003), and falling one standard deviation below the mean GPA of a group (Matthews & McBee, 2007).

A number of factors have been implicated in the underachievement of gifted students. Baker et al. (1995) organized these factors into three categories: personal attributes, family, and school. Individual factors such as poor study and organizational skills (Baker et al., 1998; Colangelo et al., 1993; Hébert, 2001), ambivalent attitudes toward teachers and school, behavior problems (Hébert, 2001), lower motivation and self-regulation than achieving gifted counterparts (Baslanti & McCoach, 2006; McCoach & Siegle, 2003), and poor time management (Hébert, 2001) have been implicated in gifted students' underachievement. Factors related to students' families, including poor parental modeling of achievement-related behaviors (Hébert, 2001; Peterson, 2001), inadequate support for academic achievement from parents, family conflict (Hébert, 1998, 2001; Peterson, 2001), difficult sibling relationships (Hébert, 2001), inadequate parenting skills (Baker et al., 1998) have also been linked to underachievement. Finally, some research points to the influence of the school environment on gifted students' underachievement. Specifically, students' perceptions that curriculum was boring and unchallenging (Hébert, 2001; Kanevsky & Keighley, 2003) and that teachers were disinterested in them (Peterson, 2001) have been identified in the school experiences of underachieving gifted students. Not surprisingly, the best framework for understanding underachievement is one that incorporates multiple pathways, including personal, family, and school factors (Baker et al., 1998).

Student Engagement

Perceived irrelevance of school and coursework, a sense of not belonging, poor attendance, a perceived lack of support from school staff, poorly defined or absent goals; these are all factors prominent in the literature on gifted underachievement and dropout (Cramond et al., 2007; Hansen & Toso, 2007; Hébert, 2001; Kanevsky & Keighley, 2003; Matthews, 2006; McCoach & Siegle, 2003; Peterson, 2001; Renzulli & Park, 2000, 2002). They also are

indicators of student engagement, a construct that is considered essential in predicting, preventing, and understanding high school dropout (Appleton et al., 2008; Reschly & Christenson, 2006a; Sinclair, Christenson, Lehr, & Anderson, 2003). Student engagement has been described as a meta-construct (Fredricks, Blumenthal, & Paris, 2004), incorporating students' behaviors, perceptions, and beliefs related to school, school's relevance, and their support systems. Current conceptualizations of engagement stem from Finn's (1989) participation-identification (PI) model (Reschly & Christenson, 2006a), in which he proposed a cyclical pattern of participation and identification. Students who actively participate and engage in school-related activities are likely to experience academic success. This success allows them to feel a sense of belonging and identification with school, which induces further participation (Finn, 1989). Although other factors are included in the model, the two primary concepts, participation and identification, continue to form the basis of engagement theory (e.g., Christenson et al., 2008; Reschly & Christenson, 2006a).

Most current models of engagement include at least three forms: affective, cognitive, and behavioral engagement (Appleton et al., 2008; Fredricks et al., 2004). Affective engagement encompasses a sense of belonging at school and perceived support from parents, teachers, and peers. Cognitive engagement refers to students' valuation of school, or their perception that school has worth and meaning, as well as their school-related self-regulatory behaviors. Finally, behavioral engagement is overt, participatory behavior, including attending school, participating in extracurricular activities and class, and demonstrating appropriate behavior (Appleton Christenson, Kim, & Reschly, 2006; Christenson & Anderson, 2002; Fredricks, et al., 2004; Reschly & Christenson, 2006a). Christenson and Anderson (2002) proposed a model including a fourth form of engagement, academic engagement, and this model was expanded on by Reschly

and Christenson (2006a) and Appleton et al. (2006). Academic engagement includes time spent on task, completion of homework, and earning credit hours (Appleton et al., 2006; Reschly & Christenson, 2006a).

When these forms of engagement are considered separately, research supports a link between each one and school-related outcomes. Indicators of academic engagement are related to academic achievement (DiPerna, Volpe, & Elliott, 2002, 2005; Finn, 1993; Finn & Cox, 1992; Hughes, Luo, Kwok, & Lloyd, 2008; Singh, Granville, & Dika, 2002), which in turn relates to dropping out (Hess, Lyons, Corsino, & Wells, 1989; Hickman, Bartholomew, Mathwig, & Heinrich, 2008). The relationship between behavioral engagement and student outcomes is similarly robust; increased behavioral engagement is related to academic achievement in the short- (Dumais, 2006; Finn & Cox, 1992) and long-term (Finn, 2006), whereas a lack of behavioral engagement, particularly school attendance, is predictive of dropping out (Alexander, Entwisle, & Horsey, 1997; Ou & Reynolds, 2008; Reschly & Christenson, 2006a). In terms of affective engagement, various indicators of this construct are related to academic achievement and effort (Finn, 1993; Wentzel, 1997), mental and physical health behaviors (e.g., suicide, drug use, etc., Resnick et al., 1997), and general well-being (You et al., 2008). Finally, valuing learning (Finn, 1993) and having goals and aspirations for the future (Spanjers, 2007), indicators of cognitive engagement, are positively related to academic achievement.

Student engagement also has been examined as a unified construct for predicting high school dropout. Reschly and Christenson (2006a) used the NELS:88 database to examine the relationship between student engagement (behavioral, cognitive, and affective forms) and high school dropout among students with and without disabilities. Using student engagement and dropout-related covariates (i.e., grade retention, achievement, and socioeconomic status),

Reschly and Christenson (2006a) examined how well each variable differentiated students who did and did not drop out. They found that the covariates alone provided a high percentage of correct classification for all students, and that behavioral engagement improved the prediction of dropout for students with disabilities. Cognitive and affective engagement, however, added minimal improvement to group prediction (Reschly & Christenson, 2006a).

Archambault, Janozs, Fallu, and Pagani (2009) also examined the relationship between cognitive, affective, and behavioral forms of engagement high school dropout in Canadian adolescents. Their results were very similar to those of Reschly and Christenson (2006a). With dropout-related covariates taken into account, only behavioral engagement was a significant predictor of dropout. However, although none of the engagement components were meaningful predictors of dropout among students without disabilities in Reschly and Christenson's (2006a) study, Archambault et al.'s (2009) did not distinguish between students with and without disabilities. Thus, it may be behavioral engagement is a useful predictor of dropout for students with and without disabilities.

Both Archambault et al. (2009) and Reschly and Christenson (2006a) found that cognitive and affective forms of engagement were not significant in predicting who would drop out of high school. Part of this finding may lie in the fact that students engaging in some forms of behavioral disengagement, such as failing to attend school and misbehaving, may ultimately be pushed out, as behavior problems can lead to suspension and expulsion and lack of attendance can lead to grade retention and even legal action. Students must attend school in order to graduate, but they need not value or feel attached to school to graduate. Nonetheless, these findings should not be taken to indicate that cognitive and affective engagement are unimportant components of an engagement model. Reschly and Christenson (2006a) and Archambault et al.

(2009) both suggested that affective and cognitive engagement precede behavioral engagement, which is then related to dropping out. Furrer and Skinner's (2003) study supports this hypothesis; the degree to which students felt valued by their parents, teachers, and peers (an indicator of affective engagement) was related to behavioral engagement. Moreover, Wentzel's (1997) study revealed a significant relationship between students' perceptions of teachers caring about them and the academic effort they expended. Finally, Lovelace, Reschly, Appleton, and Lutz (2012) found that students with low (i.e., 5th percentile and below) cognitive and affective engagement were at greater risk for dropping out than their engaged counterparts. Although the relationship between dropping out and cognitive and affective engagement may not be direct, these forms of student engagement are still considered critical to a comprehensive student engagement model (Appleton et al., 2006).

In addition to providing a framework for predicting and conceptualizing student outcomes, student engagement is useful in prevention and intervention efforts (Reschly & Christenson, 2006a). Indeed, the promotion of student engagement is inherent in empirically supported dropout intervention programs through personalizing school, "connecting students to an attainable future" (Fashola & Slavins, 1998, p. 179) and monitoring variables such as attendance and school progress (Sinclair, Christenson, Evelo, & Hurley, 1998; Sinclair et al., 2003; Sinclair, Christenson, & Thurlow, 2005). Schools can also be personalized through mentorships (e.g., Dynarski, Gleason, Rangerajan, & Wood, 1998; Dynarski & Woods, 1997; Kemple & Snipes, 2000; Sinclair, Christenson, Elevo, & Hurley, 1998, Sinclair, Christenson, & Thurlow, 2005), counseling, tutoring (Christenson & Thurlow, 2004), and smaller class sizes (Dynarski & Gleason, 2002). Connections are made to students' futures through work-study type programs that allow students to gain experience in real work environments (e.g., Kemple,

Herlihy, & Smith, 2005; Kemple & Snipes, 2000). Through all of these intervention components, student engagement is fostered by increasing students' personal connection with school and the relevance school holds for them, and intervening when observable indicators, such as attendance, indicate a risk for poor outcomes.

The Present Study

Despite the fact that student engagement variables are inherent in the literature on gifted dropout and underachievement, no known study has applied the construct of student engagement to gifted students. This construct has utility in predicting and preventing dropout in the general population (Anderson, Christenson, Sinclair, & Lehr, 2004; Archambault et al., 2009; Reschly & Christenson, 2006a; Sinclair, Christenson, Evelo, & Hurley, 1998; Sinclair, Christenson, & Thurlow, 2005), and could prove useful in serving these purposes for gifted students as well. As gifted students are unlikely to display some of the early risk factors for dropout, such as early school failure, student engagement may be one of the few indicators that can identify gifted students at risk for dropping out early in their academic careers. Additionally, examining student engagement among gifted students represents a new approach in the literature on gifted dropout (Landis & Reschly, 2012). Large-scale quantitative studies allow for the description of the population and surface understanding of why students dropout. Qualitative studies then allow for in-depth analysis of students' reasons for dropping out. Student engagement provides a logical next step by investigating an underlying, measurable, and alterable variable that is influential in student outcomes. Thus far, literature on gifted dropout has provided information regarding which gifted students drop out and why; student engagement provides early prediction and specific targets for intervention that *can be changed*.

