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High School Students in College-Level Classes: Associations Between Engagement, Achievement, and Mental Health

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High School Students in College-Level Classes: Associations Between Engagement, Achievement, and Mental Health

by

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Abstract

Student engagement is a multifaceted construct gaining increased interest within the fields of psychology and education. Current literature suggests that student engagement is linked to important student outcomes including academic achievement, psychopathology, and mental wellness; however, there is a dearth of studies that have examined all components of student engagement simultaneously as they relate to the aforementioned outcomes. Additionally, past literature has found support for a decreasing trend in student engagement across the school years, but less attention has been paid to student engagement in the high school years. Among high school students, a particular subgroup has been virtually ignored: high-achieving students enrolled in college-level curricula such as International Baccalaureate (IB) and Advanced Placement (AP). Research questions answered in the current study pertain to: (a) differences in the components of student engagement among IB and AP students, (b) differences in the components of student engagement of IB and AP students across grade level, (c) the extent to which student engagement relates to academic achievement, and (d) the extent to which student engagement relates to mental health. To answer these questions, self-report surveys and school records data from 727 IB and AP high school students were analyzed. Several main effects for program type and grade level were found among the various dimensions of engagement, as well as two interactions between program type and grade level. Regarding predictive relationships, results indicate that the linear combination of all seven indicators of student engagement accounted for 19.56% of the

variance in students' academic achievement, 17.47% of the variance in students' life satisfaction, and 6.17% of the variance in students' anxiety. Implications for school psychologists and future directions are discussed.

CHAPTER I: Introduction

Statement of the Problem

Student engagement is a multidimensional construct, consisting of academic, behavioral, cognitive, and affective components (Furlong & Christenson, 2008; Kortering & Braziel, 2008). Students who are more engaged with school and learning have better academic outcomes (Appleton et al., 2008; Betts, Appleton, Reschly, Christenson, & Huebner, 2010). Furthermore, student engagement has been linked to both positive and negative indicators of mental health. Low levels of student engagement have been associated with internalizing problems (e.g., depressive and anxious symptoms) as well as externalizing problems such as delinquency (Hirschfield & Gasper, 2011; Sander, Sharkey, Olivarri, Tanigawa, & Mauseth, 2010; Schochet, Dadds, Ham, & Montague, 2006). Regarding mental wellness, higher levels of engagement have been linked to greater positive affect and life satisfaction, whereas low levels of engagement are associated with negative affect and diminished life satisfaction (Lewis, Huebner, Malone, & Valois, 2011; Lewis, Huebner, Reschly, & Valois, 2009; Reschly, Huebner, Appelton, & Antarmian, 2008). Thus, student engagement has evidenced salient relationships with many student outcomes including academic achievement, psychopathology, and mental wellness. However, most research examining associations between student engagement and various outcomes has not examined all four domains of the student engagement construct simultaneously. This limitation precludes a complete understanding of how student engagement operates in relation to student outcomes.

Research has also indicated that levels of student engagement display a decreasing trend across the school years, such that students in elementary school are the most engaged in school and students in high school are the least engaged (Marks, 2000; Martin, 2009). Moreover, there is some evidence suggesting that student engagement decreases even across the four years spent in high school, such that seniors are the least engaged (Yazzie-Mintz, 2010). This gradual process of decreasing engagement as students progress through their schooling is a troubling phenomenon that merits attention.

While student engagement has been studied across developmental levels, there is a paucity of research on student engagement in the high school years. Within high school, a subgroup in need of particular attention involves high-achieving students who are enrolled in college-level curricula. Two increasingly common such curricula include the International Baccalaureate (IB) diploma program and Advanced Placement (AP) courses. While IB and AP differ in terms of requirements, with IB having a more demanding and coherent program of study, both programs place additional academic demands and expectations for performance on students. These added challenges may place students enrolled in IB and AP at risk for elevated levels of stress. Indeed, preliminary research suggests that IB students incur particularly high levels of stress, and that increased stressors (including in the academic domain) co-occur with lower life satisfaction and more psychopathology (Suldo, Shaffer, & Shaunessy, 2008; Suldo, Shaunessy, Thalji, Michalowski, & Shaffer, 2009). Elevated stress, a risk factor for increased psychopathology and decreased life satisfaction, may also have implications for lower student engagement. Specifically, lower life satisfaction and increased symptoms of psychopathology tend to be related to lower levels of student engagement (Hirschfield

& Gasper, 2011; Lewis et al., 2009; Lewis et al., 2011; Reschly et al., 2008; Sander et al., 2010; Schochet et al., 2006).

The literature on student engagement for students in IB and AP programs is virtually non-existent. Case in point, only two published studies examined any components of student engagement in students completing rigorous academic curricula, and only one of these included a subsample of IB students. These preliminary studies indicate that students enrolled in such programs experience *higher* levels of engagement in the behavioral, cognitive, and affective domains than their general education counterparts (Shaunessy, Suldo, Hardesty, & Shaffer, 2006; Yazzie-Mintz, 2010). More research is needed to determine if students in another rigorous academic program, specifically AP classes, have similarly high levels of engagement across the four domains of the construct (i.e., academic, behavioral, cognitive, affective). The differences in students' levels of engagement between these two programs should also be explored in order to further understand unique characteristics of students in two popular college-level curricula. Additionally, research in this understudied population is needed to establish the direction and magnitude of the relationships between the various domains of student engagement and student outcomes (e.g., GPA, life satisfaction, psychopathology).

Purpose of the Current Study

The purpose of the current study was to empirically examine all four components of student engagement (i.e., academic, behavioral, cognitive, affective) in high-achieving high school students, and examine how these dimensions of engagement relate to important student outcomes. As previous research has been limited by failing to measure all four domains of student engagement in high-achieving youth, the current study

contributes to the small amount of literature examining student engagement in this growing subgroup of learners. Specifically, the study examines differences between the dimensions of student engagement between students enrolled in IB programs and AP courses, two increasingly prevalent rigorous academic programs that have largely been ignored in the literature with respect to students' psychosocial functioning. Additionally, the study determined how student engagement differs across the four-year span of high school in this unique population. As previous research has indicated that there is a decreasing trend in engagement from 9th to 12th grade, this may yield valuable confirmatory information. Finally, this study provided insights into the relationships between the domains of student engagement, academic achievement, and indicators of mental health. Providing further information on how the dimensions of student engagement operate for students in college-level curricula in relation to achievement and mental health outcomes sheds light on the potential salience of this malleable factor (Kortering & Braziel, 2008), and suggest which students may be most at risk (and thus appropriate targets for prevention and intervention efforts) as a function of their status on the engagement dimensions that emerged from this study as uniquely predictive of student outcomes.

Definition of Key Terms

Student engagement. School engagement is a multidimensional construct, consisting of academic, behavioral, cognitive, and affective components (Furlong & Christenson, 2008; Kortering & Braziel, 2008).

Academic engagement. Academic engagement refers to the degree to which a student is involved with academic-related tasks and includes indicators such as time on

task, credit hours earned, and homework completion (Appleton et al., 2006; Jimerson et al., 2003).

Behavioral engagement. Behavioral engagement refers to the behaviors students actively engage in within the classroom and larger school settings and includes indicators such as attendance, suspensions, involvement in extra-curricular activities, participation in class activities and discussions, and following school rules (Appleton et al., 2008; Fredericks, Blumenfield, & Paris, 2004).

Cognitive engagement. Cognitive engagement refers to beliefs and mental processes associated with feeling connected to school and the learning process and includes indicators such as perceiving school as relevant to future goals, self-regulation of learning, and valuing school as important to one's goals (Appleton et al., 2006).

Affective engagement. Affective engagement refers to feelings and attitudes toward school and includes indicators such as feeling connected to the school, having a sense of belongingness, feeling supported by teachers and peers, interest in school, and positive feelings while at school (Appleton et al., 2008; Fredericks et al., 2004).

Academic achievement. Academic achievement refers to the degree to which students excel in school. It can be defined in many ways, but for the current study, the primary indicator was students' cumulative high school grade point average (GPA).

Life satisfaction. Life satisfaction is one of the three components of subjective well-being (SWB), which is a scientific term for happiness (Diener, 2000). Life satisfaction is considered a chief indicator of mental wellness (Cowen, 1994; Park; 2004) and is a global cognitive evaluation of one's happiness with his or her life on the whole (Diener, Lucas, & Oishi, 2002).

Anxiety. Anxiety refers to a type of internalizing psychopathology. Anxiety is a multidimensional construct comprised of cognitive (e.g., thinking bad things are going to happen), physical (e.g., increased heart rate, sweating, nausea), affective (e.g., feeling worried or scared), and behavioral (e.g., avoiding feared situations or objects) components.

High-Achieving. High-achieving in the current study refers to the type of student enrolled in rigorous college-level curricula, including Advanced Placement courses and International Baccalaureate programs. To gain access to these curricula, students typically must meet entrance requirements (e.g., minimum scores on state proficiency tests, grade point averages, grades in pre-requisite courses), and maintain high grade point averages in their coursework (e.g., A and B averages).

Research Questions

The current study answered the following research questions:

1. Do mean differences exist between students enrolled in Advanced Placement (AP) courses and students enrolled in International Baccalaureate (IB) programs in the following dimensions of student engagement:
    a. Academic
    b. Behavioral
    c. Cognitive
    d. Affective?
2. Do levels of student engagement (as defined above) differ significantly between high school students in 9th, 10th, 11th, and 12th grades, among:
    a. Students enrolled in AP courses?

b. Students enrolled in IB programs?

3. To what extent does student engagement (as defined above) relate to academic achievement, as defined by cumulative unweighted grade point average (GPA)?
4. To what extent does student engagement (as defined above) relate to the following indicators of mental health:
    a. Life satisfaction
    b. Anxiety?

Hypotheses

Regarding research question 1, it was hypothesized that mean differences would exist between students enrolled in IB programs and AP courses across all indicators of student engagement (i.e., academic, behavioral, cognitive, affective). Specifically, it was hypothesized that IB students would demonstrate significantly higher levels of student engagement than AP students for each of the components of engagement, in line with the higher entrance and completion requirements of this particular academic program (as summarized in chapter 2).

Regarding research question 2, it was hypothesized that for both groups of students (i.e., IB and AP), levels of student engagement would differ significantly across 9^{th}, 10^{th}, 11^{th}, and 12^{th} grades. Particularly, it was hypothesized that both groups of students would display a decreasing trend in engagement from the 9^{th} to 12^{th} grade, a finding established in prior research described in the subsequent chapter.

Regarding research question 3, it was hypothesized that student engagement would explain a statistically significant and large amount of variance in academic achievement (i.e., unweighted GPA), in line with the positive associations between these

two constructs. Based on the literature summarized in the next chapter, it was hypothesized that the affective and cognitive dimensions of engagement would evidence the highest associations with achievement.

Regarding research question 4, it was hypothesized that student engagement would explain a statistically significant and large amount of variance in life satisfaction and anxiety. In line with prior research on the magnitude of associations between student engagement and mental health (Lewis et al., 2009; Lewis et al., 2009; Reschly et al., 2008; Schochet et al., 2006), a higher association was anticipated with wellness (life satisfaction) than psychopathology (anxiety). The dimensions of engagement anticipated to show significant unique associations with positive and negative indicators of mental health include affective and cognitive engagement.

Importance of the Study to School Psychologists

Student engagement should be of concern to school psychologists due to the well-established relationships between school engagement and school completion and academic achievement (Betts, Appleton, Reschly, Christenson, & Huebner, 2010; Finn, 1989). Additionally, student engagement has been identified as a factor that is amenable to change, particularly through addressing school-based features such as the school environment, and student-teacher and peer relationships (Kortering & Braziel, 2008). By delineating specific dimensions of student engagement that link to students' academic achievement and mental health, this study aimed to provide an empirically-based rationale for where school psychologists should facilitate concerted prevention and intervention efforts. Furthermore, findings depict the positive benefits of student

engagement, even among a subgroup of students who are already excelling to the point that they are participating in college-level courses in high school.

Additionally, the current study uncovered differences between student engagement in students enrolled in two different college-level curricula, IB and AP. Gaining insight into the differences between these two groups of students in terms of student engagement permits school psychologists to understand unique characteristics of students in different rigorous curriculum options, and informs their approach to working with AP and IB students.

Contributions to the Literature

The current study adds to the available knowledge on the associations between all four dimensions of student engagement (i.e., academic, behavioral, cognitive, affective) and important IB and AP student outcomes, namely academic achievement (i.e., GPA) and psychological functioning (i.e., life satisfaction, anxiety). No known published study has examined all four dimensions of student engagement in a sample of high-achieving high school students, indicating the study provides a unique contribution to the literature. Furthermore, this study explored the differences in student engagement between students enrolled in IB programs and AP courses. The small amount of published prior research has focused more so on students in the IB program; the psychosocial functioning of students enrolled in AP classes has been less explored. Thus, the current study contributes to the knowledge of student engagement for students in both IB and AP classes. Finally, the associations between student engagement and mental health when mental health is defined comprehensively using both positive and negative indicators

(i.e., life satisfaction and psychopathology) have received limited attention in the literature, a gap that the current study addressed.

CHAPTER II: Review of the Literature

Student engagement is a multi-faceted construct that is of increased interest in the fields of education and psychology, primarily due to its relation to school dropout prevention and influence on academic achievement (Betts et al., 2010). Unlike many other factors that contribute to students dropping out of school, student engagement is a factor that can be amenable to change, particularly through addressing school-based factors (Kortering & Braziel, 2008). In other words, student engagement is an alterable variable that is impacted by teachers and the educational system at large, and increasing levels of student engagement can decrease students' likelihood of dropping out of school.

Among students who stay in school, there is accumulated evidence that greater student engagement is associated with better academic outcomes (Appleton et al., 2008). In addition to being studied in relation to preventing school dropout and improving academic achievement, student engagement has recently been studied in relation to social-emotional outcomes, such as positive affect. For example, students who reported more positive emotions related to their school experience also reported higher levels of engagement at school (Reschly et al., 2008). This chapter reviews the literature on the four major subtypes of student engagement, how engagement varies across developmental stages, the relationships between student engagement and assorted outcomes, and engagement in high-achieving high school students.

Defining Student Engagement

Over the years, student engagement has been conceptualized in many different ways. Its roots were formed within the school dropout research and the work of Finn (1989), who conceptualized student engagement as both identifying with, and participating in, school. Over the years, several other researchers have studied the construct of student engagement, albeit through different lenses. There is recent agreement that engagement as a construct involves both psychological (e.g., feeling connected to teachers and peers at school) and behavioral components (e.g., attendance; Furlong & Christenson, 2008). Furthermore, there is growing consensus that student engagement can be conceptualized as a construct involving four dimensions: academic, behavioral, cognitive, and affective/psychological components (Furlong & Christenson, 2008).

Academic engagement. Academic engagement can be defined as the degree to which a student is involved with academic-related tasks. This dimension includes variables such as time on task, credit hours earned, and homework completion (Appleton, Christenson, Kim, & Reschly, 2006; Jimerson, Campos, & Greif, 2003). Until recently, academic engagement was not consistently included as a component of the larger construct of student engagement, but practitioners have long been interested in the connection between academic engaged time and student achievement (Furlong & Christenson, 2008). As such, this dimension has gained more attention in the literature on student engagement. Students who spend more time academically engaged in learning are likely to experience more academic success and achievement (Gettinger & Ball, 2008).

This points to the need for the inclusion of academic engagement as a dimension to be considered under the larger umbrella of student engagement.

Behavioral engagement. The term behavioral engagement refers to active student behaviors within the school and classroom contexts and includes variables such as school attendance, suspensions, participation in extra-curricular activities, participation in classroom activities and discussions, and compliance with school and classroom rules (Appleton, Christenson, & Furlong, 2008; Fredericks et al., 2004). Behavioral indicators of student engagement, along with academic indicators, are considered to be the more directly observable subtypes of student engagement. Thus, behavioral engagement has been the most commonly defined and studied component of student engagement to date (Appleton et al., 2008; Jimerson et al., 2003).

Cognitive engagement. The dimension of cognitive engagement refers to beliefs and mental processes associated with feeling connected to school and learning. This dimension includes students' perceptions that school is relevant to their futures, students' personal values placed on their educational pursuits, self-regulation of their own learning, and personal educational goals (Appleton et al., 2006). Cognitive engagement is related to important academic outcomes such as grades, standardized test performance, and graduation (Appleton et al., 2008). Given its relationship with standardized test performance in an educational environment increasingly focused on student outcomes and performance on high-stakes tests, this component of engagement should not be overlooked.

Affective/psychological engagement. Affective engagement, sometimes called psychological engagement, is defined as students' feelings and attitudes toward school.