The purpose of the present study is to investigate the associations between student engagement, underachievement, and dropout among gifted students. First of all, given the utility of student engagement in predicting dropout among students with and without disabilities (Archambault et al., 2009; Reschly & Christenson, 2006a), this construct also may be useful in predicting dropout among gifted students. Moreover, as dropout may be considered a form of underachievement among gifted students (Matthews, 2006), but not all gifted underachievers drop out (Peterson, 2001) gifted students who are underachieving may differ in their engagement patterns from gifted students who drop out. Specifically, gifted students who drop out may demonstrate less favorable behavioral engagement than their underachieving peers, as behavioral engagement is the best predictor of dropout of the engagement variables (Archambault et al., 2009; Reschly & Christenson, 2006a). Likewise, gifted underachievers likely manifest less favorable engagement than their achieving counterparts. Thus, the following research questions are proposed:

1. What are the demographic characteristics of gifted underachievers? Of gifted students who fail to graduate?
2. To what extent does student engagement (affective, behavioral, cognitive) differ between underachieving gifted students and gifted students who leave their regular school without graduating?
3. Do underachieving gifted students manifest less favorable affective, behavioral and cognitive engagement than their gifted high achieving peers?
4. Does student engagement (affective, behavioral, cognitive) predict which ninth grade gifted students will not complete high school in the regular setting three years later?

Regarding the first research question, Colangelo et al. (1993) characterized the gifted underachieving population as composed primarily of “white, middle-class males” (p. 160). However, the underrepresentation of minority students in gifted programs (Ford & Grantham, 2003) may undercut the identification of underachieving gifted students of minority background. This study will use a broader definition of giftedness than Colangelo et al. (1993) used, meaning a larger group of students will be identified as gifted. As such, the demographic characteristics of this population should be defined. Concerning gifted students who do not graduate, this study will use a definition of gifted based on Renzulli and Reis’ (1997) talent pool identification scheme, in which the top 15 to 20 percent of students are identified as gifted. Thus, it is expected that results will be similar to those of Renzulli and Park (2000, 2002), as both this study and the aforementioned study extend giftedness to a broader than usual range of students.

In terms of the second and third research questions, dropout is thought to be a long-term process characterized by increasing disengagement (Finn, 1989). Moreover, more latent forms of disengagement (i.e., affective and cognitive) may precede behavioral disengagement (Archambault et al., 2009; Reschly & Christenson, 2006a). As such, it is expected that underachieving gifted students may manifest the more subtle forms of disengagement (affective and cognitive) at similar levels to gifted students who leave high school; however, gifted non-graduates are expected to demonstrate lower rates of behavioral engagement. For both gifted non-graduates and underachievers, affective, behavioral, and cognitive forms of engagement are expected to be lower than that of high achieving gifted peers. If borne out, these hypotheses will not only illuminate the process of disengagement among gifted students, but also provide partial support for the contention that behavioral engagement mediates the relationship between affective and cognitive forms of student engagement and high school dropout (i.e., Archambault

et al., 2009; Reschly & Christenson, 2006a). With regard to the fourth research question, it is expected that all forms of student engagement will predict which gifted students will not graduate from high school, and that the cognitive form of engagement will play a more prominent role in this prediction than it has in prior research (i.e., Archambault et al., 2009; Reschly & Christenson, 2006b). This prediction is based on Landis and Reschly's (2012) finding that cognitive engagement appeared to be a consistent and strong theme in the gifted dropout and underachievement literature.

Methods

Participants

Two groups of participants were included in this study. The first group of participants included all sixth through twelfth grade gifted students in a large Southeastern school district who completed the Student Engagement Instrument (SEI), described below, during the Fall administration in the 2010-2011 academic years. All students in the district are administered the SEI twice during each academic year; in the Fall and Spring. Based on criteria described below, 33,158 students were identified as gifted in the first sample. The second group of participants included all gifted students who were in the ninth grade in 2007-2008 (3,941). The district is currently comprised of 158,433 students, and based on Lovelace et al.'s (2012) study, approximately 60,000 of these students are in the sixth through twelfth grades. For the first sample, approximately half of the students were male (51.5%) and half were female. The majority (approximately 75%) spoke English as their primary language. The ethnicities of the students in the sample were as follows: approximately 50% (16,751) of the students were White, approximately 17% (5,714) were African American, approximately 15% (4,901) were Asian/Pacific Islander, approximately 13% (4,268) were Hispanic, approximately 4% (1,392)

were multiracial, and less than 1% (132) were Native American/Alaskan Native. Approximately 30% (9,806) of students qualified for free or reduced price lunch. Demographic characteristics of the second sample were similar; approximately half were male (2,003) and 18.3% (721) qualified for free or reduced price lunch. The ethnicities of the students in the second sample were as follows: approximately 56% (2,217) of the students were White, approximately 14% (547) were African American, approximately 15% (574) were Asian/Pacific Islander, approximately 10% (411) were Hispanic, 4.5% (176) were multiracial, and less than 1% (16) were Native American/Alaskan Native. Compared to the district at large, this sample includes more White and Asian students and fewer African American and Hispanic students, as well as fewer students who are eligible for free or reduced price lunch. After data were screened for missing values, and cases with excessive missing values were removed (c.f., Lovelace et al., 2012), the first sample contained 24,523 students and the second sample contained 2,664 students. Data screening procedures are described below. Students who completed less than 75% (25 items) of the SEI were excluded from analyses (c.f., Lovelace et al., 2012).

The full sample (33,158 students) was used to answer research question one. The sample for the second research question consisted of all gifted underachievers and non-graduates (2,958) for whom engagement data from 2010-2011 were available, and the sample for the third research question consisted of all gifted underachievers and high achievers for whom engagement data from 2010-2011 were available (9,015). The sample for the fourth research question was comprised of all gifted students who were in the ninth grade in 2007-2008 and for whom engagement data from 2007-2008 and recent achievement testing (as of the Fall of the 2007-2008 academic year) were available (2,664).

For the purposes of this study, students were categorized as gifted if they had been identified as gifted by the school district and/or their third, fifth, or eighth grade Reading, Math, or Total composite scores on the Iowa Tests of Basic Skills (ITBS), a norm-referenced, standardized achievement test, fell at or above the 80th percentile. As mentioned above, this definition is based on Renzulli and Reis' (1997) talent pool identification scheme, including the top 15 to 20 percent of students as gifted. The rationale for adopting this broad definition is to include students who might not meet the more stringent requirements typically adopted by state departments of education (i.e., 95th or 97th percentile; McClain & Pfeiffer, 2012), but still demonstrate achievement that is substantially above average. With regard to high school dropout, students performing at the 80th percentile are considered no less capable of completing high school than those at the 95th percentile.

Underachievement/Achievement. Underachievement and high achievement were operationalized in this study using students' a "pseudo" GPA. The pseudo GPA was calculated by "weighting grade points by credits earned and then dividing by credits attempted" (J. Appleton, personal communication, February 3, 2012). This procedure yielded GPA scores between 0 and 100, with 90 and above falling in the A range, 80 to 89 falling in the B range, 74 to 79 falling in the C range, 70 to 73 falling in the D range, and scores below 70 falling in the U range. These ranges are based on the district's standards [Gwinnett County Public Schools (GCPS), 2012b]. A pseudo GPA had to be available in order for students to be included in the sample. Students also initially were classified as underachieving based on their relative ranking in their grade level, specifically; falling in the bottom half of all students in their grade level (McCoach & Siegle, 2003). This method was selected based on prior literature (i.e., Colangelo et al., 1993; Hébert, 2001, McCoach & Siegle, 2003); however, a number of students who were

relatively high achieving (i.e., B averages) were identified in this way. Thus, only students with GPAs of 79 and below (approximately a C average) were classified as underachievers (c.f., Hébert, 2001). It is likely that this discrepancy is large enough to rule out measurement error and capture students who are in fact achieving below their potential. Students with a GPA of 90 and above (an A average) were classified as high-achieving (c.f., Colangelo et al., 1993; McCoach & Siegle, 2003). Using these criteria, 4,270 gifted students were classified as underachieving (approximately 13%). Of these students, 78 students were also classified as non-graduates (see explanation below); the final sample size of underachieving gifted students was 4,192. Using the criteria for high achievement, 11,817 students were classified as high-achieving (36%). Nine of these students were also classified as non-graduates; the final sample size for high achieving gifted students was 11,808. Demographic data for students classified as underachievers and high achievers can be found in Table 1.

Table 1

Demographic Characteristics of Gifted High Achievers and Underachievers

Variable		Number of Participants		Percentage	
		High Achievers (HA)	Underachievers (UA)	HA	UA
Gender	Male	5,016	2,857	42.5	68.2
	Female	6,792	1,335	57.5	31.8
Race	White	6,067	1,882	51.4	44.9
	African American	1,478	938	12.5	22.4
	Asian/Pacific Islander	2,685	289	22.7	6.9
	Hispanic	1,110	839	9.4	20.0
	Multiracial	424	224	3.6	5.3
	Native American/ Alaskan Native	44	20	.4	.5
Free/Reduced Lunch	Eligible	2,607	1,860	22.1	44.4
	Ineligible	9,201	2,332	77.9	55.6

Non-graduates. Students were classified as non-graduates based on criteria established by Lovelace et al. (2012). For the first, second and third research question (Sample 1), non-graduates were those students who left their regular school without graduating during the 2010-2011 academic year and twelfth grade students who did not graduate during the 2010-2011 academic year. Students who did not graduate, but transferred to a school outside of the district were not included as non-graduates, as they potentially graduated after transferring. Using these criteria, 108 students were classified as non-graduates for research questions one, two, and three. For the fourth research question, students who were in the ninth grade in 2007-2008 (Sample 2) were tracked through the 2010-2011 academic year. If they left their regular school without graduating in 2007-2008, 2008-2009, 2009-2010, or 2010-2011, without returning to school prior to 2010-2011, or were in the twelfth grade and did not graduate in 2010-2011, they were classified as non-graduates. Students who transferred out of the district, left to attend homeschool, or graduated prior to 2011 were not classified as non-graduates. Ninety-one students in Sample 2 were classified as non-graduates (approximately 2%). Reasons for leaving were obtained from district archival data, and included compulsory removal due to non-attendance, court ordered removal, incarceration, transfer to Department of Juvenile Justice, enrolling in adult education, low grades or failure, and unknown. Demographic data for students classified as non-graduates can be found in Table 2. Reasons for leaving the regular high school setting are summarized in Table 3 (c.f., Lovelace et al., 2012).

Table 2

Demographic Characteristics of Gifted Non-Graduates

Variable		Number of Participants		Percentage	
		Sample 1	Sample 2	Sample 1	Sample 2
Gender	Male	75	59	69.4	64.8
	Female	33	32	30.6	35.2
Race	White	56	57	51.9	62.6
	African American	18	6	16.7	6.6
	Asian/Pacific Islander	7	6	6.5	6.6
	Hispanic	20	17	18.5	18.7
	Multiracial	5	4	4.6	4.4
	Native American/Alaskan Native	2	1	1.9	1.1
Free/Reduced Lunch	Eligible	41	28	38.0	30.8
	Ineligible	67	63	62.0	69.2

Table 3

Reasons for Leaving Prior to Graduation

Reason for Leaving	Sample 1		Sample 2	
	Number of Students	Percentage	Number of Students	Percentage
Adult Education/Post-Secondary Education	22	20.4	28	30.8
Court Order or Legally Requirement	15	13.9	0	0
Incarcerated	1	0.9	1	1.1
Low Grades/Failure	1	0.9	0	0
Removed for Non-Attendance	16	14.8	18	19.8
Transfer to Department of Juvenile Justice	1	0.9	0	0
None (Twelfth Graders who did not Graduate)	39	36.1	36	39.6
Withdrawn Pending Alternative School Transfer	0	0	6	6.6
Unknown	13	12.0	2	2.2

Measures

Student engagement was quantified using several different measures. As affective and cognitive forms of engagement are composed of student perceptions and attitudes, these components were measured through student self-report on the Student Engagement Instrument (discussed below). Behavioral engagement consists of observable student behaviors and was measured through information obtained from district archival records.

Student Engagement Instrument. The Student Engagement Instrument (SEI) was used to measure affective and cognitive engagement. This instrument is administered to all sixth through twelfth-grade students in the district two times each academic year. The SEI can be administered as a 33 or 35-item scale. The 35-item scale includes an additional scale, Extrinsic Motivation (Appleton et al, 2006). The SEI is a self-report instrument using a 5-point Likert-scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree). Prior to the 2008-2009 academic year, the SEI used a 4-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree, J. Appleton, personal communication, March 15, 2012). It was developed to measure affective and cognitive engagement (Appleton et al., 2006; Betts, Appleton, Reschly, Christenson, & Huebner, 2010). Literature review and exploratory followed by confirmatory factor analyses revealed six subscales, three comprising affective engagement [Teacher-Student Relationships (TSR), Peer Support for Learning (PSL), and Family Support for Learning (FSL)] and three comprising cognitive engagement [Control and Relevance of School Work (CRSW), Future Aspirations and Goals (FG), and Extrinsic Motivation; Appleton et al., 2006]. The final version of the SEI included all of the above subscales; however, the Extrinsic Motivation subscale is not always

used in research studies (e.g., Betts et al., 2010; Lovelace et al., 2012). For the purposes of this study, the 33-item, five-factor model was used. The Extrinsic Motivation subscale was not used.

Reliability of the SEI has been supported through internal consistency values obtained with participants of varying ethnic and economic backgrounds (Appleton et al., 2006) and participants in general and special education (Lovelace et al., 2012). Coefficient alpha values ranges for each of the subscales are as follows: .86-.88 for TSR, .80-.81 for CRSW, .78-.82 for PSL, .78-.83 for FG, and .75-.78 for FSL (Appleton et al., 2006; Lovelace et al., 2012). Lovelace et al. (2012) also found internal consistency values ranging from .91 to .92 for the total SEI. Similar reliability findings were reported by Betts et al. (2010) when correlations between factors were examined (i.e., .74 for TSR, .70 for CRSW, .76 for PSL, .80 for FG, and .79 for FSL) for a large sample of students in grades 6 through 12.

Validity of the SEI has been explored through studies examining the proposed factor structure of the instrument, its link to hypothesized outcomes, and its relationship with other similar instruments. Appleton et al.'s (2006) initial study introduced the SEI and, as mentioned above, a six-factor model emerged through exploratory and confirmatory factor analyses. A five-factor structure (excluding the Extrinsic Motivation subscale) was confirmed for students of both genders, in grades 6 through 12 (Betts et al., 2010), for students with learning, speech, and behavior disabilities, students who had dropped out of high school (Lovelace et al., 2012), and high school students from diverse economic and ethnic backgrounds (Reschly, Betts, & Appleton, 2012). In addition, all but one of the SEI subscales had positive relationships with grades and achievement test scores and negative relationships with suspension (Appleton et al., 2006). The one exception was the CRSW (cognitive engagement) scale, which was negatively correlated with achievement test scores and positively correlated with school suspensions. This

finding was replicated by Spanjers (2007), who also found a positive relationship between the FG scale and achievement test scores and a negative relationship between achievement test scores and scores on the CRSW. Lovelace et al. (2012) further found that students who dropped out of high school and/or had low behavioral engagement also had low scores on the SEI.

Reschly et al. (2012) provided evidence of the convergent and divergent validity of the SEI. They examined the relationship of the SEI with a scale measuring related constructs, the Motivation-Engagement Scale (Martin, 2007). They also examined the relationships of each of the scales with student behaviors related to engagement including student-reported time dedicated to homework, grades, and behavioral problems (i.e., discipline referrals, skipping class, fighting, suspension/expulsion). The results of their study were generally consistent with the theoretical framework behind the SEI. SEI scales were positively correlated with MES measures of cognitive and behavioral engagement and student-reported time spent on homework and negatively correlated with MES measures of cognitive and behavioral disengagement and student behavior problems (Reschly et al., 2012). Moreover, the cognitive scales of the SEI, which theoretically should have been more strongly related to MES engagement scales, were, indeed, mostly more highly correlated with MES engagement scales than SEI affective engagement scales (Reschly et al., 2012).

Behavioral Engagement. A composite of the number of absences and tardies, converted to percent relative to days enrolled, behavioral incidents, in school suspension days, out of school suspension days, and number of hours devoted to extracurricular activities per week were used to represent behavioral engagement (c.f., Reschly & Christenson, 2006a; Lovelace et al., 2012). This information was obtained from the district's archival records.

Achievement. Achievement measures were used for three separate purposes: (a) to classify students as underachievers and high achievers, (b) to classify students as gifted, and (b) as a covariate in predicting high school dropout. For the first purpose, achievement was measured using student pseudo GPA (0-100 scale, described above), current as of the end of the 2010-2011 academic year. Reading, Math, and Total composite scores on the ITBS were used to classify students as gifted. As mentioned above, the ITBS is a standardized, nationally normed, group-administered instrument used for measuring the academic achievement of students in kindergarten through eighth grade (Englehard & Lane, 2007). Studies support the reliability and validity of the instrument, and the ITBS was most recently normed in 2000 on a random sample of 246, 000 students in the kindergarten through eighth grade (Englehard & Lane, 2007). The sample was chosen to be representative of the student population in terms of demographic variables, geographic location, district size, and public/private school setting (Englehard & Lane, 2007). Several test levels corresponding to different grade levels are available (Riverside Publishing Company, 2010). In the case of the district data used in this study, levels nine through 14, corresponding to grades three through eight, are of relevance. The ITBS is given to students in the district in the third, fifth, and eighth grades. The complete battery includes a Reading composite (Vocabulary and Reading Comprehension), a Math composite (Concepts and Estimation, Problem Solving and Data Interpretation, and Computation), a Language Composite (Spelling, Capitalization, Usage and Expression, and Punctuation), a Science test, a Social Studies test, a Uses of Information composite (Reference Materials and Maps and Diagrams), a Word Analysis test, and a Listening test, all of which form the Complete Composite (Riverside Publishing Company, 2010).

Regarding the final purpose, students' most recent performance on the Mathematics and Reading portions of the Criterion-Referenced Competency Test (CRCT) was used as a marker of student achievement during the 2007-2008 academic year. The CRCT is a criterion-referenced, multiple-choice instrument, used by the state of Georgia to index students' progress in the Georgia Performance Standards each year [Georgia Department of Education (GADOE), 2012]. Tests are given in Mathematics, Reading, English/Language Arts, Science, and Social Studies. From the Spring of 2000 through the Spring of 2011, all students in the first through eighth grades in the state of Georgia took the CRCT (GADOE, 2012). Students in the first and second grades took only the core academic area tests (Reading, Mathematics, and English/Language Arts) and students in the third through eighth grades took the core area tests as well as the Science and Social Studies content area tests (GADOE, 2012). Table 4 summarizes the information covered by each CRCT core and content area. In the case of this study, data for the greatest number of students during the 2007-2008 academic year were available on the CRCT. CRCT scores were obtained from the district's archival records.

Regarding psychometric data, evidence of content validity for the CRCT was established through peer review by experts from the United States Department of Education (GADOE, 2012). Reported internal consistency values range from .86 to .89 for the reading subtest and .91 to .93 for the mathematics test (GADOE, 2008).