This dimension includes feelings connected to the schooling experience, having a sense of belongingness at school, and feeling supported by teachers and classmates (Appleton et al., 2008), as well as level of interest in learning, and feelings (e.g., happy, sad, anxious) while at school (Fredericks et al., 2004). These latter two subtypes of student engagement have been overlooked in the past due to their more internal nature and a lack of empirically-validated measurement options (Appleton et al., 2006). Initial research links both cognitive and psychological engagement to positive academic outcomes (Furlong & Christenson, 2008), which further lends support for studying them along with the academic and behavioral components of student engagement.

In sum, student engagement is a phenomenon increasingly being studied in the psychological and educational literatures, and appears to have four dimensions (academic, behavioral, cognitive, and affective). The next section provides an overview of student engagement across the elementary, middle, and high school years. Since the focus of the current study is high school students, a summary of research conducted on student engagement at the primary and middle school levels is provided for the reader's context, with more attention given to research with samples of high school students. For each developmental level, primary ways of measuring engagement are described, followed by a summary of trends and predictors of engagement as indicated by extant studies.

Student Engagement across Developmental Levels

The various dimensions of student engagement have been studied across students' academic careers, from elementary to high school. However, few researchers have taken on the daunting task of comparing levels of student engagement across the primary and

secondary levels of schooling within one study. To illustrate, only two such studies emerged through a review of this literature, one by Marks (2000) and another by Martin (2009). Results from a large U.S. sample of students in elementary, middle, and high school revealed that as students progress from elementary to middle to high school, their mean levels of engagement decrease (Marks, 2000). Specifically, elementary school students had the highest levels of engagement and high school students had the lowest levels of engagement, when engagement was operationalized as effort, attentiveness, lack of boredom, and work completion in class. These indicators cut across the four dimensions of student engagement.

In a separate study with a large sample of Australian youth across different stages of schooling, Martin (2009) reported similar results. Elementary school students were significantly more engaged than high school students with regard to the cognitive (e.g., valuing learning) and behavioral (e.g., management of learning tasks) dimensions of engagement. Clearly, there is a great need for more research comparing levels of student engagement across the stages of schooling. Given the paucity of studies aimed at accomplishing this goal, the review of the literature on student engagement is presented by level of schooling, as most studies included only one age group in their sample.

Student engagement in elementary school. Much of the student engagement work conducted to date with elementary aged students involves individuals other than the students themselves reporting the students' engagement at school. Regarding how engagement was assessed, many of these studies involve teacher-reported levels of engagement. For instance, Bodovski and Farkas (2007) used a 6-item teacher-report scale called "approaches to learning" to determine levels of student engagement in relation to

achievement in mathematics. The scale included items that appear to most closely tap the behavioral domain of engagement (e.g., persists at tasks). In a study examining the relationship among teacher-student relationships, engagement, and achievement, Hughes, Luo, Kwok, and Loyd (2008) also utilized teachers to assess engagement, specifically by teachers completing a 10-item scale consisting of items reflecting, to some degree, the behavioral (e.g., classroom participation) and academic (e.g., paying attention) components of student engagement. In order to classify first grade students into different engagement types, Luo, Hughes, Liew, and Kwok (2009) used the same teacher report measure as Hughes et al. (2008).

Other studies have assessed levels of student engagement through observational data. For instance, one study reported engagement as the amount of students who were either actively or passively participating in literacy activities using a three-point scale corresponding to the proportion of students actively engaged (Connor, Jakobsons, Crowe, & Meadows, 2009). Similarly, Lan et al. (2009) reported engagement on the classroom level as either on-task or off-task. For each 30-second interval observed during mathematics instruction, 70% of students had to be observed either actively or passively engaged with the learning task for at least 20 seconds in order to be considered on-task. As another example, Lutz, Guthrie, and Davis (2006) developed 4-point scales for each the affective, behavioral, cognitive, and social dimensions of engagement and then designated a rating for each of the dimensions per 30-second interval of reading instruction observed. Each student's ratings on the four dimensions of engagement were totaled to yield a total engagement score.

Some studies have used student self-report measures as a means of studying engagement, particularly for research with students in the upper-elementary grades. In a study examining how students' perceptions of the classroom social environment relate to engagement in mathematics, Patrick, Ryan, and Kaplan (2007) had students complete two short measures tapping into the cognitive dimension (Self-Regulated Learning; Ryan & Patrick, 2001) and behavioral dimension of student engagement. The authors developed the 5-item measure of behavioral engagement utilized in that study. In other studies, behavioral engagement has been assessed via student self-report on either a 5-item measure (developed by Wellborn & Connell, 1987) of their attention, effort, and participation in mathematics classes (Lau & Nie, 2008), and student self-report of their participation in small group instruction (Linnenbrink-Garcia, Rogat, & Koskey, 2011). Furrer and Skinner (2003) also measured behavioral and affective components of engagement via student self-report, via a 24-item measure they developed. As a final example, Perdue, Manzekse, and Estell (2009) utilized a 20-item self-report measure of engagement, adapted from a measure created by Simons, Johnson, Conger, and Elder (1998), designed to encompass the behavioral, affective, and cognitive components of student engagement.

A majority of the work conducted at this developmental level has primarily examined the academic and behavioral components of engagement. This may be the norm for a few reasons. First, academic and behavioral indicators of engagement, such as time on task, attendance, tardies, and participation in class discussions are more easily observable/reportable than the cognitive and affective indicators. Cognitive and affective indicators, which involve attitudes and feelings toward school and learning, are more

internal in nature. Thus, these dimensions of engagement are more readily assessed using self-report measures. Elementary school students are still developing the cognitive capabilities needed to accurately assess and report their internal thoughts, attitudes, and feelings. As such, students in elementary school may not be accurate reporters of their own levels of cognitive and affective engagement. In fact, only one study was identified in the literature that included students who self-reported these indicators of student engagement (Perdue et al., 2009), and these students were in their final year of elementary school.

With respect to findings regarding studies of student engagement during the elementary years, research has confirmed that students who have higher levels of engagement in learning have higher achievement across a variety of subject areas (Bodovski & Farkas, 2007; Hughes et al., 2008; Luo et al., 2009; Lutz et al., 2006). Also, students who perceive to have more social support at school (e.g., teacher and classmate support) tend to have higher levels of engagement (Furrer & Skinner, 2003; Patrick et al., 2007; Perdue et al., 2009). These associations may be bi-directional, in that higher levels of engagement may help maintain supportive relationships at school (Hughes et al., 2008).

Student engagement in middle school. In general, there is a paucity of research examining student engagement in the middle school years. Similar to the trend noted in the student engagement literature in elementary school, most of the studies with middle school samples have focused on the academic and behavioral components. However, unlike the norm of external reporters of student engagement (e.g., teachers, trained

observers) noted in studies of elementary school students, studies with middle school students typically rely on students' self-reports of their engagement with school.

As an example of the dimensions of engagement commonly studied, Kelly (2007, 2008) operationalized student engagement as active participation in classroom discussion (i.e., behavioral engagement) and work completion (i.e., academic engagement) in a study of engagement among students in English and language arts classrooms. The behavioral engagement data were collected through classroom observations using a computer software program called CLASS (trained researchers recorded and coded instances of students asking and answering questions in 120 classrooms during literature lessons for a total of four times throughout the school year) and the academic engagement data through self-report student questionnaires (completion of a 4-item scale of student effort created by the author). In Elmore and Huebner's (2010) research on the relationships between demographic characteristics, social relationships, student engagement, and school satisfaction, students completed the Assessment of Behavioral Dissatisfaction Scale (Roeser, Eccles, & Strobel, 1998) to index behavioral indicators of student engagement (i.e., withdrawal, resistant, and aggressive behaviors).

Two studies have examined student engagement subtypes beyond academic or behavioral. In addition to behavioral engagement, Wang and Holcombe (2010) investigated emotional (i.e., affective) engagement in terms of identifying with school, as well as cognitive engagement in terms of self-regulation of learning. These data were collected via student self-report on a 14-item measure originally developed by Eccles et al. (1993). Through student self-report on the Measure of Self-Regulated Learning (6-item measure adapted by the authors from the Motivated Strategies for Learning

Questionnaire; Pintrich, Smith, Garcia, & McKeachie, 1993), Ryan and Patrick (2001) researched both cognitive and behavioral engagement indicators in their study of motivation in middle school students.

With respect to findings relevant to student engagement during middle school, the studies identified above and other research has confirmed that high-quality, supportive relationships between students and significant others in their lives (e.g., parents, teachers, peers), as well as higher satisfaction with their schooling experience, are associated with higher engagement in school and learning (Elmore & Huebner, 2010; Ryan & Patrick, 2001; Wang & Holcombe, 2010). This is consistent with findings from the elementary school years. Another key finding from samples of middle school students suggests that students with more academic knowledge and skills are more engaged in classroom learning tasks than students with lower knowledge and skills (Kelly, 2007, 2008). This pattern is problematic and suggestive of "the rich get richer, and the poor get poorer" adage.

The transition to middle school has often been deemed a difficult one for students (Orthner, Akos, Rose, Jones-Sanpei, Mercado, & Woolley, 2010). Students are faced with increased demands and challenges, including transitioning to several classes throughout the day, meeting the expectations of more than one teacher, and navigating an increasingly complex social world. Couple these challenges with a middle school context that is mismatched to students' developmental needs and it can be understood how students tend to become more disengaged during the transition (Eccles, Lord, & Midgley, 1991). While some inroads have been made in empirically examining student engagement in middle school, no studies have examined all four dimensions of

engagement in combination for this population of students. Use of a comprehensive multi-dimensional framework would greatly contribute to the understanding of student engagement in the middle school years.

Student engagement in high school. While the importance of researching and understanding student engagement in the high school years is being increasingly emphasized (Appleton et al., 2006), there are still several barriers to doing so comprehensively. Two of the largest barriers include a lack of clarity about which components constitute student engagement, and few measurement tools to reliably measure the components of engagement (Appleton et al., 2008). The cognitive and affective dimensions of student engagement are particularly difficult to measure given their internal nature, but the availability of new psychometrically-sound instruments hold promise for measuring these components. After a brief discussion of primary self-report measures, the literature reviewed next highlights some of the more recent and relevant studies examining levels of student engagement in high school students. Studies selected for inclusion illustrate the different ways in which engagement has been conceptualized and studied among high school students.

Research in the past decade has focused on developing psychometrically-sound multidimensional self-report measures of engagement. As a part of the research and professional development project directed by the Center for Evaluation and Education Policy at Indiana University in Bloomington, the High School Survey of Student Engagement (HSSSE) has been available to schools since 2004 (Yazzie-Mintz, 2010). The HSSSE (for completion by students) measures three of the four dimensions of student engagement (i.e., cognitive, behavioral, affective). It was designed to provide

information on student engagement to high schools, as well as a mechanism to use to conduct research on student engagement in general. In 2009, 42,754 high school students in grades 9-12 from 27 different states across the nation completed the HSSSE. Participating schools receive a comprehensive data report, which details their students' responses on the survey in addition to how their students compare to HSSSE respondents at large. As expected, this very large and nationally representative sample yields extremely valuable data. For instance, regarding mean differences in levels of engagement, results from the 2009 administration of the HSSSE indicated sizable gaps across grade levels in terms of levels of student engagement (Yazzie-Mintz, 2010). Specifically, 9th grade students reported the highest levels of engagement across all three dimensions measured, with each subsequent grade level reporting lower levels of engagement, with 12th grade students reporting the lowest levels of engagement across all three dimensions. These results are commensurate with most past research indicating that as students progress through school, mean levels of student engagement decrease.

The Student Engagement Instrument (SEI; Appleton et al., 2006) is a newer measure that taps the affective and cognitive domains. It has been used successfully with high school students since its initial development (Appleton et al., 2006; Appleton et al., 2008; Betts et al., 2010; Lewis et al., 2009; Reschly et al., 2008). The SEI includes 35 items that comprise six subscales, three measuring psychological (e.g., affective) engagement and three measuring cognitive engagement. Appleton et al. (2006) report acceptable to good internal consistency for all six subscales (range of .72 to .88).

Another student self-report instrument that has been used with high school samples is the School Attitudes Assessment Survey-Revised (SAAS-R; McCoach &

Siegle, 2003a). The 35 items on the SAAS-R comprise five subscales, three that tap cognitive engagement and two that tap affective engagement. McCoach and Siegle (2003a) reported good to excellent internal consistency for all five subscales (range of .86 to .91). In part due to the strong psychometric properties, the SAAS-R has been used increasingly frequently as a means to studying high school students' beliefs and attitudes about their schooling experiences (McCoach & Siegle, 2003a; McCoach & Siegle, 2003b; Suldo et al., 2008).

Many studies of predictors of engagement in high school students have used brief researcher-developed unidimensional measures of constructs conceptually akin to a specific type of engagement. Case in point is a study examining student engagement from the theory of flow (i.e., full concentration on a task or activity that is also enjoyable; Csikszentmihalyi, 1990). Specifically, Shernoff, Csikszentmihalyi, Schneider, and Shernoff (2003) collected data from 526 high school students across the United States. The authors contend that when students are in a state of flow, they are fully engaged with the task at hand. Three self-report items tapping students' concentration, interest, and enjoyment in classroom activities were combined into a composite score of student engagement. The nature of these three items most closely reflects the cognitive dimension of student engagement. This study did not analyze differences in mean levels of engagement across grade levels, but several findings on factors related to student engagement were reported. Students reported higher levels of engagement when they perceived (a) a higher degree of challenge in their work, (b) their skill level as high, (c) high versus low control over situations, and (d) instruction as having high versus low relevance. Additionally, students reported higher levels of engagement during group

work, and during nonacademic subjects (i.e., computer science, art, vocational education) as compared to academic subjects (e.g., math, English, science). These findings suggest that in the high school years, engagement may be facilitated by the provision of active learning opportunities that include choices and highlights content relevance.

In a study designed to explore the relationship between students' perceptions of belonging, motivation, and cognitive engagement, Walker and Greene (2007) collected data from 249 high school students. The authors used the 18-item Psychological Sense of School Membership scale (PSSM; Goodenow, 1993) to measure belongingness, which closely mirrors affective engagement. The authors did not specify the instrument used to measure cognitive engagement, which is a limitation in this study. Results indicated that perceived instrumentality (i.e., viewing academic tasks as necessary for meeting future goals) and sense of belonging both emerged as significant predictors of higher cognitive engagement. Of note, perceived instrumentality, as defined in this study, resembles indicators included in the cognitive domain of student engagement.

You and Sharkey (2009) analyzed data from 13,825 students who participated in the National Education Longitudinal Study in order to determine which student and environmental factors impact student engagement over time. Data were collected when students were in the 8^{th}, 10^{th}, and 12^{th} grades. Student engagement was based on students' responses to three items (rated on a four-point Likert scale) that represent the dimension of behavioral engagement (e.g., "How often do you come to class and find yourself without pencil or paper?"). All items were reverse-coded, with higher scores indicating higher levels of engagement. Student engagement for eighth grade students was high; the mean score was 9.58 on a scale ranging from 3 to 12. Student engagement scores

increased approximately 0.27 per year across the four-year high school period. This is contradictory to what past research has reported (i.e., student engagement decreases over the course of schooling). However, You and Sharkey (2009) only studied the behavioral component of student engagement, which could explain the unique findings. Factors found to impact student engagement over time included individual student and school-level variables. Individual student factors that predicted higher levels of student engagement included: female gender, higher SES, traditional families (i.e., living with both biological parents), higher internal locus of control, positive self-concept, peers who value academic success, and higher previous academic grades. Regarding school-level factors, teacher support, sound instructional practices, and student/teacher ratio all emerged as significant predictors of student engagement.

In a study aimed at determining if perceptions of school climate predicted students' engagement and achievement, Ripski and Gregory (2009) examined data collected from a large sample of 10^{th} grade students as a part of the Educational Longitudinal Study of 2002. School climate characteristics primarily included students' perceptions of unfairness, hostility, and peer victimization at school. Student engagement was operationalized as teacher reports of students' behavioral engagement in their classrooms (e.g., "How often is this student attentive in your class?"). Several student demographic characteristics (e.g., SES, gender, race) predicted engagement. Specifically, higher engagement scores were evidenced among Caucasian girls from higher SES backgrounds. After controlling for demographic factors, students' perceptions of unfairness and victimization at school predicted decreases in engagement. These results support the relevance of, and the need to further study, affective indicators of student

engagement (e.g., feeling supported by individuals at school) in part to understand students' behavioral engagement.