Table 4

CRCT Content Areas

Content Area	Domains Covered	Grade Levels
English/Language Arts (GADOE, 2007a)	Grammar	1-8
	Phonological Awareness	1
	Phonics	1-2
	Sentence Construction	1-8
	Research	2-8
	Writing Process	8
Mathematics (GADOE, 2009a)	Numbers and Operations	1-8
	Measurement	1-6
	Geometry	1-8
	Algebra	3-8
	Data Analysis and Probability	1-8
Reading (GADOE, 2007b)	Vocabulary	1-2
	Comprehension	1-2
	Reading Skills and Vocabulary Acquisition	3
	Literary Comprehension	3-8
	Reading for Information	3
	Information and Media Literacy	4-8
Science (GADOE, 2007c)	Earth Science	3-6
	Life Science	3-5,7
	Physical Science	3-5, 8
Social Studies (GADOE, 2009b)	History	3-8
	Geography	3-8
	Government/Civics	3-8
	Economics	3-8

CHAPTER 4

STUDY 2 RESULTS

Initial Analyses

Data Screening of the Student Engagement Instrument

Prior to conducting analyses to address the research questions, SEI data from 2007-2008 and 2010-2011 were screened for missing values and any non-random patterns of missing values [based on ethnicity, socioeconomic status (operationalized eligibility for free/reduced-price lunch), gender, dropout status, and underachiever status]. For each participant, items were coded for missing values (1 = yes, 0 = no) and chi-square tests were conducted examining the relationships between missing values and ethnicity, socioeconomic status, gender, dropout status, and underachiever status (c.f., Lovelace et al., 2012). No significant relationships were found between missing values and the predictor variables ($V \leq .095$ for all tests[1]) for either dataset. Participants who completed less than 75% of SEI items (i.e., less than 25 of 33 items) were excluded from analyses (Lovelace et al., 2012). For completed questionnaires with missing values not exceeding 25% (8 items), median values for the overall sample were substituted for missing values (c.f., Appleton et al., 2006; Lovelace et al., 2012).

Item analyses, including examinations of the frequency distributions for the SEI items and the mean, standard deviation, skewness, and kurtosis of the items, also were conducted. No items in the 2007-2008 or 2010-2011 datasets exceeded skew and kurtosis absolute values of 3.0 and 8.0, respectively (Kline, 2005). Skew values ranged from -2.407 to .623 and kurtosis values

[1]For Cramer's V, values are interpreted as follows: .10-.30—small effect, .30-.50—medium effect, greater than .5—large effect.

ranged from -.499 to 6.798 for the 2010-2011 dataset. For the 2007-2008 dataset, skew absolute values ranged from -2.474 to .724 and kurtosis values ranged from -.325 to 7.044. In both datasets, the majority of the items were negatively skewed, with most responses falling in the middle to higher end, indicating highly rated engagement. Two items, 18 ("I feel like I have a say about what happens to me at school") and 32 ("When something good happens at school, my family/guardian(s) want to know about it"), were positively skewed in both datasets, indicating that most participants endorsed disagreement with these items (Appleton et al., 2006, p. 436). In the 2010-2011 dataset, most of the items' standard deviations were lower than 1 and several were lower than .8, indicating low variability in item responses in this sample (Bandalos, 2007). In the 2007-2008 dataset, all of the items' standard deviations were lower than 1 and all but one (item 28) were lower than .8.

Preliminary Analyses

Participants in this study came from 53 schools in the county and were disproportionately distributed across these schools such that some schools had over 1,000 participants and some had only 1 participant. Prior to conducting the analyses, one-way analyses of variance (ANOVA) were completed with the cognitive and affective engagement variables for the 2010-2011 academic year entered as the dependent variable and the school location entered as the independent variable to determine if differences needed to be examined at the school level.[2] One-way ANOVAs revealed non-significant relationships between school location and TSR, F (47, 2910) = 1.139, p = .24, CRSW, F (47, 2910) = 1.078, p = .333, PSL, F (47, 2910) = 1.289, p = .091, FA, F (47, 2910) = .959, p = .552, and FSL, F (47, 2910) = 1.047, p = .386. Therefore, participants were collapsed across schools for these variables. Most of the behavioral

[2] Based on analysis approach in an anonymous article being reviewed for publication (A. Reschly, personal communication, December 12, 2012).

engagement variables, with the exception of extracurricular involvement, required non-parametric tests (described below) and as such, these comparisons could not be completed. A one-way ANOVA with the number of hours of weekly extracurricular involvement entered as the dependent variable and school location entered as the independent variable was significant, F (50, 13,522) = 10.38, p = .000; however, once grade level and other covariates (ethnicity, SES, and gender) were included in the model, the effect size was negligible ($\eta_p^2 < .01$). Thus, participants were collapsed across schools for this variable as well.

Research Question 1: Demographic characteristics

The first research question of this study dealt with the demographic characteristics of gifted dropouts and underachievers. Out of the total gifted sample, approximately 13% of the gifted students were underachievers and 0.3% were non-graduates. Within the high school gifted population (17,921 students), approximately 0.5% of the students (89) were non-graduates. The demographic characteristics of gifted underachievers and non-graduates are summarized in Tables 1 and 2, respectively. Consistent with Colangelo et al.'s (1993) findings, the majority of underachieving gifted students were male (approximately 68%) and ineligible for free or reduced price lunch (approximately 56%). In terms of ethnicity, a little less than half of gifted underachievers were White (approximately 45%), approximately 22% were African American, approximately 20% were Hispanic, approximately 7% were Asian/Pacific Islander, approximately 5% were multiracial, and less than 1% were Native American/Alaskan Native. Of the 108 gifted non-graduates, demographic characteristics were similar. The majority (70%) were male, White (52%) and ineligible for free or reduced price lunch (approximately 62%).

Research Question 2: Comparing Student Engagement Between Gifted Underachievers and Non-graduates

The second research question dealt with whether student engagement differs between gifted underachievers and gifted non-graduates. Prior to comparing engagement among gifted underachievers and dropouts, chi-square analyses were conducted to ensure groups were approximately equivalent in terms of gender, race, and socioeconomic status. The chi-square tests did not reveal statistically significant differences. Specifically, a 2 (dropout, underachiever) X 2 (male, female) chi-square test was not statistically significant [χ^2 (1, n = 4,300) = .081, p = .776]. A 2 X 6 (White, African American, Asian/Pacific Islander, Hispanic, Multiracial, Native American/Alaskan Native) chi-square test was not statistically significant [χ^2 (5, n = 4,300) = 6.808, p = .235]. Finally, a 2 X 2 (free or reduced lunch, no free or reduced lunch) chi-square test was not statistically significant [χ^2 (1, n = 4,300) = 1.752, p = .186].

Cognitive Engagement

Independent sample t-tests were conducted to compare levels of cognitive engagement between gifted underachievers and non-graduates. Bonferroni adjustments were used to correct for inflated Type 1 error for multiple comparisons, with alpha set at .01. Levene's test for homogeneity of variance was used to test for equal variances between groups. For FG, the variances between groups were approximately equal between underachievers and non-graduates. For CRSW, Levene's test revealed unequal variances. To adjust for the threat of unequal variances on Type 1 error, alpha was reduced to .025 (Keppel & Wickens, 2004), or .005 with the Bonferroni adjustment for CRSW, and t-tests with equal variances not assumed were carried out. Independent samples t-tests revealed statistically significant differences between underachievers and non-graduates, t (62.493) = 2.916, $p < .005$ and t (2,956) = 2.958, $p < .005$

for CRSW and FG, respectively. Underachievers reported higher CRSW (M = 32.127, SD = 4.858) and FG (M = 18.219, SD = 3.582) than non-graduates (CRSW M = 29.726, SD = 6.446; FG M = 16.855, SD = 4.109). Based on Cohen's (1988) guidelines, effect sizes for these differences were small for CRSW (d = .14) and FG (d = .11).

Affective Engagement

The same procedures described above were used to compare gifted underachievers and non-graduates on levels of affective engagement. Bonferroni adjustments were used to correct for inflated Type 1 error for multiple comparisons, with alpha set at .01. Levene's test for homogeneity of variance revealed approximately equal variances for FSL and unequal variances for PSL and TSR. To adjust for the threat of unequal variances on Type 1 error, alpha was reduced to .025, or .005 with Bonferroni adjustment for TSR and PSL (Keppel & Wickens, 2004) and t-tests with equal variances not assumed were carried out. Independent samples t-tests revealed a non-significant difference between underachievers (M = 13.509, SD = 2.388) and non-graduates (M = 12.774, SD = 2.837) for FSL, t (2,956) = 2.388, p = .017. Underachievers (TSR M = 33.237, SD = 5.355; PSL M = 23.407, SD = 3.6310) reported statistically significantly higher affective engagement than non-graduates (TSR M = 30.371, SD = 7.104; PSL M = 21.0436, SD = 4.789) for both TSR, t (62.493) = 3.157, $p < .005$, and PSL, t (62.510) = 3.221, $p < .005$. However, effect sizes for TSR and PSL were small (d = .15 for both).

Behavioral Engagement

Preliminary analyses of behavioral engagement data revealed that the groups were extremely skewed with regard to attendance, behavioral incidents, and suspension. That is, the vast majority of participants had 0 or very few absences, tardies, behavioral incidents, and

suspension days. As the assumption of normal distributions was violated, data were ranked, described below, and non-parametric tests were performed (Keppel & Wickens, 2004).

Attendance. Attendance data were ranked based on categories used by the school system; five or fewer absences, six to ten absences, 11 to 15 absences, and 16 or more absences. For the purposes of this study, students' combined percentages of days absent or tardy out of total days enrolled (180 days) were mapped on to the district's categories (2.8% or less – low, 2.9% to 5.5% - medium, 5.6% to 8.3% - high, and greater than 8.3% - very high). A 2 (underachiever, dropout) X 4 (low, medium, high, very high) chi-square test revealed a statistically significant, small difference in the how underachievers and non-graduates were distributed among the attendance categories, χ^2 (3, 2,958) = 102.064, $p < .001$, $V = .186$. The observed frequencies are listed in Table 5. All possible follow-up pairwise comparisons were completed with Bonferroni adjustments for family-wise error rate. Alpha was set at .008. These results are detailed in Table 6. Three of these analyses yielded statistically significant, small relationships. Overall, non-graduates (68%) were more likely than underachievers (17%) to fall in the very high absence/tardy group, and less likely to fall in the medium, high, or low groups. Fourteen percent of non-graduates fell in the low group, 13% fell in the medium group, and 5% fell in the high group. In contrast, 41% of underachievers fell in the low group, 28% fell in the medium group, 14% fell in the high group, and 17% fell in the very high group (see Table 5).

Table 5

Observed Frequencies of Underachievers and Non-graduates in Attendance Categories

	Attendance/Tardy Category				Total
	Low (5 or less)	Medium (6-10)	High (11-15)	Very High (16 or more)	
Underachiever	1,174 (40%)	800 (28%)	417 (14%)	505 (17%)	2,896
Non-graduate	9 (15%)	8 (13%)	3 (5%)	42 (68%)	62
Total	1,183	808	420	547	2,958

Table 6

All 2X2 Comparisons for Underachievers and Non-graduates in Attendance Categories

Attendance Category	Chi Square Results
Low, Medium	χ^2 (1, n = 1,991) = .09, p =.764
Low, High	χ^2 (1, n = 1,603) = .05, p = .823
Low, Very High	χ^2 (1, n = 1,730) = 62.72, p < .001, *V* = .20
Medium, High	χ^2 (1, n = 1,228) =.30, p = .863
Medium, Very High	χ^2 (1, n = 1,355) = 39.19, p < .0001, *V* = .17
High, Very High	χ^2 (1, n = 967) = 24.42, p < .0001, *V* = .16

Behavioral Incidents. The number of behavioral incidents each student accrued during the 2010-2011 academic year were ranked using the following categories: students with zero incidents were placed in the "none" category, students with one to five incidents were placed in the "low" category, students with six to ten incidents were placed in the "medium" category, and students with greater than ten incidents were placed in the "high" category. These categories were selected based on the number of incidents relative to the number of days in a school week. That is, students with 5 or fewer incidents had the equivalent of a week or less of behavioral

incidents. Students with 10 or fewer incidents had the equivalent of two or less weeks of behavioral incidents. A 2 (non-graduate, underachiever) X 4 (none, low, medium, high) chi-square analysis was not statistically significant, χ^2 (3, 2,956) = 4.99, p = .173. Underachievers and non-graduates had similar proportions of behavioral incidents (see Table 7).

Table 7

Observed Frequencies of Underachievers and Non-graduate in Behavioral Incident Categories

	Behavioral Incident Category				Total
	None (0)	Low (1-5)	Medium (6-10)	High (10 or more)	
Underachiever	1,465 (51%)	1,097 (38%)	219 (8%)	115 (4%)	2,896
Non-graduate	24 (40%)	24 (40%)	8 (13%)	4 (7%)	60
Total	1,489	1,121	227	119	2,956

In and Out of School Suspension. The number of in- and out-of-school suspension days each student accrued during the 2010-2011 academic year was ranked using the same categories described above for behavioral incidents. The rationale for these categories was similar to the rationale described above. For example, a student suspended for more than 10 days spent more than two school weeks out of the regular classroom, without regular instruction. A 2 (non-graduate, underachiever) X 4 (none, low, medium, high) chi-square analysis was statistically significant, χ^2 (3, 2,956) = 18.94, $p < .001$; however, the effect size for this relationship was negligible (V = .08), and fell below the criteria for a small effect. Thus, the relationship was not meaningful, indicating that underachievers and non-graduates had similar proportions of students with zero, low, medium, and high numbers of days suspended (see Table 8).

Table 8

Observed Frequencies of Underachievers and Non-graduates in Suspension Days Categories

	Suspension Days Category				Total
	None (0)	Low (1-5)	Medium (6-10)	High (10 or more)	
Underachiever	2,041 (70%)	593 (20%)	161 (6%)	101 (3%)	2,896
Non-graduate	31 (52%)	20 (33%)	2 (3%)	7 (12%)	60
Total	2,072	613	163	108	2,956

Extracurricular Involvement. An independent samples t-test was conducted to compare the number of hours per week devoted to extracurricular involvement by gifted non-graduates and underachievers. Levene's test of homogeneity of variance indicated approximately equal variances. Non-graduates (M = 7.76, SD = 19.31) and underachievers (M = 8.77, SD = 15.85) did not differ significantly in their extracurricular involvement, t (2,780) = .463, p = .64. It should be noted that a number of students reported an unlikely amount of extracurricular involvement. For example, 50 students reported spending 99 hours a week on extracurricular activities. These results may indicate a lack of honesty on the questionnaire or a misunderstanding of the question, and likely compromise the results.

Research Question 3: Comparing Student Engagement Between Gifted High Achievers and Gifted Underachievers

The third research question dealt with differences in student engagement between gifted high achievers and underachievers. Prior to comparing these groups, chi-square analyses were conducted to ensure groups were approximately equivalent in terms of gender, race, and socioeconomic status. All chi-square tests revealed statistically significant differences between groups. Specifically, a 2 (high achiever, underachiever) X 2 (male, female) chi-square test for

gender was statistically significant, with a small effect size [χ^2 (1, n = 11,911) = 570.39, $p < .001$, $V = .22$]. A 2 X 6 (White, African American, Asian/Pacific Islander, Hispanic, Multiracial, Native American/Alaskan Native) chi-square test for ethnicity also was statistically significant, with a small effect size [χ^2 (5, n = 11,911) = 681.14, $p < .001$, $V = .24$]. Finally, a 2 X 2 (free or reduced lunch, no free or reduced lunch) chi-square test for socioeconomic status was statistically significant, with a small effect size [χ^2 (1, n = 11,911) = 498.68, $p < .001$, $V = .21$]. Given these differences, one-way analyses of covariance (ANCOVA) were conducted, with each of the engagement variables entered as dependent variables, status as an underachiever or a high achiever entered as the independent variable, and gender, ethnicity, and socioeconomic status entered as covariates.

Cognitive Engagement

Levene's test for homogeneity of variance revealed unequal variances for CRSW and FG. To adjust for the threat of unequal variances on Type 1 error, alpha was reduced to .025, or .005, with Bonferroni adjustment (Keppel & Wickens, 2004). A one-way ANCOVA yielded a statistically significant difference with a medium effect between underachievers' ($M = 32.13$, $SD = 4.86$) and high achievers' ($M = 34.88$, $SD = 3.91$) ratings of CRSW, F (1, 11,906) = 802.40, $p < .001$, $\eta_p^2 = .063$, with the covariates taken into account. In addition, socioeconomic status also had a statistically significant effect on CRSW, F (1, 11,906) = 21.33, $p < .001$; however, the effect size was miniscule ($\eta_p^2 = .002$). Similarly, underachievers ($M = 18.22$, $SD = 3.58$) and high achievers ($M = 19.92$, $SD = 3.20$) differed significantly on FA, F (1, 11,906) = 479.38, $p < .001$, with covariates taken into account. The effect size for this difference was small, $\eta_p^2 = .04$. There was also a statistically significant, but very small, effect for gender, F (1, 11,906) = 52.34, $p < .001$, $\eta_p^2 = .004$.

Affective Engagement

Levene's test for homogeneity of variance revealed unequal variances for TSR, PSL, and FSL. To adjust for the threat of unequal variances on Type 1 error, alpha was reduced to .025, or .005, with Bonferroni adjustment (Keppel & Wickens, 2004). A one-way ANCOVA revealed a statistically significant difference between underachievers (M = 33.24, SD = 5.35) and high achievers (M = 36.08, SD = 4.67) in their ratings of TSR, F (1, 11,906) = 620.97, $p < .001$, with a medium effect ($\eta_p^2 = .050$), after the covariates were taken into account. There was also a significant difference for gender, F (1, 11,906) = 27.83, $p < .001$, with a very small effect ($\eta_p^2 = .002$). Similarly, ratings of PSL differed significantly between underachievers (M = 23.41, SD = 3.63) and high achievers (M = 25.39, SD = 3.02) with a medium effect, F (1, 11,906) = 679.516, $p < .001$, $\eta_p^2 = .054$), with the covariates taken into account. PSL also varied significantly by gender, F (1, 11,906) = 28.76, $p < .001$, and socioeconomic status F (1, 11,906) = 7.73, $p < .005$; however, effect sizes for both were negligible ($\eta_p^2 = .002$ and .001, respectively). Finally, there was a statistically significant difference between underachievers (M = 13.51, SD = 2.39) and high achievers (M = 14.23, SD = 1.91) ratings of FSL with covariates taken into account, F (1, 11,906) = 272.01, $p < .000$. The effect size for this relationship was small, $\eta_p^2 = .022$). Although FSL ratings also varied by ethnicity, F (1, 11,906) = 11.90, $p < .001$, the effect size for this relationship was very small, $\eta_p^2 = .001$.

Behavioral Engagement

Attendance. Attendance data were ranked in the same manner described above. Several 2 (underachiever, high achiever) X 4 (low, medium, high, very high absence/tardy rate) chi-square tests were performed, with data layered by gender, ethnicity, and socioeconomic status. All chi-square tests were statistically significant with similar effect sizes when the data were

layered by the demographic variables; as such, a single chi-square test of the entire group was conducted. The overall 2 X 4 test revealed a statistically significant, medium relationship between status as an underachiever or high achiever and absence/tardy ranking, χ^2 (3, 11,911) = 1764.67, $p < .001$, $V = .39$ (see Table 9 for observed frequencies). All pairwise comparisons were conducted, with alpha set at .008 with a Bonferroni adjustment. All of the pairwise comparisons were statistically significant, with at least small effect sizes (see Table 10). Two of the comparisons had medium effect sizes; when underachievers and high achievers were compared in the low and very high groups and the medium and very high groups. Overall, a higher percentage of the underachievers were in the medium (28%), high (14%) and very high (17%) tardy/absence groups than the high achievers (18%, 4%, and 2%, respectively), and lower percentage of the underachievers were in the low tardy/absence group (41%) than the high achievers (76%).