Because student engagement is recognized as a malleable factor (Kortering & Braziel, 2008) linked to both school dropout and achievement (Betts et al., 2010), it is somewhat surprising that there is a dearth of studies that examine all four components of student engagement simultaneously. This limitation in the literature makes it difficult to have a complete understanding of student engagement in high school. More studies are needed to determine how student engagement differs, or may be unique, as students progress from 9th to 12th grade, although the most well-designed study to date indicates a likely decreasing trend across engagement dimensions (Yazzie-Mintz, 2010). In the context of the current, somewhat splintered state of the student engagement literature, efforts such as the HSSSE to study the phenomenon comprehensively (i.e., via focus on behavioral, cognitive, and affective engagement) among high school students are commendable. The development of empirically validated instruments such as the SEI and the SAAS-R also provide a means to more reliably and systematically study the multidimensional construct of student engagement in the future. The body of research summarized above indicates that correlates of engagement include demographic characteristics (e.g., gender, SES, family structure), perceiving school tasks as relevant and necessary to future goals and plans, possessing a sense of belongingness at school, feeling supported at school (e.g., by teachers and peers), and previous academic success.

Outcomes Associated with Student Engagement

Student engagement as a construct has been studied in conjunction with a host of outcomes, especially academic achievement, and to a lesser degree with variables

associated with psychological functioning. It is necessary to point out the fact that academic achievement has historically been studied as an outcome of student engagement in general, as well as more recently conceptualized as an indicator of the academic subtype of student engagement. There is still some inconsistency in the literature regarding whether achievement is most appropriately conceptualized as an indicator of academic engagement, an outcome variable, or both. Following is a summary of the pertinent links between student engagement and various outcomes.

Academic achievement. Student engagement, particularly the academic subtype, has been linked to achievement-related outcomes including grades, performance on standardized tests and tests of basic skills, and graduation from high school (Appleton et al., 2006). The relationship between engagement and school achievement makes inherent sense, given that students who complete class-related tasks, attend school regularly, value the learning and school process, and who feel like they belong at school are likely to perform better on tests and graded assignments than students who are not similarly engaged with school. Aligned with this is the idea that student engagement is one of the broad domains of academic enablers, which are "nonacademic skills, attitudes, and behaviors of students that contribute to academic success in the classroom" (DiPerna & Elliot, 2002, p. 294).

Regarding connections between student engagement and grade point average (GPA), Marks (2000) identified a predictive relationship in that previous school success, operationalized as students' GPA, exerted a significant positive influence on engagement (i.e., students' responses to four items rated on a five-point Likert scale that represent the academic dimension of student engagement; "How often to do you pay attention in this

class?") for elementary, middle, and high school students. This influence was the strongest for high school students. In a separate study conducted with college students, moderate statistically significant predictive relationships were found between GPA and 9 out of 11 indicators of student engagement (Carini, Kuh, & Klein, 2006). Student engagement was based on students' responses to 45 items (on 11 different subscales). The 11 subscales represented the following domains of student engagement: affective (e.g., "the extent the institution emphasized providing the support you needed to succeed academically"), behavioral (e.g., "number of hours per week participated in co-curricular activities [organizations, campus publications, student government, social fraternity or sorority, intercollegiate or intramural sport, etc.]"), academic (e.g., "frequency worked with other students on projects during class during the current school year"), and cognitive (e.g., "frequency worked harder than you thought you could to meet instructors' standards or expectations during the current school year"). However, these findings may not generalize to youth given the developmental differences between college students and K-12 students.

Psychological functioning. Traditional models of mental health posit that the absence of psychopathology (i.e., mental health problems such as anxiety, depression, and conduct disorders) alone is indicative of satisfactory mental health standing. However, more modern conceptualizations of mental health emphasize not only the absence of psychopathology, but also the presence of positive indicators of wellness (Greenspoon & Saklofske, 2001). Largely due to the positive psychology movement, a dual-factor model of mental health is garnering support for being able to classify individuals from troubled (low wellness and high psychopathology) to complete mental

health (no psychopathology in tandem with the presence of subjective-well being; Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008). Thus, it is important to examine both positive and negative indicators of mental health in students, and determine how these mental health indicators relate to academic indicators, including student engagement. Following is a review of the literature pertaining to student engagement and psychological functioning.

Psychopathology. Psychopathology is commonly divided into externalizing problems (e.g., conduct problems, substance use, oppositional behaviors) and internalizing problems (e.g., anxiety, depression, somatic concerns) as delineated by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (American Psychiatric Association, 2000). The few empirical examinations of student engagement in relation to various forms of psychopathology have provided support for a relationship between low levels of student engagement and increased symptoms of psychopathology. For instance, Schochet et al. (2006) collected two waves of data collected 1 year apart and found that middle school students' perceived school connectedness, a construct akin to affective engagement, was associated with more depressive and anxious symptoms in adolescents. Specifically, among a sample of over 2,500 Australian eighth grade students, student connectedness (assessed via student self-report on the PSSM at both Time 1 and Time 2) yielded strong, inverse correlations with symptoms of depression (r = -.63 at Time 1 and -.67 at Time 2), and moderate, inverse correlations with anxious symptoms (r = -.32 at Time 1 and -.34 at Time 2). Psychopathology was assessed by the Children's Depression Inventory (CDI; Kovacs, 1992) and the Spence Children's Anxiety Scale (SCAS; Spence, 1998). Additionally, low

affective engagement (i.e., not feeling connected to the school setting) predicted later depressive symptoms for both boys and girls, and later anxiety symptoms for girls. These findings indicate that the affective component of student engagement in particular is linked to internalizing problems in early adolescents in Australia. It is unknown if similar associations are apparent in high school age students, and which dimensions of engagement other than affective co-occur with internalizing forms of psychopathology.

Low levels of student engagement have also been found to be associated with externalizing problems. A major theme uncovered through a qualitative study that sought to provide a better understanding of the schooling experiences associated with juvenile delinquency was that the juvenile offenders felt discouraged at school due to learning challenges and became disengaged with school due to poor student-teacher relationships (Sander et al., 2010). This demonstrates a connection between perceived low levels of affective engagement, in terms of support from teachers, and delinquency. In a similar line of research, Hirschfield and Gasper (2011) assessed 3,580 youth ages 10 to 13 at two time points separated by a year. The data analyzed in this study were a part of data collected from over 11,000 inner-city Chicago school children who participated in Comer's School Development Program Evaluation. Low levels of behavioral engagement (defined as time spent engaged in academic work outside of class measured by the ratio of hours on a typical weekday spent on homework compared to hours spent engaged in six leisure activities, such as spending time with friends) during the first wave of data collection significantly predicted partaking in delinquent behaviors, such as vandalism, shoplifting, and fighting one year later. Taken together, these studies point to inverse relationships between the subtypes of student engagement and both internalizing and

externalizing forms of psychopathology. However, the studies examining the links between student engagement and psychopathology have been limited to examining only two components of engagement: affective and behavioral. Thus, more research is needed to understand how other subtypes of engagement, namely academic and cognitive, relate to various forms of psychopathology.

Psychological wellness. Traditionally, positive indicators of mental health have been overlooked and the focus has instead been on whether or not symptoms of psychopathology are present in individuals. However, ignoring the presence (or absence) of positive indicators precludes a complete understanding of mental health. Positive indicators of mental health commonly include subjective well-being, a scientific term for happiness, which is comprised of three constructs: positive affect, negative affect, and life satisfaction (Diener, 2000). Whereas affect refers to the frequency with which one experiences positive emotions relative to negative emotions in daily life, life satisfaction entails global cognitive evaluations of an individual's happiness with his or her life on the whole (Diener et al., 2002). Life satisfaction is a chief indicator of mental wellness (Cowen, 1994; Park, 2004). Complete mental health entails both low levels of psychopathology and high levels of happiness (Suldo & Shaffer, 2008). Psychologists who support a dual factor approach posit that it is essential to study youth's happiness concurrently with their levels of psychopathology (i.e., via negative indicators of mental health).

Few studies have directly inspected the possible association between students' happiness and engagement with school. The recently published exceptions have begun to illustrate the positive and significant relationship between these two constructs. Case in

point, a study with 293 students in grades 7 to 10 found significant positive correlations between positive affect (assessed via student self-report on the Positive and Negative Affect Scale for Children; PANAS-C; Laurent et al., 1999) and several subscales of the SEI (Reschly, Huebner, Appleton, & Antaramian, 2008). Specifically, greater positive affect co-occurred with higher levels of cognitive engagement (r = .37 on SEI Future Aspirations and Goals subscale; r = .46 on the Control and Relevance subscale) and affective engagement (r =.44 on Peer Support for Learning subscale; r = .46 on Teacher-Student Relationships subscale; r = .47 on Family Support for Learning subscale). Conversely, high scores on the negative affect scale of the PANAS-C co-occurred with lower cognitive (r = -.22 on Future Aspirations and Goals subscale; r = -.18 on Control and Relevance subscale) and affective (r = -.25 on Peer Support for Learning subscale; r = -.20 on Teacher-Student Relationship subscale; r = -.20 on Family Support for Learning subscale) engagement dimensions. In separate statistical analyses utilizing the same dataset as Reschly et al. (2008), Lewis et al. (2009) found that positive affect predicted (in regression analyses) both cognitive and affective engagement significantly more than did negative affect, indicating that happier students were more likely to be engaged whereas engagement was less tied to frequency of negative emotions. These results provide further support for the relevance of adolescents' happiness to their engagement at school.

The relationship between happiness and student engagement has also been studied longitudinally. With a sample of 779 students in the 7th and 8th grades, Lewis et al. (2011) found that, after controlling for baseline levels of engagement, higher global life satisfaction scores predicted higher levels of cognitive and affective engagement later in

the school year, but not behavioral engagement. Further, lower levels of life satisfaction predicted lower affective engagement. A bi-directional relationship emerged between cognitive engagement and life satisfaction, such that higher levels of cognitive engagement in the beginning of the school year predicted higher levels of life satisfaction at the end of the school year, and vice versa.

In sum, the research conducted on happiness and student engagement thus far supports a link between the two constructs. Students who are happier tend to become more engaged with school, and there is some evidence that the reverse may also be true. However, the links between happiness and student engagement have largely been examined in samples of middle school students, and researchers who have examined these links in high school students have only included 9th and 10th grade students. Thus, it is unknown if similar associations between happiness and student engagement are apparent in high school students, particularly those in the 11th and 12th grades. It is also unknown how the academic and behavioral dimensions of student engagement relate to student happiness.

One particular subgroup of high school students in need of attention involves the increasingly large number of students enrolled in college-level courses (College Board, 2012b; IBO, 2012d). The phenomena of engagement may be unique to the somewhat restricted range of variance. Specifically, by seeking out rigorous coursework and achieving at a high enough level to permit early entry to college-level courses, a relatively high level of engagement is assumed (although not fully empirically verified). Following is an overview of two popular rigorous high school academic curricula that provide high-achieving high school students with opportunities for college credit and/or

preparation for later college experiences, some unique features of high-achieving students, and a review of the existing literature on student engagement in various groups of high-achieving youth.

High-Achieving Students

Students can be considered high-achieving for numerous reasons. High-achieving in the current study refers to the type of student enrolled in rigorous college-level curricula while in high school. To gain access to these curricula, students must often meet entrance requirements (e.g., minimum scores on state proficiency tests, grade point averages, grades in pre-requisite courses), and maintain high grade point averages in their coursework (e.g., A and B averages). Two of the most popular high school curricula for high-achieving students include the International Baccalaureate (IB) diploma program and Advanced Placement (AP) courses (US DOE, 2009). The AP courses have been in American schools since the late 1950s and were designed with the purpose of better educating students preparing to enter college (College Board, 2003). There are 34 AP courses (i.e., college-level classes) offered across a wide-range of subject areas (College Board, 2012a). Generally, schools offer AP courses in a cafeteria-style manner, where students may pick and choose in which courses to enroll. Students take end-of-course exams and may be awarded college credit contingent on exam performance (College Board, 2012a). As of 2011, AP courses were offered in over 17,000 public and private high schools across the U.S. (College Board, 2012c). Both the amount of students leaving high school who have taken at least one AP exam and the amount who have passed at least one AP exam at any point in high school have nearly doubled from 2001 to 2011,

representing 28.3% and 16.9% of high school students nationwide, respectively (College Board, 2012b).

IB is an internationally offered program originally established in the 1960s in order to provide a comprehensive and standardized program of study emphasizing content depth across multiple subject areas to high school students as well as to foster international-mindedness and critical thinking (IBO, 2012a). The program is highly sequenced and requires students to complete service hours, oral exams, an extended essay, and end-of-course exams beyond their coursework in order to earn the IB diploma (IBO, 2012b). Students are able to earn college course credit as they progress through their IB coursework through also taking AP classes and, increasingly by earning a score of 4 or better on the end of course IB exam, as well as completing the IB diploma. However, college credit for IB coursework is given at the discretion of individual postsecondary institutions after students are accepted into the institution (Waits, Setzer, and Lewis, 2005). As of 2011, IB programs were offered in 755 schools across the U.S (IBO, 2012c). The number of IB diploma programs world-wide has increased by 85.09% from 2007 to 2012 (IBO, 2012d). There are extensive program completion requirements and high expectations for students in IB programs to meet. The argument can also be made that while both IB and AP are challenging academic curricula, IB requirements and expectations exceed those of AP courses. To date, no published studies have examined all four components of student engagement in either IB or AP students.

The increased challenges and expectations associated with AP-IB coursework may facilitate engagement through providing increased challenges well-matched to high-achieving students' skill levels, or, conversely, place some AP-IB students at-risk for

experiencing diminished engagement (e.g., burnout). Suldo, Shaunessy, and Hardesty's (2008) work with high school students in one such rigorous college preparatory program (i.e., IB) found that IB students report experiencing higher levels of stress than their general education classmates. Furthermore, students' elevated levels of perceived stress yielded moderate to large inverse correlations with students' perceptions of their academic abilities and life satisfaction, as well as large positive correlations with students' symptoms of internalizing and externalizing psychopathology (Suldo, et al., 2008). In a separate study comparing students in an IB program with their general education peers, Suldo et al. (2009) found that IB students perceived more stress related to academic requirements and struggles, and that these higher levels of stress inversely correlated with students' life satisfaction and positively correlated with students' psychopathology.

Given the aforementioned findings, it can be concluded that high school students in rigorous academic programming experience elevated levels of stress, and this stress puts some students at risk for experiencing a host of negative outcomes, such as lower life satisfaction and increased psychopathology. Furthermore, research has established that lower levels of happiness (e.g., life satisfaction) and increased symptoms of psychopathology tend to co-occur with lower levels of student engagement (Hirschfield & Gasper, 2011; Lewis et al., 2009; Lewis et al., 2011; Reschly et al., 2008; Sander et al., 2010; Schochet et al., 2006). So far, research has mostly been limited to studying high-achieving youth in only one type of college preparatory program: IB. Other samples of high-achieving students, such as students enrolled in college-level classes (e.g., AP classes, Dual-enrollment classes) and intellectually gifted students have largely been

overlooked. Thus, more research is needed to investigate (a) differences in mean levels of student engagement among students enrolled in various academic curricula, and (b) the relationships between engagement and students outcomes in important domains such as psychological functioning and academic achievement. These lines of research are justified by the notion that students in AP and/or IB may be at-risk for experiencing poorer outcomes due to the high academic demands and achievement expectations placed on them and their elevated levels of stress.

Student Engagement in High-Achieving Youth

Few empirical studies have been conducted that directly examine any dimension of student engagement within samples of high-achieving students. The exceptions are reviewed next, to provide a complete understanding of the literature pertinent to any dimension of student engagement in any sample of high-achieving high school students. Groups of high-achieving students include those with higher levels of innate cognitive abilities (i.e., students identified as gifted) and/or those students whose academic performance is high enough to permit entry into typically-selective AP classes and IB programs.

Intellectually gifted students. In a study examining differences in cognitive and affective engagement between groups of academically underachieving and high-achieving gifted high school students, McCoach and Siegle (2003a) administered the SAAS-R to a sample of 176 gifted high school students in grades 9 through 12. Gifted was defined as having an IQ or achievement score at or above the 92nd percentile. Students were defined as high-achievers if they were in the top 10% of their class and had at least a 3.75 GPA (n = 120), whereas underachievers were defined as students in the

bottom half of their class or having a 2.5 or lower GPA (n = 56). Results revealed significant mean differences between gifted high-achievers' and underachievers' affective engagement (i.e., positive attitudes toward teachers, positive attitudes toward school) and cognitive engagement (i.e., goal valuation [considering schooling as important to one's career and life goals], motivation/self-regulation [working hard and being internally motivated to complete schoolwork]), with high-achievers having higher mean scores on four SAAS-R subscales than underachievers. Moreover, the high-achievers exhibited moderate to large effect sizes (d = .67 to d = 1.29) on each of the four subscales. The largest mean differences were the on the subscales tapping cognitive engagement, specifically the Motivation/Self-Regulation and Goal Valuation subscales (d =1.29, d = 1.23, respectively). Thus, results from this study suggest that intellectual giftedness per se is not associated with higher levels of school engagement; rather, there are reliable differences in the affective and cognitive dimensions of engagement that co-vary with the students' achievement levels.