Table 9

Observed Frequencies of Underachievers and High Achievers in Attendance Categories

	Attendance/Tardy Category				Total
	Low (5 or less)	Medium (6-10)	High (11-15)	Very High (16 or more)	
Underachiever	1,174 (41%)	800 (27%)	417 (14%)	505 (17%)	2,896
High Achievers	6,810 (76%)	1,643 (18%)	397 (4%)	165 (2%)	9,015
Total	7,984	2,443	814	670	11,911

Table 10

All 2X2 Comparisons for Underachievers and High Achievers in Attendance Categories

Attendance Category	Chi Square Results
Low, Medium	χ^2 (1, n = 10,427) = 395.58, p < .0001, V = .19
Low, High	χ^2 (1, n = 8,798) = 662.75, p < .0001, V = .27
Low, Very High	χ^2 (1, n = 8,654) = 1,451.07, p < .0001, V = .41
Medium, High	χ^2 (1, n = 3,257) =88.32, p < .0001, V = .16
Medium, Very High	χ^2 (1, n = 3,113) = 390.65, p < .0001, V = .35
High, Very High	χ^2 (1, n = 1,484) = 90.03, p < .0001, V = .25

Behavioral Incidents. Behavioral incidents were ranked in the same manner as detailed above. Several 2 (underachiever, high achiever) X 4 (none, low, medium, high) chi-square tests were performed, with data layered by gender, ethnicity, and socioeconomic status. All chi-square tests were statistically significant with similar effect sizes when the data were layered by the demographic variables; as such, a single chi-square test of the entire group was conducted. The omnibus 2 X 4 chi-square test was statistically significant, with a large effect size, χ^2 (3, 11,911) = 2960.98, p < .001, V = .50 (see Table 11 for observed frequencies). All pairwise comparisons were conducted, with alpha set at .008 with a Bonferroni adjustment. The results are listed in Table 12**.** All comparisons were statistically significant, with the exception of the comparison between the medium and high groups, which contained less than 10%, each, of the underachievers, and less than 1%, each, of the high achievers. The comparisons between the low and high groups, the low and medium groups, and the none and high groups were all statistically significant, with small effects. The comparisons between the none and low groups and the none and medium groups were statistically significant with medium effects. The vast majority of high achievers had no behavioral incidents (93%), approximately 7% fell in the low category, and less

1% fell in the medium and high groups. In contrast, about half of underachievers (51%) had no behavioral incidents, 38% fell in the low category, 8% fell in the medium category, and 4% fell in the high group.

Table 11

Observed Frequencies of Underachievers and High Achievers in Behavioral Incident Categories

	Behavioral Incident Category				Total
	None (0)	Low (1-5)	Medium (6-10)	High (10 or more)	
Underachiever	1,465 (51%)	1,097 (38%)	219 (8%)	115 (4%)	2,896
High Achievers	8,404 (93%)	598 (7%)	11 (<1%)	2 (<1%)	9,015
Total	9,869	1,695	230	117	11,911

Table 12

All 2X2 Comparisons for Underachievers and High Achievers in Behavioral Incident Categories

Behavioral Incident Category	Chi Square Results
None, Low	χ^2 (1, n = 11,564) = 2,083.54, p < .0001, V = .42
None, Medium	χ^2 (1, n = 10,099) = 1,039.19, p < .0001, V = .32
None, High	χ^2 (1, n = 9,986) = 598.28, p < .0001, V = .24
Low, Medium	χ^2 (1, n = 1,925) =85.69, p < .0001, V = .21
Low, High	χ^2 (1, n = 1,812) = 54.19, p < .0001, V = .17
Medium, High	χ^2 (1, n = 347) = 1.27, p = .26

In and Out of School Suspension. The composites of in- and out-of-school suspension days for each student during the 2010-2011 academic year were ranked in the same manner as detailed above. Several 2 (underachiever, high achiever) X 4 (none, low, medium, high) chi-

square tests were performed, with data layered by gender, ethnicity, and socioeconomic status. All chi-square tests were statistically significant with similar effect sizes when the data were layered by the demographic variables; as such, a single chi-square test of the entire group was conducted. The omnibus 2 X 4 chi-square test revealed a statistically significant relationship between status as an underachiever or a high achiever, $\chi^2 = 2{,}213.54$, $p < .001$, with a medium effect size, $V = .43$ (see Table 13 for observed frequencies). All possible pairwise comparisons were conducted, and alpha was set at .008, with a Bonferroni adjustment for multiple comparisons. The results are listed in Table 14. All comparisons were statistically significant, with the exception of the comparison between the medium and high groups, which contained less than 10%, each, of the underachievers, and less than 1%, each, of the high achievers. There was a medium effect for the comparison between underachievers and higher achievers in the zero and low groups, and all other statistically significant comparisons had small effect sizes. The majority of both underachievers (70%) and high achievers (98%) did not spend any days of the 2010-2011 academic year in- or out-of-school suspension; however, whereas very few high achievers had one or more days of suspension (2%), approximately a fifth of underachievers fell in the low group, 6% fell in the medium group, and 3% fell in the high group. Overall, underachievers had higher rates of suspension (in or out of school) than high achievers.

Table 13

Observed Frequencies of Underachievers and High Achievers in Suspension Days Categories

	Suspension Days Category				Total
	None (0)	Low (1-5)	Medium (6-10)	High (10 or more)	
Underachiever	2,041 (70%)	593 (20%)	161 (6%)	101 (3%)	2,896
High Achievers	8,863 (98%)	136 (2%)	13 (<1%)	3 (<1%)	9,015
Total	10,904	729	174	104	11,911

Table 14

All 2X2 Comparisons for Underachievers and High Achievers in Suspension Days Categories

Suspension Days Category	Chi Square Results
None, Low	χ^2 (1, n = 11,633) = 1,526.49, p < .0001, V = .36
None, Medium	χ^2 (1, n = 11,078) = 581.25, p < .0001, V = .23
None, High	χ^2 (1, n = 11,008) = 399.02, p < .0001, V = .19
Low, Medium	χ^2 (1, n = 903) = 11.95, p < .0001, V = .11
Low, High	χ^2 (1, n = 833) = 15.17, p < .0001, V = .13
Medium, High	χ^2 (1, n = 278) = 1.75, p = .19

Extracurricular Involvement. Levene's test for homogeneity of variance revealed unequal variances. To adjust for the threat of unequal variances on Type 1 error, alpha was reduced to .025 (Keppel & Wickens, 2004). An independent samples t-test revealed no statistically significant differences between underachievers' (M = 8.77, SD = 15.85) and high achievers' (M = 8.34, SD = 11.27) degree of extracurricular involvement t (11,487) = 1.57, p = .12. Given the lack of significant difference and the suspect nature of the data, described above, the covariates were not entered into the model.

Research Question 4: Predicting Gifted Dropout

The fourth research question dealt with the longitudinal prediction of dropping out. Specifically, this question sought to determine whether student engagement could predict which ninth grade gifted students would be classified as non-graduates three years later. To address the fourth research question, logistic regression analyses were conducted, with status as a non-graduate (yes or no) in 2010-2011 entered as the dependent variable, each of the engagement variables, measured in 2007-2008 entered as independent variables, and the following variables entered as covariates: reading and math performance on the CRCT in 2007, socioeconomic status, gender, and ethnicity (c.f., Reschly & Christenson, 2006a). Extracurricular involvement was not included in the models due to the potentially compromised nature of these data, discussed above. Five regression models were conducted. The first model included only the covariates. Three models were carried out with the covariates entered in block 1 and each of the engagement subtypes (cognitive, affective, behavioral) entered in block 2. A fifth model included all of the engagement variables and the covariates together (c.f., Reschly & Christenson, 2006a). In addition to predicting status as a non-graduate, the logistic regression calculations were also used to calculate the change in odds of being a non-graduate given changes in the independent variables, indexed by the odds ratio statistic [Exp(B)]. Odds ratio values greater than 1.0 indicate an increase in the likelihood of dropping for each unit increase in the predictor variable, such that an Exp(B) value of 2 would indicate that a student would be twice as likely to drop out (Burns & Burns, 2008).

All five models correctly classified 98.9% of the sample, but none of the models correctly classified any of the non-graduates (29 students). That is, all five models and the null model classified 0 of the students at non-graduates. In Model 1, the Wald test statistic indicated that

math CRCT performance and gender were significant predictors of group membership ($p < .05$). None of the affective or cognitive engagement variables were significant predictors in Models 2 and 3; however, PSL approached significance in Model 2 ($p = .07$). Attendance was a significant predictor of dropping out in Model 4, with a greater percentage of absences and tardies being associated with a greater likelihood being a non-graduate. When all variables were accounted for in the full model (Model 5), attendance was the only engagement variable that was a significant predictor ($p < .05$), and the odds ratio indicated that the odds of being a non-graduate increased as this variable increased. None of the predictor variables or covariates correctly identified the non-graduates. These results are detailed in Table 15.