McCoach and Siegle (2003c) also found significant differences in cognitive engagement (i.e., the Academic Self-Perceptions scale of the SAAS-R) between gifted high school students and general education high school students. Specifically, gifted students rated their perceived academic abilities higher than the general education students. Given that this study examined gifted students in a homogenous manner without regard to achievement level, these results seem to stand contradictory to the results reported by McCoach and Siegle (2003a). Of note, the sample in the 2003a publication included only gifted students, whereas the 2003c study compared gifted and general education students. The primary finding from McCoach and Siegle (2003c) is that gifted

students may have uniquely high engagement levels compared to general education students. Taken together, these studies suggest that gifted students as a whole perceive more competence in regard to school (cognitive engagement) as compared to their general education counterparts, and that the affective and cognitive engagement of high-achieving gifted high school students is particularly high.

High school students in rigorous academic curricula. The levels of student engagement among high-achieving youth who take college-level courses while in high school have largely not been explored. In one exception, Shaunessy et al. (2006) examined affective and cognitive engagement in a total of 301 high school students. This sample included 122 students enrolled in the IB program at the high school, and 179 students in the school's general education program. Of the IB students, 33 were identified as intellectually gifted, and the remaining 89 were identified as high-achieving learners. Affective engagement (i.e., feeling connected to students, teachers, and the school at large) was assessed via the School Climate Scale (SCS; Haynes, Emmons, & Ben-Avie, 2001) and cognitive engagement was assessed via the six item self-efficacy scale (i.e., believing one is capable of managing their learning behaviors, mastering schoolwork, and meeting academic goals) of the Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001).

Results revealed significant mean differences between IB students' (gifted and high-achieving) and general education students' affective engagement and cognitive engagement, with IB students having higher mean scores on four of the six SCS scales and the SEQ academic self-efficacy scale. Additionally, significant mean differences were found between IB students and general education students in relation to academic

achievement, with IB students earning higher GPAs than their general education counterparts. Thus, results from this study suggest that students enrolled in one college-level curricula feel more connected to their schooling (i.e., have higher affective engagement), and are better able to regulate their own learning and meet academic goals (i.e., have higher cognitive engagement), and display higher academic achievement (as evidenced by GPA) than students in general education.

Through the administration of the HSSSE, Yazzie-Mintz (2010) also found that students enrolled in honors, college preparatory, and advanced courses (collapsed into a single category) had higher mean levels of engagement across the behavioral, cognitive, and affective dimensions than students in other academic tracks (i.e., career/vocational, English language learner/English as a second language/bilingual, general/regular education, special education). However, it is unclear what sorts of classes constituted college preparatory and advanced coursework in this study. Moreover, specific differences between students in advanced courses and other academic tracks were not reported, precluding a complete understanding of how student engagement operates among groups of students in different rigorous curricula. Much more research is needed to confirm that students in rigorous academic programming (e.g., IB programs, AP classes) have consistently high levels of engagement across the academic, behavioral, cognitive, and affective domains throughout the high school years. Also, research is needed to determine the associations between the various domains of student engagement, and students' academic and psychological outcomes (e.g., GPA, life satisfaction, psychopathology).

Summary of Literature

In sum, student engagement is a construct that has historically been studied in the fields of both psychology and education in relation to school dropout and achievement-related outcomes. Engagement has recently been operationalized as comprised of four domains: academic, behavioral, cognitive, and affective. The academic component encompasses indicators of a student's involvement in academic-related tasks (e.g., completing homework, earning credit hours). The behavioral dimension refers to active student behaviors within the school and classroom contexts (e.g., school attendance, participating in extra-curricular activities). The cognitive domain refers to beliefs and mental processes that facilitate feelings of connectedness to school and learning (e.g., value school as necessary for meeting future goals, regulation of learning). The affective component refers to feelings and attitudes toward school (e.g., feeling supported by classmates and peers, having a sense of belongingness).

There are differences in how student engagement is typically examined across developmental stages. In elementary school, for instance, the academic and behavioral components of engagement are more likely to be studied than the cognitive and affective dimensions. Levels of engagement are also more likely to be reported by individuals other than students themselves (e.g., teachers, trained observers). In middle school students, the academic and behavioral dimensions of engagement are also more likely to be studied than the cognitive and affective domains, but students tend to self-report their levels of engagement more than elementary school studies. In high school, the affective and cognitive components of engagement are receiving increased attention, and most studies have relied on student self-report. This trend is due in part to more sophisticated

instruments (e.g., SEI, SAAS-R) available to study the cognitive and affective subtypes of engagement. In general, the literature on student engagement across different developmental stages has revealed that levels of engagement tend to decrease as students progress through school, that higher levels of engagement are associated with better achievement across subject areas, and that students who perceive higher levels of social support (e.g., from peers, teachers, or parents) have higher levels of engagement.

Beyond studying student engagement at various developmental levels, researchers have examined student engagement in conjunction with outcomes such as academic achievement and psychological functioning. The literature has demonstrated that students who are more engaged with school and learning are more likely to experience academic success in terms of indicators such as GPA. Additionally, the affective and behavioral indicators of student engagement have inverse relationships with both internalizing and externalizing symptoms of psychopathology; more research is needed to examine how the cognitive and academic components of engagement relate to psychopathology. In regard to the link between student engagement and psychological wellness, the research conducted on happiness and student engagement thus far demonstrates that students who are happier tend to be more engaged with school, and there is also some evidence to support the reverse.

While the construct of student engagement has garnered more attention in recent years as particularly relevant to important student outcomes, little is known about engagement in the growing subgroup of high-achieving high school students who take college-level classes. Increased enrollment of high school students in rigorous academic programming such as IB and AP points to a clear need for such research. Past research

has made it clear that students in such programs experience elevated levels of stress, particularly related to their schooling-related requirements, struggles, and expectations. However, little is known about these students' levels of engagement across the domains (i.e., behavioral, affective, cognitive, academic) and the links between the various dimensions of engagement and outcomes such as achievement and psychological functioning. While preliminary work has suggested that high-achieving students exhibit higher levels of student engagement across the domains, between-group differences (e.g., students in AP vs. IB) in engagement are unknown.

Purpose of the Current Study

No published studies have empirically examined all four subtypes of student engagement (i.e., academic, behavioral, cognitive, affective) in high-achieving high school students. Furthermore, no research has examined how these components of engagement may vary across the high school years, or how they relate to important outcomes such as academic achievement and mental health in a sample of students enrolled in intensive academic programs. The need for such a study is enhanced due to the growing enrollment in such programs (College Board, 2012b; IBO, 2012d).

The purpose of this study was to provide preliminary answers to address these needs. The study aimed to bestow valuable information to key stakeholders such as school administrators, teachers, school psychologists, and guidance counselors about levels of the four main components of student engagement among students enrolled in AP courses and IB programs. Additionally, the current study empirically examined the relationship between student engagement and indicators of academic achievement and mental health. Since student engagement is considered a malleable factor, it can be

targeted for intervention among youth with identified low levels. In order to accomplish these objectives, the current study answered the following research questions:

1. Do mean differences exist between students enrolled in Advanced Placement (AP) courses and students enrolled in International Baccalaureate (IB) programs in the following indicators of student engagement:
    a. Academic
    b. Behavioral
    c. Cognitive
    d. Affective?
2. Do levels of student engagement (as defined above) differ significantly between high school students in 9^{th}, 10^{th}, 11^{th}, and 12^{th} grades, among:
    a. Students enrolled in AP courses?
    b. Students enrolled in IB programs?
3. To what extent does student engagement (as defined above) relate to academic achievement, as defined by unweighted grade point average (GPA)?
4. To what extent does student engagement (as defined above) relate to the following positive and negative indicators of mental health:
    a. Life satisfaction
    b. Anxiety?

CHAPTER III: Method

The current study explored the levels of the four main dimensions of student engagement (i.e., academic, behavioral, cognitive, affective) among high-achieving high school students enrolled in AP courses and IB programs. Furthermore, it examined how these dimensions of engagement relate to important student outcomes such as academic achievement and mental health. This cross-sectional study is quantitative in nature and analyzed data from a secondary source. The following chapter describes the data source for the study, the measures that were administered, procedures of data collection, and overviews the analyses conducted.

Participants

Data source. The current study conducted secondary analyses of an archival dataset. That dataset is part of a larger research project (consisting of a series of seven sequential studies) funded by the Institute of Education Sciences (IES) in a grant awarded to Drs. Suldo and Shaunessy. The purpose of the IES-funded study is to better understand the intense academic demands faced by students in college preparatory programs, and identify malleable student factors associated with educational outcomes. The specific dataset analyzed in the current study includes data collected from 727 AP and IB students during Study 6 (purpose: develop and validate self-report measures of AP and IB students' stressors and coping strategies) of the larger project. The author of this thesis was an active member of the research team that collected and entered these data in the

Spring of 2011. The Institutional Review Board (IRB) for human subject research at the University of South Florida (USF) approved study procedures and personnel.

Sample. The descriptive statistics of the student participants in Study 6 are summarized in Table 1. All participants were high school students enrolled in either an IB program or an AP course(s) in the Spring of 2011. A total of 727 students (21.6% 9th grade; 25.8% 10th grade; 26.3% 11th grade; 26.3% 12th grade) comprised the sample. Participants attended six high schools (3 with IB programs, 3 with AP courses) within three school districts in one southeastern state. Females were slightly over-represented in the sample (63.1%) compared to males, and 17.8% of participants were considered lower SES based on self-report of receiving school lunch for a free or reduced price. In terms of ethnicity, the sample is diverse (67% Caucasian; 14% Hispanic; 3.5% African American; 14.5% Asian; 8.5% multi-ethnic; 6.5% other ethnicity). Of the 727 students in the sample, 313 were enrolled in IB programs and 414 were enrolled in AP classes.

Student Self-Report Measures

Demographics form. The demographics form (see Appendix A) contained questions concerning students' gender, age, grade, race, ethnicity, and SES. SES was assessed based on free or reduced-price lunch status, as well as parents' educational levels. Also included on the demographics form was a question that asked students to self-report the number of AP classes they had taken so far in their high school careers. The number of AP classes taken by students served as an indicator of academic engagement in the current study.

School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003a). The SAAS-R is a 35-item self-report measure of students' attitudes toward and

beliefs about school (see Appendix B). Respondents are asked to indicate on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*) the degree to which they endorse various statements related to their school experience (e.g., "I am glad I go to this school," "I can grasp complex concepts in school"). Higher scores represent more positive attitudes and beliefs in regard to school. Five subscales are included on the SAAS-R: Attitudes Toward Teachers (7 items), Attitudes Toward School (5 items), Goals (6 items), Academic Self-Perception (7 items), and Motivation/Self-Regulation (10 items). The first two subscales are indicators of affective engagement and the latter three subscales are indicators of cognitive engagement.

The Attitudes Toward Teachers scale assesses students' attitudes and feelings toward their teachers (e.g., "My teachers care about me"). One of the components of affective engagement is the degree to which students feel supported by their teachers; thus, the Attitudes Toward Teachers Scale can be used as an indicator of affective engagement. The Attitudes Toward School scale assesses students' attitudes and feelings toward their school in general (e.g., "I like this school). Another component of affective engagement is the degree to which students feel connected to their school; thus, the Attitudes Toward School scale can be used as another indicator of affective engagement.

The Goals scale assesses the degree to which students believe that succeeding in school should be a goal, as well as the degree to which they believe succeeding in school is important to accomplishing future goals (e.g., "Doing well in school is one of my goals"). The Academic Self-Perception scale assesses students' perceived competency in school (e.g., "I am good at learning new things in school). The Motivation/Self-Regulation scale assesses students' ability to regulate behaviors that enable them to

succeed in school, as well as their motivation to complete schoolwork (e.g., "I use a variety of strategies to learn new material," and "I am self-motivated to do my schoolwork"). The cognitive domain of engagement encompasses the three above constructs. As such, the Goals, Academic Self-Perception, and Motivation/Self-Regulation scales can all be used as indicators of cognitive engagement.

In previous published research with high school students, all subscales on the SAAS-R evidenced strong internal consistency (coefficient alphas ranging from .89 to .91; McCoach & Siegle, 2003a). Criterion-related validity is supported by studies demonstrating that SAAS-R scores differentiate groups of students with different achievement levels, specifically high-achieving versus under-achieving gifted students (McCoach & Siegle, 2003a) and low achieving, average achieving, and high achieving general education and IB students (analyzed as a single group; Suldo et al., 2008).

Evidence of convergent validity has been demonstrated through high correlations between scales of the SAAS-R with other indicators of academic functioning, as reported by Suldo et al. (2008). Specifically, the Academic Self Perception scale correlated highly with academic self-efficacy ($r = .64$), as assessed by the Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001). The Attitudes Toward Teachers scale correlated highly with the student-teacher relations scale ($r = .74$) of the School Climate Survey- High School Student Version, Revised (SCS; Haynes et al., 2001), and the Attitudes Towards School scale correlated highly with the School Satisfaction subscale ($r = .54$) of the Multidimensional Students' Life Satisfaction Scale (MSLSS; Huebner, 1994). Additionally, both the Motivation/Self-Regulation and Goals scales correlated with academic self-efficacy ($r = .68$, $r = .45$, respectively).

Students' Life Satisfaction Scale (SLSS; Huebner, 1991). The SLSS is a 7-item self-report measure of global life satisfaction (see Appendix C). Respondents are asked to indicate on a 6-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*) the degree to which they endorse statements pertaining to their life (e.g., "I have a good life," and "I would like to change many things in my life"). Higher scores indicate greater levels of life satisfaction.

Huebner (1991) reported the SLSS to have high internal consistency (coefficient alpha = .82) and moderate to high correlations with other measures of happiness. Specifically, SLSS scores correlated significantly with the Happiness subscale of the Piers-Harris (Piers, 1984), Andrews and Withey's (1976) measure of life satisfaction, and Bradburn's (1976) measure of subjective well-being, with correlations ranging from .36 to .62 (Huebner, 1991). In previous published research with high school students, the SLSS evidenced strong internal consistency, with coefficient alphas ranging from .82 to .86 (Gilman & Huebner, 1997; Suldo & Huebner, 2006).

Multidimensional Anxiety Scale for Children-10 (MASC-10; March, 1997). The MASC-10 is a 10-item self-report measure designed to measure various symptoms of anxiety in youth. The MASC-10 is not included as an Appendix due to copyright restrictions. Respondents are asked to indicate on a 4-point Likert scale (0 = *never true about me* to 3 = *often true about me*) the degree to which they endorse statements corresponding to the four basic anxiety dimensions that the MASC assesses: physical symptoms, harm avoidance, social anxiety, and separation/panic.

In the technical manual, March (1997) reported satisfactory internal reliability coefficients for the MASC-10 total score, ranging from .64 to .69 for females and from

.65 to .71 for males in the standardization sample comprised of 8-19-year olds. The MASC-10 was derived from the full-length version of the MASC, a 39-item measure of anxiety symptoms. According to the MASC manual (March, 1997), the 10 items contained on the MASC-10 were selected following factor-analytic procedures; the 10 items with the highest loadings on the four basic anxiety dimensions (i.e., physical symptoms, harm avoidance, social anxiety, separation/panic) were retained. The correlation between MASC-10 and the Total Anxiety score on the 39-item MASC is .90 (March, 1997).

Evidence of convergent validity has been demonstrated through correlations between the MASC-10 and other youth anxiety instruments. The MASC-10 correlated highly with the total scores on the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), with a correlation of .58, and with the children's form of the State-Trait Anxiety Inventory (STAIC; Spielberg, 1973), with a correlation of .60 (Rynn et al., 2006).

Data from Participants' School Records

Grades earned in classes. Students' academic achievement was indexed by their cumulative unweighted GPA at the time of data collection (i.e., end of 2010 – 2011 school year). Unweighted GPA values were provided to the research team by school employees who had access to students' school records. GPA data were examined as an outcome variable in the current study.

Attendance. School attendance was operationalized as the total number of days missed during the school year data was collected. Attendance data served as the indicator of behavioral engagement with school.