Table 15

Logistic Regression Analysis results for Gifted Non-graduates

	Variable	Intercept	Standard Error	Wald Statistic	Df	*P*	Exp (B)
Mode 1: Covariates	CRCT Math	-.031	.010	10.539	1	.001*	.969
	CRCT Reading	-.002	.011	.019	1	.891	.998
	Free/Reduced Lunch Eligibility	.237	.482	.241	1	.623	1.267
	Gender	-1.203	.442	7.420	1	.006*	.300
	Ethnicity	-.243	.189	1.653	1	.199	.784
Model 2: Affective Engagement Variables	Teacher-Student Relationships	-.015	.082	.033	1	.857	.985
	Peer Support for Learning	-.217	.120	3.280	1	.070	.805
	Family Support for Learning	.228	.150	2.333	1	.127	1.257
Model 3: Cognitive Engagement Variables	Control and Relevance of School Work	-.091	.079	1.333	1	.248	.913
	Future Ambitions and Goals	-.018	.104	.031	1	.861	.982
Model 4:	Disciplinary	.163	.102	2.543	1	.111	1.177

Behavioral Engagement Variables	Incidents						
	In-School Suspension Days	.027	.191	.020	1	.888	1.027
	Out-of-School Suspension Days	-.257	.209	1.520	1	.218	.773
	Percentage of Days Absent or Tardy	12.828	4.755	7.278	1	.007*	372,624.259
Model 5: Full Model, Significant Variables	CRCT Math	-.027	.010	7.965	1	.005*	.973
	Gender	-1.193	.454	6.919	1	.009*	.303
	Percentage of Days Absent or Tardy	13.247	4.885	7.352	1	.007*	566,265.413

Note. Predictors that were significant at $p \leq .05$ level are denoted with a *.

Given the very small number of non-graduates, the same procedures described above were carried out to predict status as an underachiever or a high achiever in 2010-2011. These results are detailed in Table 16. The covariates correctly identified 85.4% of the students as high achievers or underachievers, and reading and math CRCT scores, socioeconomic status, and gender were significant predictors of group membership ($p < .005$). The addition of the affective engagement variables in Model 2 did not improve classification (84.7%). The Wald test statistic indicated that PSL was a significant predictor of status as a high achiever or underachiever, with higher ratings increasing the likelihood of being a high achiever. Model 3 predicted group membership with the same degree of success as the covariates (85.4%). CRSW was a significant predictor ($p < .005$), and increased the likelihood of being a high achiever. In Model 4, the prediction of group membership was increased to 87% with the addition of behavioral engagement variables. Disciplinary incidents and percentage of days absent and/or tardy significantly predicted group membership ($p < .001$), and decreased the likelihood of being a

high achiever. Model 5 was the most successful in classifying high achievers and underachievers, and 87.2% of the sample was correctly classified with all of the variables included. The following engagement variables were statistically significant: CRSW ($p < .005$), FSL ($p < .052$), disciplinary incidents ($p < .001$), and absences and tardies ($p < .001$). Increases in control and relevance of school work increased the likelihood of high achievement, and all of the other significant variables were associated with a decrease in the likelihood of high achievement. All of the models were more successful predicting status a high achiever (with success rates ranging from 95.6 to 96.6%) than as an underachiever (35.7% to 46.4%).

Table 16

Logistic Regression Analysis Results for Underachievers (n = 280) and High Achievers (n = 1,256)

	Variable	Intercept	Standard Error	Wald Statistic	df	*P*	Exp (B)
Mode 1: Covariates	CRCT Math	.045	.004	114.297	1	.000*	1.046
	CRCT Reading	.028	.005	28.690	1	.000*	1.028
	Free/Reduced Lunch Eligibility	-.580	.187	9.585	1	.002*	.560
	Gender	1.488	.164	82.414	1	.000*	4.427
	Ethnicity	.023	.066	.120	1	.729	1.023
Model 2: Affective Engagement Variables	Teacher-Student Relationships	.037	.036	1.060	1	.303	1.038
	Peer Support for Learning	.107	.053	4.036	1	.045*	1.113
	Family Support for Learning	-.045	.065	.471	1	.493	.956
Model 3: Cognitive Engagement Variables	Control and Relevance of School Work	.105	.036	8.638	1	.003*	1.110
	Future Ambitions and Goals	.046	.045	1.032	1	.310	1.047

Model 4: Behavioral Engagement Variables	Disciplinary Incidents	-.465	.086	29.220	1	.000*	.628
	In-School Suspension Days	.063	.217	.086	1	.770	1.065
	Out-of-School Suspension Days	-.010	.026	.160	1	.689	.990
	Percentage of Days Absent or Tardy	-17.514	3.269	28.700	1	.000*	.000
Model 5: Full Model, Significant Variables	CRCT Math	.040	.004	81.857	1	.000*	1.040
	CRCT Reading	.026	.006	21.608	1	.000*	1.026
	Free/Reduced Lunch Eligibility	-.421	.204	4.274	1	.039*	.657
	Gender	1.513	.179	71.245	1	.000*	4.541
	Control and Relevance of School Work	.164	.049	11.465	1	.001*	1.179
	Family Support for Learning	-.148	.076	3.802	1	.051*	.863
	Disciplinary Incidents	-.467	.086	29.638	1	.000*	.627
	Percentage of Days Absent or Tardy	-17.060	3.347	25.983	1	.000*	.000

Note. Predictors that were significant at $p \leq .05$ level are denoted with a *.

CHAPTER 5

DISCUSSION

Each year, a portion of students choose to leave school without completing their education. It has been estimated that as many of 25% of these students were at one point among the highest achieving of their peers, or gifted (Renzulli & Park, 2000, 2002). Although gifted students may seem to be the students least likely to be at risk for dropping out, studies indicate that gifted dropouts share a number of similarities with their non-gifted counterparts. They tend to leave for many of the same reasons as non-gifted students, including boredom, failure, family obligations, and poor attendance, among others (Cramond et al., 2007; Matthews, 2006; Renzulli & Park, 2000, 2002), and they suffer the same negative financial outcomes of dropping out (Shaw & Tallent-Runnels, 2007). Thus, it is reasonable to surmise that student engagement, an important component in current conceptualizations of dropout in the general education literature (Appleton et al., 2008; Christenson et al., 2008; Christenson et al., 2000; Reschly & Christenson, 2006a; Sinclair et al., 2003), also would be a significant component in understanding dropout among gifted students. The primary purpose of the present study was to examine the roles of cognitive, affective, and behavioral engagement in achievement and dropout behavior among gifted students. A secondary purpose was to delineate the demographic characteristics of gifted dropouts and underachievers using a broad definition of giftedness.

Demographically, the gifted dropouts and underachievers in this study were mostly white males, from middle class or higher socioeconomic backgrounds. With the exception of gender, this make-up differs from that of dropouts in the general population (Rosenthal, 1998;

Rumberger, 1995). Although ethnic minorities and students from low socioeconomic backgrounds were more heavily represented in the dropout and underachiever populations than the overall sample of gifted students, the majority of dropouts and underachievers did not fall in these groups. This difference may be attributable, in part, to the under-identification of minority students for gifted programs (Ford & Grantham, 2003). Even though students who had not formally been identified as gifted were included in the sample for this study, approximately half of the sample was comprised of identified gifted students.

Interestingly, even with the broad identification criteria used in this study, less than one percent (.3%) of the gifted students in this study could be classified as non-graduates. It is noteworthy that the outcomes of students who transferred out of the district are unknown; however, the vast majority of gifted students (98%) did not leave during the 2010-2011 academic year. A more sizable percentage (13%) of gifted students was classified as underachieving. The proportion of gifted non-graduates found in this study is smaller than that of prior research (i.e., Matthews, 2006; Renzulli & Park, 2000, 2002), which is surprising given that Matthews' (2006) study examined dropout in the highly gifted population, that is, students falling in the top five percent of their peers in terms of achievement and aptitude. One possible explanation for this finding is that gifted students, on the whole, are relatively resilient to the risk of dropping out. Another explanation may be the overall achievement culture of the district. That is, the event dropout rate for the general population in the district during the academic year examined was only about 3% (GCPS, 2012a).

The second and third research questions dealt with engagement levels in three groups of gifted students; high achievers, underachievers, and non-graduates. It was expected that high achievers would manifest the highest levels of engagement across all three areas (cognitive,

affective, and behavioral). Prior engagement research has suggested that the more latent forms of engagement, cognitive and affective, are indirectly related to dropping out (Archambault et al., 2009; Reschly & Christenson, 2006a). Behavioral engagement, in contrast, is more overt, and may mediate the relationship between cognitive and affective engagement and high school dropout (Archambault et al., 2009; Reschly & Christenson, 2006a).Thus, it was also expected that gifted students who were underachieving, but had not dropped out, would report similar rates of cognitive and affective engagement, but higher rates of behavioral engagement as compared to gifted non-graduates.

These hypotheses were partially borne out. Although significant differences were evident between underachievers and non-graduates in terms of some of the cognitive, affective, and behavioral engagement variables, the effect sizes associated with these differences were small. It appears that behavioral engagement did not differentiate underachievers and non-graduates any more so than cognitive and affective engagement. Underachievers and non-graduates differed to a small degree on the following engagement variables: attendance, teacher-student relationships, peer support for learning, control and relevance of schoolwork, and future goals and aspirations, with underachievers manifesting more favorable engagement. When underachievers and high achievers were compared, more sizable differences were evident. High achievers reported more favorable cognitive, affective, and behavioral engagement for all of the variables assessed[3], with at least medium effect sizes for all of the variables except for future goals and ambitions and family support for learning. Effect sizes for these two variables were small.