Table 1

Demographic Characteristics as a Percentage of the Sample

Characteristic	Total (N = 727) %	AP (n = 414) %	IB (n = 313) %
Gender			
Male	37	36	38
Female	63	64	62
Grade Level			
9th	22	19	25
10th	26	26	26
11th	26	30	22
12th	26	26	27
Free or Reduced-Price Lunch			
No	82	78	87
Yes	18	22	13
Ethnicity			
Hispanic, Latino, or other Spanish origin	14	16	12
Not Hispanic	86	84	88
Race			
White	67	78	56
African-American	3.5	2	5
Asian	14.5	5	24
Multi-Ethnic	8.5	9	8
Other Ethnicity	6.5	6	7

Note. AP = Advanced Placement; IB = International Baccalaureate

Procedures

Recruitment of participants. After the USF IRB approved the study and permission was granted from each of the three participating school districts, parent consent forms (see Appendix D) were distributed to two classes of approximately 25 students per grade level at each of the six participating schools, for a total of eight classes per school. The research team anticipated participation from approximately 100 students per school (recruited from approximately 200 students per school), but all students who returned parent consent forms were allowed to participate in the study (even if this

number exceeded 100 students at the school). The approximate participation rate across schools ranged from 42.5% to 89%, with an average of 60.58% total. The three school districts' research policies permitted the research team to offer varying levels of incentives to increase student participation. The specific incentives provided in each school district are summarized in Table 2. Each of the school districts had participation rates above 50% (52.5% in District C; 61.25% in District A; 68.25% in District B), suggesting that the limiting of direct incentives in individual school districts did not detrimentally impact student participation rates.

Table 2

Incentives Distributed to Schools within each District

Recipient	District A	District B	District C
School- General Fund	$500 donation to the school	$500 donation to the school	$500 donation to the school
School Coordinator	$500 donation to the school	$500 donation to the school	$500 to the school administrator
Teacher Recruiter(s)	$800 donation to the school	$800 donation to the school	$100 to the teacher, for each class of 25 students recruited
Student Participant			
Incentive 1 (after completion of self-report survey)	$7.50 donation to school per student who completed survey	Pre-paid movie pass to the student	Pre-paid movie pass to the student
Incentive 2 (after return of consent form)	--	$50 Visa gift card (1 student per class)	$50 Visa gift card (1 student per class)

Collection of student self-report data. A list of students who obtained parental consent for participation in the study was compiled by the USF research team and provided to each school. In groups of 10 to 100, students on a school's list reported to

large, private spaces within the school (e.g., media center, cafeteria) during school hours. Data collection dates occurred between February and May of 2011 across the six schools. In order to participate in the study, all students with written parent consent to participate had to also provide written assent (see Appendix E). A member of the research team read aloud the student assent form to all students prior to their completion of the survey packet. Students were informed that they could withdraw from the study at any time without risk of penalty. Students who provided assent were first asked to complete the demographics form while a member of the research team read the items aloud. Next, a member of the research team provided direct instruction on how to complete Likert-style survey items by walking through example items of stress and coping. Participants then independently completed the remainder of the survey packet. The measures in the survey packets were counterbalanced (four separate versions of the packet were administered) to control for order effects. At least one member of the research team remained available to answer questions and monitor students' completion of the survey packet throughout the administration of the questionnaires. Upon each student's completion of the surveys, a member of the research team visually scanned through the packet to check for skipped items or response errors, and students were asked to complete or correct items as needed. Students took approximately 45-60 minutes to complete the survey packet.

Collection of data from school records. A school employee (i.e., assistant principal or lead guidance counselor designated to serve as the "school coordinator" with regard to coordinating the school's involvement in the study) from each of the six schools provided the Primary Investigator (PI) of the larger study with the GPA and attendance records for each student participant.

Ethical Considerations

Precautions were taken in order to safeguard the participants' rights. USF's IRB, as well as the IRB's of all three school districts that had schools participate in the study, approved the larger study from which the Study 6 data was drawn. Second, students obtained written parent consent prior to participating in the study. These consent forms informed parents and students of the purpose of the study, potential risks and benefits of participating, and provided contact information for the principal investigators in the case of any questions concerning the study. Third, students were required to give their written assent to participate in the study on the day of data collection. Students were read the assent form aloud by a member of the research team, permitted time to pose questions, and given a second copy of the assent form to keep in case they had questions after data collection was complete. Fourth, students did not write any identifying information anywhere on the survey packet. Rather, each student was assigned a code number, which ensured the confidentiality of student data. Only approved members of the research team have access to documents linking participants' names and code numbers.

Overview of Analyses

Means, standard deviations, and additional descriptive data (e.g., skew, kurtosis) were calculated for the entire sample, as well as for the two subsamples of students (i.e., IB students, AP students), for all variables of interest including: academic engagement (number of AP courses taken), behavioral engagement (attendance), cognitive engagement (Academic Self-Perception, Goals, and Motivation/Self-Regulation subscales of the SAAS-R), affective engagement (Attitude Toward Teacher and Attitude Toward School subscales of the SAAS-R), mental wellness (SLSS), psychopathology

(MASC-10), and academic achievement (unweighted GPA). A correlation matrix was constructed that contains the bivariate relationships between all continuous predictor and outcome variables.

Following preliminary analyses, a series of statistical analyses were conducted to answer the four research questions posed in this study.

1. *Do mean differences exist between students enrolled in Advanced Placement (AP) courses and students enrolled in International Baccalaureate (IB) programs in the following indicators of student engagement:*
    a. *Academic*
    b. *Behavioral*
    c. *Cognitive*
    d. *Affective?*
2. *Do levels of student engagement (as defined above) differ significantly between high school students in 9th, 10th, 11th, and 12th grades, among:*
    a. *Students enrolled in AP courses?*
    b. *Students enrolled in IB programs?*

Group differences. To determine if students in the two types of academic programs displayed between-group differences in dimensions of student engagement as well as differences in dimensions of student engagement at different grade levels, seven separate two (program type) x four (grade level) ANOVAs were conducted. Tukey's HSD tests were used to determine where difference emerged between students. An alpha level of .05 was used to determine statistical significance.

3. *To what extent does student engagement (as defined above) relate to academic achievement, as defined by unweighted grade point average (GPA) for each curriculum group (i.e., AP, IB)?*
4. *To what extent does student engagement (as defined above) relate to the following indicators of mental health for each curriculum group (i.e., AP, IB):*
    a. *Life satisfaction*
    b. *Anxiety?*

Regression analyses. To determine which dimensions of student engagement are most predictive of academic achievement (as measured by unweighted GPA), mental wellness (as measured by the SLSS), and psychopathology (as measured by the MASC-10), three simultaneous multiple regression equations were conducted (one for each outcome). A simultaneous multiple regression analysis allowed for the examination of how each dimension of student engagement influences each of the outcome variables while controlling for the influence of all other dimensions of engagement. A sample equation is below.

Mean SLSS = program type + grade level + academic engagement (sum total number of AP/IB classes taken divided by grade level) + behavioral engagement (attendance) + cognitive engagement (mean score on the SAAS-R Motivation/Self-Regulation, Academic Self-Perceptions, and Goals subscales) + affective engagement (mean score on the SAAS-R Attitudes Toward Teachers and Attitudes Toward School subscales)

Review of results from a multiple regression determined the proportion of the variance of each of the outcome variables (i.e., GPA, life satisfaction, anxiety) that can be

accounted by each of the dimensions of student engagement independently. Beta weight and uniqueness indices were examined to determine the strength of each predictor variable. An alpha level of .05 was used to determine statistical significance.

CHAPTER IV: Results

This chapter includes the results of the statistical analyses conducted to answer the four research questions in the current study. First, steps taken to screen the data and conduct preliminary analyses are described. Then, the results of a series of two (program type) x four (grade level) ANOVAs are presented to illustrate the differences in the four dimensions of student engagement (i.e., academic, behavioral, affective, cognitive) among students in the two programs of study (i.e., IB, AP) by grade level. Next, the results of three simultaneous multiple regression conducted to determine the portion of variance in the three outcome variables of interest (i.e., academic achievement, life satisfaction, anxiety) predicted by all four dimensions of student engagement, as well as each student engagement dimension individually, are presented.

Data Screening

Data entry. Raw student self-report data were entered into a software program, Remark, through scanners by members of the research team who were involved in data collection for the larger study. The dataset was then imported into SPSS, checked for data entry errors, and screened for any systematic errors in participants' responding. To ensure accurate data entry, integrity checks were initially completed for 10% of participants' survey packets. When an error was found in one or more item in a given participant's packet of completed surveys, the error(s) was corrected in the database and the survey packets entered before and after the packet that contained the error were verified for accuracy. This process was repeated until error-free packets were discovered. Most of the

detected (and subsequently corrected) data entry errors occurred as a result of a scanning mis-read on one particular measure in the survey packet. Overall, trustworthiness of the data entry procedure was very high, and the resulting dataset analyzed in the current study is reflective of students' self-report responses.

Missing data. Rates of missing data points were very low, largely due to data collection procedures in which research assistants visually scanned completed survey packets for chunks of skipped items (e.g., pages skipped) and directed participants' attention to the missing items. When missing data were accidental, participants completed the item(s) on the spot. When there were missing data on scales (i.e., SLSS, MASC-10, SAAS-R) analyzed in the current study, overall scale scores were calculated and participants' scale scores were retained in the analysis as long as the students completed a certain cutoff number of items on that scale. For the SLSS, students had to answer at least five of seven items. For the MASC-10, students had to answer at least seven of 10 items. For the SAAS-R scales, students had to answer at least five of seven items on the Attitude Toward Teachers and the Academic Self-Perception scales, at least four of five items on the Attitude Toward School scale, at least five of six items on the Goals scale, and at least seven of 10 items on the Motivation Self-Regulation scale.

Variable Creation

To permit analyses between constructs (vs. individual items), summary scores were created to index participants' levels of life satisfaction, anxiety, motivation and self-regulation of learning (cognitive engagement), academic self-perceptions (cognitive engagement), goals associated with schooling (cognitive engagement), attitude toward teachers (affective engagement), attitude toward school (affective engagement), and AP

course participation (academic engagement). The remaining two variables did not require creation of composite scores, as behavioral engagement and academic achievement corresponded to single-item indicators provided from school records.

Participants' global life satisfaction score was calculated as the mean of participants' responses to the seven items on the SLSS (after items 3 and 4 were reverse-scored). A total anxiety score was created by calculating the mean of the participants' responses to the 10 items on the MASC-10. Mean scores for motivation and self-regulation of learning (MSR), academic self-perception (ASP), goals of schooling (GLS), attitude toward teachers (ATT), and attitude toward school (ATS) were created by calculating the mean of the participants' responses to the 10, 7, 6, 7, and 5 items on the five SAAS-R subscales that correspond to the constructs mentioned above, respectively. The decision to focus on each of the subscales of the SAAS-R as individual indicators of cognitive and affective engagement rather than to combine the subscales into composites of cognitive and affective engagement was made after considering the fact that subscales appear to represent unique indicators of their respective dimensions of engagement, and thus important information may be lost if the subscales were combined.

For academic engagement, participants' total number of AP classes taken during high school (i.e., total number of AP classes completed in previous years added to the number of AP classes currently enrolled in at the time of data collection) was standardized by dividing this total score by the number of years they had been in high school (e.g., divided by 1 for 9^{th} grade students, divided by 4 for 12^{th} grade students). Behavioral engagement scores corresponded to the total number of days participants were absent during the school year in which student self-report data were collected. Academic

achievement scores corresponded to their cumulative unweighted grade point average, accessed at the end of the year in which data were collected.

Preliminary Analyses

Preliminary analyses consisted of: (a) computing Cronbach's alphas for the all multi-item scales, (b) computing descriptive statistics (e.g., means, standard deviations, skewness, kurtosis) for all variables of interest, and (c) examining correlations between key variables.

Measure reliability. The internal consistency was examined for all multi-item scales (i.e., SLSS, MASC-10, SAAS-R subscales: MSR, ASP, GLS, ATT, ATS). The coefficient alpha for the 7-item SLSS was .88. For the 10-item MASC-10, the internal consistency was .76. The coefficient alpha for the 10-item MSR was .90. For the 7-item ASP, internal consistency was .88. The internal consistency for the 6-item GLS was.89. The coefficient alpha for the 7-item ATT was .88. Internal consistency for the 5-item ATS was .93. In sum, the internal consistency (reliability) for each of the scales analyzed in this study was good to excellent.

Descriptive analyses. To assess normality issues, skewness and kurtosis of the variables of interest (predictors and outcomes) were calculated for the entire sample, as well as for each program type (i.e., AP, IB). Tables 3, 4, and 5 present these results. Most of the variables have an approximate normal distribution (skew and kurtosis between -2.0 and +2.0). However, academic engagement, behavioral engagement, the SAAS-R GLS scale have a non-normal distribution (kurtosis >3.00) for the entire sample and for the two subsamples of students. Thus, caution should be taken when interpreting the results

of analyses that include academic engagement, behavioral engagement, and the GLS scale.

Correlational analyses. To determine the bivariate relationships between all continuous predictor and outcome variables, correlation matrices were constructed for the entire sample (see Table 6) as well as for the subsamples of students within each curriculum group (see Table 7 for AP and Table 8 for IB). An alpha level of .05 was used to determine statistical significance. There were a few particularly large significant positive correlations among the indicators of cognitive (i.e., MSR scale, ASP scale, GLS scale) and affective engagement (i.e., ATT scale, ATS scale), respectively. For cognitive engagement, correlations among indicators ranged from .31 to .60, and for affective engagement, the correlation between indicators was .52.

Although the pattern of bivariate associations was largely similar across students from different program groups, there were some differences in terms of strength of correlations between the AP and IB samples that should be noted. For example, there was a significant positive correlation between academic engagement and academic achievement for AP students (r = .22), such that as students enrolled in and completed more AP courses, they earned better grades. For IB students this trend was not significant (r = .12). There was a significant positive relationship between Attitude Toward Teachers and academic achievement for AP students (r = .14), such that students with more positive attitudes toward school had higher academic achievement. This trend was not statistically significant within the IB sample (r = .11). There was a significant positive relationship between Attitude Toward School and academic achievement for IB students (r = .16), such that students with better attitudes toward school earned better grades. For

AP students this same trend was not significant (r = .08). There was a significant negative correlation between behavioral and academic engagement among AP students (r = -.10), such that the more school attended, the more AP courses students enrolled in and completed. For IB students this relationship was not significant (r = -.03). There was a significant negative correlation between Academic Self Perception and behavioral engagement (r = -.13) for AP students, such that the better attendance students had, the more confidence they had in their academic abilities. For IB students this relationship was not significant (r = -.05). In perhaps the largest difference between the two samples, there was a significant and moderate negative correlation for IB students between Goals and behavioral engagement (r = -.27), such that the better attendance students had, the more goals they had related to their academic pursuits. In contrast, AP students did not demonstrate a relationship between these two variables (r = -.03). There was a significant negative correlation between Attitude Toward School and behavioral engagement for IB students (r = .12), such that the better attendance students had, the more positive their attitude toward school. These variables were not related within the AP students (r = -.03).

Analysis of Group Differences

Seven separate two (program type) x four (grade level) ANOVAs examined the various indicators of student engagement between students in the two academic programs of interest (i.e., IB and AP) and by students' grade level. Table 16 below summarizes the results of the ANOVA analyses.

Academic engagement. Results indicated a significant interaction between program type and grade level, $F(3, 636) = 22.43$, $p < .0001$ (see Table 9). AP students were more academically engaged than IB students in 9th and 12th grade, whereas IB

students were more academically engaged than AP students in 11th grade, with similar levels of academic engagement in 10th grade.

Table 3

Means, Standard Deviations, Ranges, Skew, and Kurtosis of Variables for Entire Sample

Variable	*N*	Minimum	Maximum	*M*	(*SD*)	Skew	Kurtosis
Life Satisfaction	727	1.00	6.00	4.33	(0.93)	-0.55	0.15
Anxiety	727	1.00	3.90	2.15	(0.54)	0.23	-0.39
Academic Achievement	720	1.33	4.00	3.52	(0.43)	-1.00	1.09
Academic Engage	644	0.00	6.00	1.23	(0.76)	1.37	3.84
Behavioral Engage	723	0.00	31.00	4.80	(4.93)	1.89	4.80
Cognitive Engage							
Motivation/Self-Regulation	727	1.00	7.00	5.26	(1.07)	-0.78	0.54
Academic Self-Perception	727	2.00	7.00	5.51	(0.94)	-0.81	0.79
Goals	727	2.50	7.00	6.52	(0.69)	-1.98	4.76
Affective Engage							
Attitude Toward Teachers	727	1.14	7.00	4.86	(1.09)	-0.68	0.28
ATS	727	1.00	7.00	4.81	(1.52)	-0.68	-0.18

Note. Engage = engagement. Behavioral engage = attendance, with larger numbers indicating more absences. ATS = Attitude Toward School. Possible scores for cognitive and affective engagement variables range from 1 to 7.

Table 4

Means, Standard Deviations, Ranges, Skew, and Kurtosis of Variables for AP Students

Variable	*N*	Minimum	Maximum	*M*	(*SD*)	Skew	Kurtosis
Life Satisfaction	415	1.00	6.00	4.36	(0.92)	-0.70	0.64
Anxiety	415	1.00	3.90	2.11	(0.57)	0.34	-0.41
Academic Achievement	413	1.33	4.00	3.49	(0.46)	-1.07	1.31
Academic Engagement	408	0.25	4.50	1.28	(0.72)	1.31	2.40
Behavioral Engagement	415	0.00	31.00	5.64	(5.4)	1.78	4.06
Cognitive Engagement							
Motivation/Self-Regulation	415	1.40	7.00	5.22	(1.08)	-0.80	0.53
Academic Self-Perception	415	2.14	7.00	5.63	(0.91)	-0.74	0.50
Goals	415	2.50	7.00	6.52	(0.70)	-2.10	5.67
Affective Engagement							
Attitude Toward Teachers	415	1.14	7.00	4.85	(1.15)	-0.72	0.17
ATS	415	1.00	7.00	4.53	(1.57)	-0.52	-0.45

Note. Behavioral engagement = attendance, with larger numbers indicating more absences. ATS = Attitude Toward School. Possible scores for cognitive and affective engagement variables range from 1 to 7.

Caution should be taken when interpreting the results of this analysis, as the academic engagement variable was limited to students' self-report of the total number of AP courses they had taken by the time of data collection.

Table 5

Means, Standard Deviations, Ranges, Skew, and Kurtosis of Variables for IB Students

Variable	*N*	Minimum	Maximum	*M*	(*SD*)	Skew	Kurtosis
Life Satisfaction	312	1.29	6.00	4.28	(0.94)	-0.37	-0.39
Anxiety	312	1.00	3.70	2.20	(0.51)	0.11	-0.28
Academic Achievement	307	2.38	4.00	3.55	(0.38)	-0.72	-0.28
Academic Engagement	236	0.00	6.00	1.14	(0.81)	1.54	5.65
Behavioral Engagement	308	0.00	25.00	3.68	(3.95)	1.80	4.12
Cognitive Engagement							
Motivation/Self-Regulation	312	1.00	7.00	5.31	(1.05)	-0.76	0.56
Academic Self-Perceptions	312	2.00	7.00	5.35	(0.96)	-0.90	1.01
Goals	312	3.33	7.00	6.51	(0.68)	-1.82	3.48
Affective Engagement							
Attitude Towards Teachers	312	1.29	7.00	4.87	(1.00)	-0.58	0.35
ATS	312	1.00	7.00	5.17	(1.3)	-0.87	0.39

Note. Behavioral engagement = attendance, with larger numbers indicating more absences. ATS = Attitude Toward School. Possible scores for cognitive and affective engagement variables range from 1 to 7.

A total of 83 students either did not report the number of AP classes they had taken or indicated that they had not taken any AP classes at the time of data collection, with 76

being IB students. Thus, IB students are underrepresented in this analysis, as roughly one-quarter of this subgroup did not provide a response to the relevant survey items.

Behavioral engagement. The interaction between grade level and academic program was not significant, $F(3, 715) = 2.24, p > .05$ (see Table 10). Results indicated significant main effects for both grade level, $F(3, 715) = 5.42, p < .01$ and program type, $F(3, 715) = 25.35, p < .0001$. Mean scores by grade level and program type are presented in Table 10. Tukey's HSD test indicated that 9th grade students missed significantly less school than 11th and 12th grade students, and 10th grade students missed significantly less school than 11th grade students as well ($p < .05$). Concerning program type, IB students had higher levels of behavioral engagement (i.e., missed less school) than AP students ($p < .05$).

Cognitive engagement. Three separate two-way between-groups ANOVAs were conducted for the three indicators of engagement: Academic Self-Perception, Motivation/Self-Regulation, and Goal Valuation. For Academic Self-Perception, the analysis revealed a significant main effect for program type, $F(3, 719) = 15.04, p < .001$ (see Table 11). Tukey's HSD test indicated that AP students were significantly more confident in their academic skills than IB students ($p < .05$). The main effect for grade level was not statistically significant, $F(3, 719) = .43, p > .05$. The interaction between grade level and program type also was non-significant, $F(3, 719) = 2.54, p > .05$, indicating that the greater academic self-perceptions of the AP students was present across grade levels.

For Motivation/Self-Regulation, the analysis revealed a significant interaction between grade level and program type, $F(3, 719) = 3.30, p < .05$ (see Table 12). In 9th and

Table 6

Correlation Matrices for Variables within the Entire Sample (N = 727)

						Cognitive Engagement			Affective Engagement	
	Life Sat	Anxiety	Academ Achieve	Academ Engage	Behavior Engage	MSR	ASP	GLS	ATT	ATS
Life Sat	1.00									
Anxiety	-.25*	1.00								
Academic Achieve	.15*	.10*	1.00							
Academic Engage	.04	-.02	.18*	1.00						
Behavioral Engage	-.04	-.01	-.25*	-.06	1.00					
MSR	.27*	.08*	.30*	-.01	-.17*	1.00				
ASP	.33*	-.18*	.29*	.14*	-.07	.31*	1.00			
GLS	.18*	.09*	.25*	.01	-.11*	.60*	.28*	1.00		
ATT	.28*	.07	.13*	-.03	-.03	.39*	.33*	.34*	1.00	
ATS	.24*	.03	.12*	-.10*	-.10*	.23*	.19*	.23*	.52*	1.00

Note. Sat = Satisfaction, Engage = Engagement, Academ = Academic, MSR = Motivation/Self-Regulation, ASP = Academic Self Perception, GLS = Goals, ATT = Attitude Toward Teachers, ATS = Attitude Toward School. Behavioral engage = attendance, with larger numbers indicating more absences. *$p < .05$.

Table 7

Correlation Matrices for Variables within AP Students (n = 415)

						Cognitive Engagement			Affective Engagement	
	Life Sat	Anxiety	Academ Achieve	Academi Engage	Behavior Engage	MSR	ASP	GLS	ATT	ATS
Life Sat	1.00									
Anxiety	-.24*	1.00								
Academic Achieve	.13*	.11*	1.00							
Academic Engage	-.01	.03	.22*	1.00						
Behavioral Engage	-.05	.00	-.27*	-.10*	1.00					
MSR	.23*	.08	.27*	-.09	-.12*	1.00				
ASP	.29*	-.12*	.24*	.11*	-.13*	.32*	1.00			
GLS	.15*	.08	.25*	-.02	-.03	.60*	.32*	1.00		
ATT	.27*	.09	.14*	-.07	-.02	.43*	.36*	.37*	1.00	
ATS	.25*	.01	.08	-.08	-.03	.20*	.21*	.19*	.59*	1.00

Note. Sat = Satisfaction, Engage = Engagement, Academi = Academic, MSR = Motivation/Self-Regulation, ASP = Academic Self Perception, GLS = Goals, ATT = Attitude Toward Teachers, ATS = Attitude Toward School. Behavioral engage = attendance, with larger numbers indicating more absences. *$p < .05$.

Table 8

Correlation Matrices for Variables within the IB Students (n = 312)

						Cognitive Engagement			Affective Engagement	
	Life Sat	Anxiety	Academ Achieve	Academ Engage	Behavior Engage	MSR	ASP	GLS	ATT	ATS
Life Sat	1.00									
Anxiety	-.28*	1.00								
Academic Achieve	.19*	.06	1.00							
Academic Engage	.12	-.09	.12	1.00						
Behavioral Engage	-.07	.01	-.17*	-.03	1.00					
MSR	.34*	.07	.35*	.12	-.25*	1.00				
ASP	.38*	-.25*	.40*	.16*	-.05	.31*	1.00			
GLS	.22*	.10	.27*	.04	-.27*	.61*	.23*	1.00		
ATT	.29*	.04	.11	.04	-.06	.33*	.31*	.28*	1.00	
ATS	.27*	.01	.16*	-.11	-.12*	.25*	.25*	.30*	.43*	1.00

Note. Sat = Satisfaction, Engage = Engagement, Academ = Academic, MSR = Motivation/Self-Regulation, ASP = Academic Self Perception, GLS = Goals, ATT = Attitude Toward Teachers, ATS = Attitude Toward School. Behavioral engage = attendance, with larger numbers indicating more absences. *$p < .05$.

12th grade, AP and IB students reported similar levels of motivation and self-regulation of their academic-related behaviors. However, in 10th grade, AP students reported higher levels of motivation and self-regulation of their academic-related behaviors than IB students. The reverse is true for 11th grade students, where IB students reported higher levels of motivation and self-regulation of their academic-related behavior than AP students.

For Goal Valuation, the analysis revealed a significant main effect for grade level $F(3, 719) = 3.75, p < .05$ (see Table 13). Tukey's HSD test indicated that 10th and 11th grade students reported significantly more school-related goals than students in 12th grade. The main effect for program type was not significant, $F(3, 719) = .01, p > .05$. The interaction between type of program and grade level was also not significant $F(3, 719) = .93, p > .05$.

Table 9

Mean Levels of Academic Engagement by Program Type and Grade Level (n = 644)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	1.19	.39	75	.33	.66	30	.94	.62	105	1.13
10	.94	.45	106	.93	.86	67	.94	.64	173	.01
11	1.13	.61	123	1.52	.63	65	1.27	.64	188	-.51
12	1.85	.91	104	1.32	.69	74	1.63	.86	178	.68
Combined	1.28	.72	408	1.14	.81	236	1.23	.76	644	.18

In sum, findings across indicators of cognitive engagement included differences in levels of engagement among students in the two different academic programs in

general, differences in levels of engagement among students at different grade levels in general, and differences in levels of engagement as a combination of both program type and grade level. Similar trends did not emerge across the three indicators of cognitive engagement, but varied according to the specific construct reflected in the individual indicator.

Table 10

Mean Levels of Behavioral Engagement by Program Type and Grade Level (n = 723)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	4.24	4.10	78	2.72	3.14	79	3.47	3.72	157	.31
10	5.26	4.64	106	3.38	3.40	81	4.45	4.25	187	.39
11	6.87	6.15	124	3.64	4.17	67	5.74	5.73	191	.67
12	5.60	5.77	107	4.95	4.66	81	5.32	5.32	188	.13
Combined	5.64	5.40	415	3.68	3.95	308	4.80	4.93	723	.40

Note. Behavioral engagement = attendance, with larger numbers indicating more absences.

Affective engagement. Two separate two-way between-groups ANOVAs were conducted for the two indicators of affective engagement: Attitude Toward Teachers and Attitude Toward School. For Attitude Toward Teachers, the analysis revealed no significant main effects for grade level, $F(3, 719) = 1.02, p > .05$ or program type $F(3, 719) = .13$ $p > .05$ (see Table 14). The interaction between grade level and program type was also not significant, $F(3, 719) = 2.49$ $p > .05$. In sum, participants' from different grade levels and programs had similar average Attitudes Toward Teachers.

Table 11

Mean Levels of Academic Self-Perception by Program Type and Grade Level (N =727)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	5.55	.81	78	5.30	1.09	79	5.42	.97	157	.27
10	5.68	.95	106	5.37	.91	82	5.55	.95	188	.33
11	5.51	.95	124	5.53	.85	67	5.52	.92	191	-.02
12	5.77	.87	107	5.25	.97	84	5.54	.95	191	.56
Combined	5.63	.91	415	5.35	.96	312	5.51	.94	727	.30

Table 12

Mean Levels of Motivation/Self-Regulation by Program Type and Grade Level (N =727)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	5.31	1.01	78	5.40	1.06	79	5.36	1.04	157	-.08
10	5.45	.88	106	5.27	.99	82	5.37	.93	188	.17
11	5.08	1.09	124	5.57	.87	67	5.25	1.04	191	-.46
12	5.10	1.24	107	5.06	1.17	84	5.08	1.21	191	.04
Combined	5.22	1.08	415	5.31	1.05	312	5.26	1.07	727	-.08

Regarding Attitude Toward School, the analysis revealed significant main effects for both grade level, $F(3, 719) = 6.90, p = .0001$ and program type, $F(3, 719) = 31.96, p < .0001$ (see Table 15). Tukey's HSD test indicated that students in 9th and 10th grade

Table 13

Mean Levels of Goal Valuation by Program Type and Grade Level (N =727)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*n*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	6.53	.77	78	6.51	.75	79	6.52	.75	157	.03
10	6.60	.57	106	6.55	.66	82	6.57	.61	188	.07
11	6.53	.67	124	6.67	.48	67	6.58	.61	191	-.20
12	6.43	.80	107	6.33	.75	84	6.39	.78	191	.14
Combined	6.52	.70	415	6.51	.68	312	6.52	.69	727	.01

Table 14

Mean Levels of Attitude Toward Teachers by Program Type and Grade Level (N =727)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	4.79	1.07	78	4.69	1.15	79	4.74	1.11	157	.09
10	5.00	1.09	106	4.77	1.01	82	4.90	1.06	188	.21
11	4.76	1.15	124	5.12	.80	67	4.88	1.06	191	-.33
12	4.86	1.27	107	4.94	.97	84	4.89	1.15	191	-.07
Combined	4.85	1.15	415	4.87	1.00	312	4.86	1.09	727	-.02

reported significantly more positive attitudes and feelings toward school than students in 11th and 12th grade ($p < .05$). Concerning program type, IB students reported significantly more positive attitudes and feelings toward school than AP students ($p < .05$). The interaction between grade level and program type was not significant, $F(3, 719) = 1.39$, p

> .05, indicating that the combination of program type and grade level does not influence students' attitudes and feelings toward school.

Table 15

Mean Levels of Attitude Toward School by Program Type and Grade Level (N =727)

	AP			IB			Combined			Effect Size
Grade	*M*	*SD*	*N*	*M*	*SD*	*N*	*M*	*SD*	*N*	*d*
9	4.64	1.49	78	5.44	1.39	79	5.04	1.49	157	-.54
10	4.92	1.44	106	5.40	1.24	82	5.13	1.37	188	-.32
11	4.26	1.62	124	5.15	1.25	67	4.57	1.56	191	-.60
12	4.38	1.62	107	4.71	1.47	84	4.52	1.56	191	-.22
Combined	4.53	1.57	415	5.17	1.37	312	4.81	1.52	727	-.43

In sum, analyses with the two indicators of affective engagement suggest that students' from different grade levels and programs had similar average Attitudes Toward Teachers, but that IB students and students in their earlier high school years (i.e., 9th and 10th grade) experienced more positive attitudes toward school overall.

Regression Analyses

Three simultaneous multiple regression analyses were conducted to determine the extent to which the indicators of engagement predict academic achievement (i.e., cumulative GPA) and mental health (i.e., global life satisfaction and anxiety). Beta weights and uniqueness indices were reviewed to assess the importance of each predictor variable and provide information on the amount of variance in the three different outcomes of interest that can be accounted for by each specific indicator of engagement independently.

Table 16

Summary of ANOVA Analyses for Grade Level and Program Differences in Student Engagement

Engagement Indicator	Grade Level (*F*-value)	Program Type (*F*-value)	Grade*Program Type (*F*-value)
Academic	41.77*	19.22*	22.43*
Behavioral	5.42*	25.35*	2.24
Cognitive			
ASP	0.43	14.29*	2.54
MSR	2.99*	1.39	3.30*
GLS	3.75*	0.01	0.93
Affective			
ATT	1.02	0.13	2.49
ATS	6.90*	31.96*	1.39

Note. *p < .05. ASP = Academic Self-Perception; MSR = Motivation/Self-Regulation; GLS = Goals; ATT = Attitude Toward Teachers; ATS = Attitude Toward School. Behavioral engagement = attendance, with larger numbers indicating more absences.

Grade level and program type were entered into the regression equations since the aforementioned ANOVA results indicated that these variables are significantly related to at least some of the indicators of student engagement, and thus should be statistically controlled for.

Academic achievement. The linear combination of the demographic predictors (program type, grade level) and indicators of engagement (academic engagement, behavioral engagement, cognitive engagement [Academic Self-Perception, Motivation/Self-Regulation, Goals], affective engagement [Attitude Toward Teachers,

Attitude Toward School]) explained a significant and sizable amount of variance in academic achievement, $F(9, 630) = 17.54$, $p < .0001$, $R^2 = .20$, adjusted $R^2 = .19$. Demographic effects accounted for 0.44% of the variance, and the linear combination of engagement indicators accounted for the remaining 19.56% of variance in students' academic achievement.

To determine which indicators of engagement were unique predictors of academic achievement, the *p*-values for the specific beta weights of each indicator of student engagement were examined. As shown in Table 17, five indicators of student engagement were significant unique predictors of academic achievement: enrollment in AP classes, attendance, Academic Self-Perception, Motivation/Self-Regulation, and Goals. An indicator of cognitive engagement (Academic Self-Perception) emerged as the strongest predictor ($\beta = .20$, $p < .0001$), followed by behavioral engagement ($\beta = -.18$, $p < .0001$), the remaining two indicators of cognitive engagement, Motivation/Self-Regulation ($\beta = .16$, $p < .001$) and Goals ($\beta = .10$, $p < .05$), and academic engagement ($\beta = .14$, $p < .001$). In sum, higher cumulative GPAs were observed among students who had greater confidence in their academic abilities, took more AP classes, held greater motivation and schooling-related goals, and missed fewer days of school.