Finally, cognitive, affective, and behavioral engagement variables were examined as predictors of student outcomes three years later. It was hypothesized that cognitive engagement

[3] This discussion excludes extracurricular involvement, as the data for this variable were likely inaccurate.

variables would play a more prominent role in predicting outcomes than has been the case in prior research in special education populations and the general population (Archambault et al., 2009; Reschly & Christenson, 2006a). Owing to the small number of non-graduates, all of the prediction models calculated appeared to be successful, but none of the engagement variables or covariates successfully identified the non-graduates. In contrast, engagement variables were significant predictors of whether students would be classified as high achievers or underachievers three years later, with their present levels of achievement (CRCT performance) taken into account. In the separate models, control and relevance of school work, peer support for learning, days absent/tardy, in-school suspension days, and disciplinary incidents were all significant predictors of later achievement. Whereas cognitive and affective engagement variables did not appreciably improve correct prediction beyond what could be predicted by the covariates, the behavioral engagement variables added to prediction success. This finding is similar to Reschly and Christenson's (2006a) results with students with disabilities and Archambault et al.'s (2009) results with students in the general population. Clearly, behavioral engagement variables significantly interfere with all students' academic progress. Although the hypothesis regarding the role of cognitive engagement in predicting dropout for gifted students was not borne out, one cognitive engagement variable, control and relevance of school work, did significantly predict future achievement, even with behavioral engagement variables included in the model. Whether behavioral engagement mediates the relationship between cognitive and affective engagement could not be resolved by this study, but this hypothesized relationship seems plausible.

Overall, the results suggest that for gifted students, engagement variables are more successful in predicting and distinguishing between different levels of achievement than which

students will drop out. This finding may be due at least in part to the very small number of gifted dropouts identified in this study. Additionally, gifted dropouts and underachievers who did not complete the Student Engagement Instrument (e.g., those who were not present or chose not complete the questionnaire) may differ in important ways from those who did. It is also possible that for gifted students, engagement plays a larger role in promoting positive outcomes than differentiating among negative ones (i.e., dropping out, underachieving).

One important finding from this study involves the cumulative benefits of engagement. Not only are more engaged students are more likely to graduate from high school, it also appears that the brightest, highest achieving students are also the most engaged. In a group of students who all demonstrated aptitude for high achievement, the most engaged students were more likely to be working to that potential three years later. Even with current levels of achievement and other covariates taken into account, engagement variables, specifically peer support for learning, perceived control and relevance of school work, behavioral incidents, and days absent or tardy from school, were significant predictors of later high achievement.

Two interesting findings regarding engagement variables emerged from this study. First, family support for learning, an affective engagement variable, differed little, if at all, among the three groups of students. Although ratings on this subscale did differ between underachievers and high achievers, which is consistent with Appleton et al.'s (2006) findings, the relationship was smaller in magnitude than that of other engagement variables. This result is consistent with Landis and Reschly's (2012) literature review summation that gifted underachievers and dropouts across several studies reported receiving positive and supportive messages from family about education. This particular form of engagement may operate differently for gifted students compared to the general population and, as such, may not be as useful in predicting outcomes.

The second engagement variable that appeared to operate differently among gifted students is control and relevance of school work, a cognitive engagement variable. In two prior studies (Appleton et al., 2006; Spanjers, 2007) this variable was negatively associated with achievement, yet in the present study it was a significant predictor of higher achievement. This finding also is consistent with literature reviewed by Landis and Reschly (2012), suggesting that gifted students' interest in and perceived relevance of school work plays an important role in their achievement and academic decisions. This variable may have greater importance in the academic decisions of gifted students than non-gifted students.

Limitations

This study has several limitations that should be considered. First, the effect of school-level variables could not be accounted for with the behavioral engagement data. That is, the students in this study came from a number of different schools throughout the district. Although the effect of school was ruled out for the cognitive and affective engagement variables, the nature of the behavioral engagement data precluded analyses that could have accounted for the effect of school (i.e., hierarchical linear modeling). Missing data presented another limitation. Data were missing for close to half of the non-graduates, about a third of underachievers, and almost a quarter of high achievers in the 2010-2011 sample. The data were further reduced in the 2007-2008 sample by students who did not complete the SEI in 2007-2008 and students for whom CRCT data were not available. As noted above, students who did not complete the SEI due to absence or choice, particularly in the non-graduate and underachieving populations, may have differed in important ways from students who did complete the SEI. In addition to difficulties related to design and missing data, information about behavioral engagement variables was likely lost due to the use of non-parametric tests. This limitation was the most

detrimental at the lowest levels of behavioral engagement. That is, a very small number of students had extremely high numbers of days suspended, disciplinary incidents, and absences/tardies; these students were grouped together with students who had considerably fewer instances of these variables.

This study also has limitations with regard to definitions. The first of these limitations involves how some of the gifted students were identified for the study. Students included in the sample who had not already been identified by the district were those who scored at or above the 80th percentile on a standardized test of achievement. This definition allowed for identification based on only one facet of the gifted construct using a single score, when most states use a more multi-faceted approach to identification (McClain & Pfeiffer, 2012). In the state in which this study took place, achievement is one of four (ability, creativity, motivation) possible areas for gifted identification (Georgia State Board of Education Rule Education Program for Gifted Students, 1998). Although using the 80th percentile as a cut-off allowed for broader identification in one sense, the definition narrowed the gifted construct. Nonetheless, the definition relied on the data available from district archival records.

A related limitation is that this study did not differentiate within the gifted population. Gagné (1998, 2010) has proposed different "degrees" of giftedness (mildly, moderately, highly, exceptionally, extremely). Using these or similar distinctions within the population may have revealed additional information about student engagement among gifted students. Likewise, underachievers also were massed into a single group. However, it seems likely that there were differences in engagement between students with failing GPAs and those with high C averages.

Implications

The results of this study have a number of implications for practice. First and foremost, this study confirms what gifted educators, researchers, and advocates have stressed repeatedly for years; high academic aptitude is not a safeguard that will ward off negative outcomes and carry students to graduation and life success (e.g., Moon, 2009). Thirteen percent of the gifted students in this study were underachieving and close to 700 were failing. Although some gifted students will thrive with or without assistance from the school, some will require more. As such, a continuum of strategies aimed at maintaining and improving engagement should be targeted to all students. As noted above, among students who were all able to demonstrate high achievement, the most highly engaged students were the most likely to do so, while less engaged students were more likely to underachieve and drop out. Thus, although not all students will require the same type of interventions, all students can benefit in important ways from high engagement. Programs such as mentorships, authentic experiences, and challenging curriculum, all touted as gold standards in gifted service provision (Karnes & Bean, 2008), may assist in maintaining engagement in engaged gifted learners.

Gifted students demonstrating underachievement and low levels of engagement may require more intensive interventions. The results of this study demonstrated that the differences in engagement among gifted underachievers and non-graduates were small. Thus, underachieving gifted students, *even those who are passing*, may be at risk for dropping out and warrant intervention. Monitoring student engagement variables will likely assist in identifying gifted students who are at risk (Reschly & Christenson, 2006a; Reschly & Lovelace, 2010), but once these students are identified, it is imperative that they not then be discounted for follow-up because they are (a) gifted, and/or (b) maintaining passing grades. The most successful

interventions will likely be those targeted to a student's individual needs and profile, but principles of good engagement programs, such as personalized settings, incorporation of student interests, supportive school personnel, counseling, mentoring, and tutoring (Christenson & Thurlow, 2004; Dynarski & Gleason, 2002; McPartland, 1993), will likely be appropriate components.

Moreover, given the importance of control and relevance of school work to gifted students in this study, the decision to withdraw gifted services, or allow students to withdraw themselves, should be made with great care. In the state in which this study took place, students may be dismissed from the gifted program for failing to meet academic expectations (GADOE, 2011), and yet the research suggests that a lack of challenge may drive further disengagement and underachievement (Cramond et al., 2007, Hansen & Toso, 2007; Hébert, 2001; Kanevsky & Keighley, 2003). Although it is understood that state boards of education need to adopt standards for gifted students, educational professionals also must remember that participation in gifted classes and programs is not a special privilege; it is the provision of appropriate services based on academic need. When a student is not meeting the standards of a program, or chooses to withdraw him- or herself from his/her honors or advanced placement courses, talking to the student, discerning the reasons for withdrawal, and monitoring the situation may assist educators and parents in determining if this behavior is a sign of disengagement and warrants intervention.

Future Directions

One promising and exciting direction for future research is to further examine the benefits of high engagement. Reschly and Christenson (2012) have questioned whether there is a maximum threshold for the benefits of engagement. Gifted students may be an ideal sample for such research, as a large number do have positive outcomes. Following these students beyond

high school and examining post-secondary outcomes for different levels of engagement represents one potential direction for this research (c.f., Finn, 2006). Such a study would expand upon Finn's (2006) study of post-secondary outcomes in the general population by fleshing out whether engagement is a key variable in differentiating outcomes among the highest achieving students. College success, accomplishments, and involvement, future employment, and job satisfaction and success are possible outcome variables to examine (c.f., Finn, 2006). Another potential line of research is tracking the trajectory of student engagement among gifted students over time and identifying potential critical periods and experiences for student engagement. When do gifted students begin to disengage and underachieve? In the district in which this study took place, the SEI is given to every middle and high school student, and several years' worth of data are available. The development of the SEI-Elementary Version (Carter, Reschly, Appleton, Lovelace, & Thompson, 2012) may further aid in this research. Additionally, future research that employs a broad definition of the gifted construct could explore the potential impact that not being identified for gifted programming has on student engagement. Un-identified gifted students are less likely to receive instruction and services appropriate to their learning needs, and this may impact engagement.

A final course for future research is to examine the link between engagement and achievement and completion decisions in different types of gifted students. Cramond et al. (2007) have suggested that highly creative gifted students may experience unique difficulties in school. Whereas this study was achievement-focused, different results might have emerged with students identified on the basis of high creativity.

Conclusions

Preventing negative academic outcomes is a paramount goal for all students, including those deemed most likely to succeed. This study was the first to link the student engagement literature to achievement and dropout behavior among gifted students. It represents a first step in moving both lines of literature forward. For the gifted literature, although engagement is often referenced with regard to underachievement and high school dropout, this was the first known study to directly measure student engagement. In the engagement literature, this study demonstrates at least preliminary evidence that engagement may operate differently for gifted students, with cognitive engagement playing an important role, and family support providing less differentiation and predictive value. Continuing to refine our understanding of what variables affect student engagement and how student engagement, in turn, impacts academic achievement and decisions will aid in efforts to prevent negative outcomes and promote success for all students.

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