Life satisfaction. The linear combination of the demographic predictors (program type, grade level) and the seven indicators of engagement explained a significant and sizable amount of variance in life satisfaction, $F(9, 632) = 15.45$, $p < .0001$, $R^2 = .18$, adjusted $R^2 = .17$. Demographic effects accounted for 0.53% of the variance, and the linear combination of engagement indicators accounted for the remaining 17.47% of variance in students' life satisfaction.

Table 17

Simultaneous Multiple Regression Analysis for Engagement Predicting Achievement (n =640)

Variable	*B*	*SE B*	β	Uniqueness index
Program Type	.06	.03	.06	.00
Grade Level	.00	.02	.00	.00
Academic Engagement	.08	.02	.14*	.02
Behavioral Engagement	-.02	.00	-.18*	.03
Cognitive Engagement				
ASP	.09	.02	.20*	.03
MSR	.06	.02	.16*	.01
GLS	.06	.03	.10*	.01
Affective Engagement				
ATT	-.02	.02	-.06	.00
ATS	.01	.01	.04	.00

Note. ASP = Academic Self-Perception; MSR = Motivation/Self-Regulation; GLS = Goals; ATT = Attitude Toward Teachers; ATS = Attitude Toward School. Behavioral engagement = attendance, with larger numbers indicating more absences.

To determine which indicators of engagement were unique predictors of life satisfaction, the *p*-values for the specific beta weights of each indicator of student engagement were examined. As indicated in Table 18, three indicators of student engagement were significant unique predictors of life satisfaction: Academic Self-Perception, Motivation/Self-Regulation, and Attitude Toward School. Academic Self-Perception emerged as the strongest predictor ($\beta = .22, p < .0001$), followed by

Motivation/Self-Regulation (β = .18, $p < .001$), and Attitude Toward School (β = .15, $p < .001$). In sum, students with higher levels of life satisfaction had greater confidence in their academic abilities, and held greater motivation and more positive attitudes toward school.

Table 18

Simultaneous Multiple Regression Analysis for Engagement Predicting Life Satisfaction (N =642)

Variable	*B*	*SE B*	B	Uniqueness index
Program Type	-.11	.07	-.06	.00
Grade Level	.10	.04	.11	.01
Academic Engagement	-.02	.05	-.01	.00
Behavioral Engagement	.00	.01	-.02	.00
Cognitive Engagement				
ASP	.22	.04	.22*	.04
MSR	.16	.04	.18*	.02
GLS	-.06	.06	-.04	.00
Affective Engagement				
ATT	.05	.04	.06	.00
ATS	.09	.03	.15*	.02

Note. ASP = Academic Self-Perception; MSR = Motivation/Self-Regulation; GLS = Goals; ATT = Attitude Toward Teachers; ATS = Attitude Toward School. Behavioral engagement = attendance, with larger numbers indicating more absences.

Anxiety. The linear combination of the demographic predictors (program type, grade level) and indicators of the seven indicators of engagement explained a significant

amount of variance in anxiety, $F(9, 632) = 4.98, p < .0001, R^2 = .07$, adjusted $R^2 = .05$. Demographic effects accounted for 0.83% of the variance, and the linear combination of engagement indicators accounted for the remaining 6.17% of variance in students' anxiety.

Table 19

Simultaneous Multiple Regression Analysis for Engagement Predicting Anxiety (N =642)

Variable	*B*	*SE B*	B	Uniqueness index
Program Type	.05	.05	.05	.00
Grade Level	-.03	.02	-.06	.00
Academic Engagement	.03	.03	.05	.00
Behavioral Engagement	.00	.00	.03	.00
Cognitive Engagement				
ASP	-.14	.02	-.24*	.05
MSR	.04	.03	.07	.00
GLS	.05	.04	.06	.01
Affective Engagement				
ATT	.07	.02	.14*	.01
ATS	-.02	.02	-.05	.00

Note. ASP = Academic Self-Perception; MSR = Motivation/Self-Regulation; GLS = Goals; ATT = Attitude Toward Teachers; ATS = Attitude Toward School. Behavioral engagement = attendance, with larger numbers indicating more absences.

To determine which indicators of engagement were unique predictors of anxiety, the *p*-values for the specific beta weights of each indicator of student engagement were examined. As shown in Table 19, two indicators of student engagement were significant

unique predictors of anxiety: Academic Self-Perception and Attitude Toward Teachers. Academic Self-Perception emerged as the strongest predictor ($\beta = -.24$, $p < .0001$), followed by Attitude Toward Teachers ($\beta = .14$, $p < .01$). In sum, students with greater levels of anxiety tend to experience lower confidence in their academic abilities but hold more positive attitudes towards their teachers.

In sum, student mental health was most highly associated with two types of engagement (cognitive and affective). In contrast, all four forms of engagement predicted GPA. An indicator of cognitive engagement, Academic Self-Perception, uniquely predicted each of the student outcomes measured (i.e., life satisfaction, anxiety, GPA).

CHAPTER V: Discussion

The purposes of this study were to examine all four components of student engagement (i.e., academic, behavioral, cognitive, affective) in high school students enrolled in two popular college-level curricula, and understand how these dimensions of engagement relate to important student outcomes. Specifically, the study examined differences between the dimensions of student engagement between students enrolled in IB programs and AP courses, as well as how student engagement differs across the four-year span of high school in this unique student population. Additionally, this study examined how various indicators of student engagement operate in relation to academic achievement and both positive (i.e., life satisfaction) and negative (i.e., anxiety) indicators of mental health.

This chapter summarizes the results of the current study and discusses the findings in the context of existing literature. First, a discussion of the results and significant findings is presented. Next, implications of these results for school psychologists are presented, followed by a discussion of the current study's limitations. Last, directions for future research are discussed.

Group Differences in Indicators of Student Engagement

The purpose of the first two research questions was to document mean differences in various indicators of student engagement between students enrolled in IB programs and AP courses, as well as differences in levels of engagement between high school students in 9th, 10th, 11th, and 12th grades. Following is a summary of findings that address

the aforementioned research questions, and an integration of the results within the larger body of literature.

Academic engagement. Notably, no known published studies have specifically examined the dimension of academic engagement in high school students. Thus, comparisons to past literature cannot be drawn. In the current study, greater annual enrollment in AP courses was used to index academic engagement. The significant interaction between program type and grade level indicated that AP students were more academically engaged than IB students at the beginning and end of high school (9^{th} and 12^{th} grades), whereas IB students were more academically engaged than AP students in 11^{th} grade. Both AP and IB students reported similar levels of academic engagement in 10^{th} grade.

These findings may in part reflect the curriculum differences (and schedule flexibility and course options available) between AP and IB students in the current sample. AP students typically choose which AP courses to take in a cafeteria-style manner (College Board, 2012a), whereas IB students have a highly sequenced and structured program of study (IBO, 2012b). As such, AP students may have more freedom than IB students to take AP courses throughout their high school careers, which may contribute to the apparently higher level of academic engagement during two grade levels. Results suggest that IB students, on average, only take a relatively higher quantity of AP courses in their junior year of high school. In any event, when academic engagement is operationalized as number of AP courses enrolled in, it appears that academic engagement among high school students in rigorous curricula likely differs as a function of their grade level and their particular program of college-level courses.

Behavioral engagement. The current study utilized the frequency of student absences as an indicator of behavioral engagement, such that higher behavioral engagement was reflected in better attendance (fewer absences). Findings include that 9th and 10th grade students missed significantly less school (i.e., were more behaviorally engaged) than 11th and 12th grade students. Additionally, IB students evidenced higher levels of behavioral engagement (i.e., missed less school) than AP students. The finding that behavioral engagement decreases as students progress from earlier to later grades is consistent with what has been previously reported by other researchers (Marks, 2000; Martin, 2009; Yazzie-Mintz, 2010), though behavioral engagement can be operationalized in several different ways. In Marks' (2000) study, behavioral engagement was operationaized as student attentiveness in class.Yazzie-Mintz (2010) operationalized behavioral engagement as students' participation in extra-curricular activities, interactions with other students, and connections with the greater community the school is located in. Martin (2009) operationalized behavioral engagement as management of learning tasks. Despite the differences in how behavioral engagement has been indexed, the results of the current study are in line with the trend in the literature that as students progress through high school, they experience less behavioral engagement.

The current study is the first known one to compare behavioral engagement between high school students enrolled in different college-level curricula, precluding a direct comparison of between-program differences with findings in past literature. However, past research has found that having a higher SES background predicts higher levels of behavioral engagement (Ripski & Gregory, 2009). A slightly higher proportion of IB students (87%) compared to AP students (78%) in the current study reported

coming from a higher SES background, operationalized as not qualifying for school lunch at a reduced price or for free. Thus, the finding that IB students in the present sample were more behaviorally engaged than the AP students is consistent with previous findings that would generally expect a higher SES population to have better attendance.

Aside from relatively elevated SES, another unique feature of the IB program that may contribute to greater behavioral engagement includes the culture of belongingness and sense of community that is often reported by IB students, parents, and teachers. IB programs typically operate as a distinct entity from the school that they are a part of (e.g., have own bell schedule, separate lunch times). As such, these students may develop particularly supportive and caring relationships with one another. Feeling supported by individuals at school has been linked to students' experiencing greater levels of behavioral engagement (Ripski & Gregory, 2009).

Cognitive engagement. In the current study, student self-report of attitudes and beliefs about schooling was used to provide three different indicators of cognitive engagement: academic self-perceptions (i.e., confidence in academic abilities), motivation and self-regulation (i.e., working hard and being internally motivated to complete schoolwork), and goal valuation (i.e., considering schooling as important to one's career and life goals). Between-group differences were not consistent across these three indicators of cognitive engagement; rather than a similar trend emerging, results varied according to the specific construct reflected in the aforementioned individual indicators.

Regarding academic self-perceptions, AP students reported, on average, greater confidence in their academic skills in relation to IB students. This may be due to the

extremely rigorous nature of the IB program, which requires extensive completion requirements and high expectations for students to meet (IBO, 2012b). It can be argued that while both AP and IB are challenging academic curricula, IB requirements and expectations exceed those of AP courses. The difficulty of completing the IB program may present more opportunities for failure and therefore diminish IB students' confidence in their academic skills as compared to AP students. It is also possible that the more selective entrance requirements in the IB program result in a cohort of highly-skilled youth; students' academic self-perceptions may diminish as a result of social comparison to classmates that are uniformly high-achieving and ambitious. AP students, in contrast, may benefit from having at least some courses with typically-achieving peers in their school's general education program.

The current study found that in 10th grade, AP students reported higher levels of motivation and self-regulation of their academic-related behavior than IB students. The reverse trend was found in 11th grade, when IB students evidenced greater mean levels of motivation and self-regulation. Thus, in contrast to a uniform effect of program type on motivation and self-regulation as an indicator of cognitive engagement among high-achieving high school students, student grade level matters and the two groups may often be more similar than different (as 9th and 12th grade IB and AP students reported similar levels of motivation). It was hypothesized that IB students would demonstrate significantly higher levels of student engagement than AP students for each component of engagement, including the cognitive indicator of motivation and self-regulation. This hypothesis was only supported for 11th grade students. Moreover, AP students' motivation and self-regulation actually surpassed that of IB students in 10th grade. IB

students transition from being in the pre-IB to the IB diploma program between the 10th and 11th grades. It may be that this transition requires students to become more autonomous in their learning, resulting in IB students taking on a more active role in their learning, as well as boosting their motivation to excel in their academic pursuits. Conversely, AP students may be more motivated and self-regulate their own learning better than IB students in the 10th grade due to more exposure to how AP courses are taught. Many AP students may have taken AP courses prior to the 10th grade, resulting in familiarity of expectations for performance in AP courses, which in turn could result in better regulation of their own learning.

With respect to goal valuation, no between-program differences emerged, indicating that students in both AP and IB possess similarly positive beliefs about the importance of schooling to their careers goals. This is in contrast to original hypotheses in which greater valuing of school was expected among IB students, in line with the greater program completion requirements that necessitate a level of personal sacrifice during the pursuit of academic goals. These findings suggest that AP students perceive school as similarly important to their future goals compared to IB students. Thus, it appears that enrollment in college-level courses in general, rather than enrollment in a specific type of college-level curricula, is associated with students who value school and view it as important to their future endeavors.

Main effects of grade level were detected, however, in that 10th and 11th grade students reported significantly higher school-related goals than students in 12th grade. This finding is similar to Yazzie-Mintz (2010) study of 42,754 high school students, which operationalized cognitive engagement as students' preparation for class,

discussions in class, and the level of academic challenge students report; all dimensions of engagement were the lowest in 12th grade students.

Given such trends in the literature, it is somewhat surprising that goal valuation was the only one of the three indicators of cognitive engagement for which the current study found a decreasing trend across 9th to 12th grades. This may be due to how other researchers have defined and studied cognitive engagement, as there is a wide range in how to best measure various dimensions of engagement. Another reason for the current study's limited consistency with the literature is that current study sought to determine not only if there were grade level differences in various indicators of student engagement, but also program differences and interactions between grade level and program type. Past research has not been as interested in determining if grade level differences in engagement depend on other variables such as different types of academic programming.

The only other studies that have examined cognitive engagement in high-achieving high school students have compared IB students (Shaunessy et al., 2006) or advanced students (Yazzie-Mintz, 2010) to general education students, or have compared intellectually gifted high-achieving and low-achieving students to each other (McCoach & Siegle, 2003a). Thus, no known studies have compared indicators of cognitive engagement between two high-achieving groups of students in different curricula (e.g., AP and IB), precluding direct comparisons of current results to any past findings. However, the higher entrance and completion requirements of IB led this researcher to expect higher levels of student engagement among IB students in relation to AP students for each of the components of engagement, including cognitive. This hypothesis was not supported, as IB students did not emerge across grade levels or indicators as clearly more

cognitively engaged than AP students. Despite the higher entrance and completion requirements of IB relative to AP, it is possible that once students decide to pursue whatever college-level course(s)/program(s) are available at their school, students are more similar than different in respect to their academic-related goals and values, motivation to succeed in their coursework, and self-regulation of their school behaviors. It is possible that the rigor of college-level curricula (both AP and IB) attracts motivated, hard working, and goal oriented students in general.

Affective engagement. Student self-report of attitudes towards the school context was used to provide two separate indicators of affective engagement: attitudes toward teachers (i.e., students' liking their teachers, and believing their teachers care about them) and attitudes toward school (i.e., students' liking, and having pride, in their school). A consistent trend of between-group differences did not emerge across these two indicators of affective engagement. Students of all grade levels and in both program types reported similarly mildly positive attitudes towards teachers (mean scores around 5 on a 1 to 7 scale, regardless of group), but differences were observed in attitudes towards their school as a function of grade and program type. Specifically, underclassmen reported more positive attitudes and feelings toward school than upperclassmen (i.e., students in 11^{th} and 12^{th} grades), and IB students held more positive attitudes and feelings toward school than AP students.

No known studies have compared indicators of affective engagement between two high-achieving groups of students in different curricula, such as AP and IB, precluding direct comparisons of current results to past findings. However, some researchers have examined students' attitudes toward teachers between IB and general education students,

and between high achieving and under-achieving gifted students (Shaunessy et al., 2006: McCoach & Siegle, 2003a, respectively). These studies found that IB students held particularly positive attitudes toward their teachers relative to general education students (Shaunessy et al., 2006), and high achieving gifted students held more positive attitudes toward their teachers than underachieving gifted students (McCoach & Siegle, 2003a). Thus, the finding in the current study that AP and IB students held similarly high positive attitudes towards teachers is in line with the notion that both AP and IB students can be considered high-achieving students. Additionally, it may be that high school teachers within college-level curricula possess a certain valuable skill set and/or are more passionate about teaching as compared to general education teachers. Thus, they may be more able to engage their students in the classroom, accounting for their students' overall positive attitudes towards them.

In the current study, IB students and students in their earlier high school years (i.e., 9th and 10th grade) reported more positive attitudes toward school overall. With respect to the program-wide difference favoring IB students, Shaunessy et al. (2006) also found that IB students held more positive attitudes toward school (assessed via student self-report on the School Climate scale of the SCS; Haynes, Emmons, & Ben-Avie, 2001) than their peers in the general education program at the same school. The IB program requires students to complete requirements that foster connections between the school and community (i.e., community service hours), which may account for IB students in particular to possess more positive attitudes toward school than other groups of high school students. Additionally, the IB program's philosophy of instilling independent and

critical thinking in students may create and substantiate highly positive attitudes toward the schooling experience relative to other high school academic programming.

The finding that students in their earlier high school years experienced more positive attitudes toward school than students in their later high school years is similar to what has been found in past research with affective engagement. Yazzie-Mintz (2009) operationalized affective engagement as students' self-report about their general feelings regarding school and level of support students perceive from members of the school community, and also found that 9th grade students had higher levels of affective engagement than students in their later high school years.

Overall, the above results regarding differences in the dimensions of student engagement between students in the 9th, 10th, 11th, and 12th grades are somewhat consistent with previous research, particularly in that multiple indicators of engagement displaying a decreasing trend across 9th to 12th grade (Marks, 2000; Martin, 2009; Yazzie-Mintz, 2010). The current study was unique in that it examined multiple indicators of some dimensions of engagement (i.e., cognitive, affective), which provides for a more nuanced understanding of what aspects of a given construct may be expected to decline as students' age. The current study suggests that positive attitudes toward school (i.e., indicator of affective engagement), having academic-related goals (i.e., indicator of cognitive engagement), and school attendance (i.e., indicator of behavioral engagement) may be the most likely aspects of engagement to evidence the diminishing trend across grade levels, whereas engagement in the areas of positive attitudes towards teachers (i.e., indicator of affective engagement), confidence in academic abilities and motivation and self-regulation of school behaviors (i.e., indicators of cognitive engagement) may be

more robust to changes as a function of age within this unique population of high-achieving students in rigorous curricula.

Finally, regarding curriculum differences in engagement, although this researcher hypothesized higher engagement would be evident in the IB students, in actuality IB students were only more engaged than AP students in regards to a few dimensions. Specifically, IB students evidenced better attendance (i.e., behavioral engagement), and more positive attitudes towards school (i.e., affective engagement) than AP students. In contrast, AP students evidenced more confidence in their academic abilities (i.e., cognitive engagement) than IB students. Finally, levels of academic engagement as well as one aspect of cognitive engagement (i.e., motivation and self-regulation) were dependent on an interaction between grade level and program type.

Overall and Unique Contributions of Student Engagement Indicators to Academic Achievement

The current study investigated the overall contribution of the aforementioned indicators of student engagement to academic achievement, as evidenced by unweighted cumulative GPA, as well as the unique influence of each indicator on GPA. Results revealed that all seven student engagement indicators taken together accounted for 19.56% of the variance in students' unweighted GPA scores, which supports this researcher's hypothesis that student engagement would explain a statistically significant and meaningful amount of variance in students' academic achievement. Previous research has also identified a predictive relationship between student engagement and GPA, with engagement explaining around 23% of the variance in GPA for high school students (Marks, 2000).

Further investigation of the unique contribution of each indicator of engagement on academic achievement allowed for a more complete understanding of how academic achievement is related to specific indicators of student engagement. It was hypothesized that indicators within the cognitive and affective domains of student engagement would be the strongest contributors. Consistent with that expectation, all three indicators of cognitive engagement emerged as unique and positive predictors of students' GPA. This underscores the importance of the connections between students' school-related efficacy, valuing school, and motivation, and their actual achievement. In contrast, affective indicators of student engagement did not emerge as unique predictors. For high school students in college-level curricula, it appears that factors such as liking teachers and one's school in general are not as independently critical to students' academic success. It may be that these students are so highly motivated to achieve in school and confident in their academic skills, that their affect toward teachers and the school itself are not as relevant as the cognitive factors in determining their achievement levels.

Two indicators of student engagement other than cognitive engagement emerged as significant unique predictors of academic achievement: enrollment in AP courses (academic engagement) and attendance (behavioral engagement). These findings support previous literature that has also linked student engagement to better achievement-related outcomes (Appleton et al., 2006; Carini, Kuh, & Klein, 2006). Appleton et al. (2006) found that the academic dimension of student engagement is related to students' grades, performance on standardized tests, and graduation from high school. Carini, Kuh, and Klein (2006) examined indicators of all four domains of student engagement and found

predictive relationships between student GPA and nine of the 11 indicators of engagement.

In sum, results of the current study indicate that students are more likely to have higher academic achievement when they are confident in their academic abilities, enroll in more AP courses, are more motivated and hold more school-related goals, and when they miss less school. The current study's results partially support the hypotheses made that student engagement, particularly affective and cognitive indicators, would explain a significant and meaningful amount of variance in academic achievement. Student engagement did explain a significant and large amount of variance in unweighted GPA, and students' cognitive engagement consistently evidenced positive and unique associations with achievement. However, affective indicators of engagement did not emerge as uniquely associated with individual differences in achievement.

Overall and Unique Contributions of Student Engagement Indicators to Life Satisfaction

The current study found that the seven student engagement indicators, taken together, accounted for 17.47% of the variance in life satisfaction, supporting the hypothesis that student engagement would explain a significant and large amount of variance in students' levels of life satisfaction. Previous research has also documented a predictive relationship between student engagement, specifically cognitive engagement, and life satisfaction. Lewis et al. (2011) found that cognitive engagement (assessed via student self-report on the Future Aspirations and Goals subscale of the SEI; Appleton et al., 2006) accounted for 12% of the variance in students' life satisfaction.

Further investigation of the unique contribution of each indicator of engagement on life satisfaction allowed for a more complete understanding of how life satisfaction is related to specific aspects of student engagement. It was hypothesized that indicators within the cognitive and affective domains of student engagement would be the strongest contributors. Similar to the aforementioned findings in relation to academic achievement, two indicators of cognitive engagement (academic self-perceptions and motivation/self-regulation) emerged as the strongest unique predictors of students' life satisfaction.

Only one other indicator of student engagement emerged as a significant unique predictor of life satisfaction: positive attitudes toward school (affective engagement). These results support the initial hypotheses made that cognitive and affective indicators of engagement would evidence the greatest associations with life satisfaction, and are in line with previous findings. For instance, Reschly et al. (2008), through cross-sectionally exploring the link between student engagement and a different indicator of students' well-being (i.e., positive affect), found that higher levels of indicators of both cognitive engagement (assessed via student self-report on the Future Aspirations and Goals and Control and Relevance subscales of the SEI; Appleton et al., 2006) and affective engagement (assessed via student self-report on the Peer Support for Learning, Teacher-Student Relationships, and Family Support for Learning subscales of the SEI; Appleton et al., 2006) co-occurred with greater positive affect. Additionally, Lewis et al. (2009) found that students' levels of positive affect predicted both cognitive and affective engagement (also assessed via student self-report on the SEI) from the fall to spring of one school year. Thus, students' well-being has been demonstrated to have both a correlational and predictive relationship with indicators of both cognitive and affective

engagement. Additionally, student engagement and life satisfaction have been shown to have a bi-directional relationship with one another, such that higher levels of engagement predicts higher levels of life satisfaction, and vice versa (Lewis et al., 2011).

In sum, results of the current study indicate that students are more likely to have higher life satisfaction when they have greater confidence in their academic abilities, have greater motivation for achievement, and hold more positive attitudes toward their school. The initial hypotheses made by this researcher were thus supported by the current sample consisting of relatively high-achieving high school students pursuing college-level curricula. The relevance of cognitive and affective engagement is consistent with conclusions from past research, but the current study's findings advance the literature by examining indicators of all four dimensions of student engagement in relation to life satisfaction among students across the high school years. Prior research has neglected to include indicators of academic engagement in relation to life satisfaction, and has only included students up to the 10th grade in its sample (Lewis et al., 2009; Lewis et al., 2011; Reschly et al., 2008). The current study thus extends and isolates the importance of cognitive and affective engagement to adolescent life satisfaction.

Overall and Unique Contributions of Student Engagement Indicators to Anxiety

The current study's results revealed that all seven student engagement indicators taken together accounted for 6.17% of the variance in anxiety, which supports this researcher's initial hypothesis that engagement would account for a statistically significant amount of variance in students' levels of anxiety, although the percent of variance accounted for is relatively small. Previous research has also indicated a link between student engagement, specifically affective engagement (assessed via student

self-report on the PSSM; Goodenow, 1993), and anxiety (assessed via student self-report on the SCAS; Spence, 1998), with lower levels of affective engagement linked to higher levels of anxiety (r = -.40; Schochet et al., 2006). Moreover, Schochet et al. (2006) also found that higher levels of affective engagement predicted less anxiety symptoms later. Specifically, Schochet et al. (2006) found an ordinary least squares of -1.81, meaning that for every 1 unit increase of school connectedness there was a corresponding decrease of -1.81 units in anxiety.

Further investigation of the unique contribution of each indicator of engagement on anxiety allowed for a more complete understanding of how anxiety is related to specific indicators of student engagement. It was hypothesized that indicators within the cognitive and affective domains of student engagement would be the strongest contributors, in an inverse direction. In line with these expectations, academic self-perceptions, an indicator of cognitive engagement, emerged as the strongest unique predictor of students' anxiety. Specifically, students with lower confidence in their academic abilities experienced greater levels of anxiety. Notably, academic self-perceptions appear relevant in relation to a host of important student outcomes, and high levels are consistently linked to better student functioning.

In contrast to hypotheses, the other indicator of student engagement to emerge as a significant unique predictor of anxiety—attitudes towards teachers—evidenced a positive relationship with this indicator of worse functioning. Specifically, students with more positive attitudes toward their teachers tended to report more symptoms of clinical anxiety disorders. This is an unanticipated finding and contrary to the current literature, which has generally found the opposite to be true. For instance, Schochet et al. (2006)

found that students with more positive attitudes toward their teachers and peers (assessed via student self-report on the PSSM; Goodenow, 1993) experienced lower levels of anxiety (assessed via student self-report on the SCAS; Spence, 1998). The current study's findings may differ from prior research findings due to the uniquely high-achieving nature of the students included in the current study's sample. These students, who hold generally positive attitudes toward their teachers (mean levels around 5 on a scale of 1 to 7) may be particularly inclined to impress their teachers. Such striving for acceptance may result in students placing more pressure on themselves, and consequently experiencing higher overall levels of anxiety (e.g., symptoms of harm avoidance and fears of social evaluation). Conversely, it may be that students who experience greater clinical anxiety elicit more support from their teachers, which may provide educators with opportunities to convey support and engender positive feelings.

In sum, results of the current study indicate that students are more likely to have higher levels of anxiety when they have lower confidence in their academic abilities, and when they hold more positive attitudes toward their teachers. The initial hypotheses made by this researcher were partially supported. Student engagement indicators accounted for a significant, albeit relatively small, amount of variance in students' levels of anxiety. Moreover, cognitive and affective indicators (i.e., academic self-perceptions, positive attitudes toward teachers) evidenced the highest associations with anxiety. The former finding specific to cognitive engagement is consistent with conclusions from past research, but links with affective engagement are novel. Prior research has neglected to include indicators of academic, behavioral, and cognitive engagement in relation to anxiety, and has only included middle school students in its sample (Schochet et al.,

2006). This first study of multidimensional engagement within an older sample paints a somewhat more complex picture of how cognitive and affective engagement relate to psychopathology, and suggests behavioral and academic indicators may be less relevant.

Implications for School Psychologists

Student engagement is a construct of increasing interest among educators, including school psychologists. A decreasing trend in student engagement has been noted in the literature, with levels of engagement typically decreasing as students progress through their educational careers (Marks, 2000; Martin, 2009; Yazzie-Mintz, 2010). This phenomenon is troubling for educators, as lower levels of student engagement have been linked to a host of concerns and negative outcomes, including poorer academic performance, higher levels of both internalizing and externalizing mental health problems, diminished life satisfaction, negative affect, and school dropout (Appleton et al., 2008; Betts et al., 2010; Hirschfield & Gasper, 2011; Lewis et al., 2009; Lewis et al., 2011; Reschly et al., 2008; Sander et al., 2010; Schochet et al., 2006). Contrarily, higher levels of student engagement have been linked to more positive academic and social-emotional outcomes (Appelton et al., 2008; Reschly et al., 2008). Fortunately, student engagement has been identified as malleable, and as such, various dimensions can be targeted for intervention to increase levels of student engagement as needed (Kortering & Braziel, 2008).

Preliminary findings suggest that students enrolled in rigorous academic curricula experience higher levels of student engagement than their general education counterparts, but the differences in levels of engagement between students enrolled in two popular college-level curricula (i.e., AP, IB) were unexplored previous to the current study

(Shaunessy et al., 2006; Yazzie-Mintz, 2010). Furthermore, the current study contributes to school psychologists understanding of similarities and differences in engagement among students in two increasingly popular college-level curricula.

By delineating specific indicators of engagement that link to students' achievement and mental health, and by understanding differences in AP and IB students' levels of engagement, this study provides school psychologists with a clearer idea of where to focus their efforts in terms of student-focused prevention and intervention targets. Findings underscore the importance of providing teacher and school administrator consultation, as well as individual or group counseling to provide skills and resources matched to students' needs. Specifically, school psychologists could provide consultation to school administrators to assist in fostering an overall positive school climate, as students' attitudes toward school emerged as an important indicator of affective engagement that contributed to students' global levels of life satisfaction. Additionally, as differences in students' attitudes toward school emerged in relation to grade level (i.e., students in 9^{th} and 10^{th} grades reported more positive attitudes toward school than students in 11^{th} and 12^{th} grades) and program type (i.e., IB students reported more positive attitudes toward school than AP students), school psychologists could assist schools in focusing their efforts on ways to instill school pride among students enrolled in AP courses, as well as in their juniors and seniors. School psychologists may also work in collaboration with school-level teams to improve student attendance, an indicator of behavioral engagement that contributed to students' academic achievement in the current study. Positive Behavior Supports strategies, which school psychologists are often very knowledgeable about, include attendance components. Since AP students and

students in the later high school grades have significantly more absences than IB students and students in the earlier high school grades, it may be particularly prudent to help school-level teams identify potential barriers to students' school attendance and select appropriate data-based interventions to implement.

In addition to consulting with school-level personnel, school psychologists could work with students directly to increase their self-efficacy within the academic domain, motivation and self-regulation of their learning, and their academic-related goals. Students' confidence in their academic abilities, motivation and self-regulation of their learning, and personal school-related goals emerged as indicators of cognitive engagement that contributed significantly to students' levels of either anxiety, life satisfaction, and GPA. Academic self-perceptions, in particular, emerged as a particularly robust predictor as it was uniquely associated with more adaptive levels of each outcome. Increasing students' self-confidence in their academic competency through individual or small group counseling may result in students' decreasing levels of anxiety, increasing levels of life satisfaction, and improving academic performance. Bandura (1997) recommends enhancing confidence in one's beliefs in a given domain (e.g., academic) through the following pathways: enactive mastery experiences, vicarious experiences, verbal persuasion, and impacting one's physiological and affective states (e.g., helping one's emotional reaction to subjective environmental threats). Regarding the role of self-regulation of learning, school psychologists can work with students to improve their task-management and studying skills by helping them determine how much time to devote to various school-related tasks and posing several different strategies for learning and retaining school material. Regarding the role of goal valuation, school

psychologists can help students to create and monitor progress toward reaching personal academic-related goals, and help make explicit links between high school success and personal/occupational goals. Both improved self-regulation of learning and goal valuation can lead to increases in students' global life satisfaction and improve their academic achievement.

Moreover, school psychologists may work in collaboration with IB program faculty to improve IB students' confidence in their academic abilities, as they reported significantly poorer academic self-perceptions than their AP counterparts. In particular, school psychologists may want to reiterate to IB faculty and students the extreme rigor of the IB curriculum, and how this may result in lower perceived academic-related competence. Teachers may be more motivated to provide opportunities to foster positive academic self-perceptions by implementing Bandura's (1997) recommended strategies if informed of the critical links between such positive beliefs and students' academic and psychological outcomes. Specifically, teachers could provide students opportunities to excel in the classroom through skill-building via mastery-oriented learning experiences that are challenging, yet attainable, and allow students to learn from set-backs and constructive feedback. Teachers could also require students to self-monitor their personal academic successes, which has also been linked to improvement in academic self-efficacy. Social comparisons, by which students compare their performance on exams and assignments to their classmates, for example, is another way that self-efficacy can be raised. Thus, teachers could assign each student an identification number known only to the student and teacher, and publicly post each students' grades for assignments as a way for students to gauge their performance relative to others'. This could foster the mindset

in students that they can perform well on assignments if others are too. However, teachers would have to be cautious of students who may learn that they are doing comparatively worse than their peers, which may subsequently harm their self-efficacy.

In essence, the current study provides further rationale for school psychologists to provide services that aim to promote and increase students' engagement, particularly within the affective, cognitive, and behavioral domains, as they are linked to important mental health and academic outcomes among students. These services can be provided indirectly through working with administrators and teachers, as well as directly through provision of individual student and small group counseling.

Contributions to the Literature

There has been a paucity of research examining all four dimensions of student engagement in relation to important student outcomes. Moreover, virtually no research has been conducted to examine the link between student engagement and student outcomes among students enrolled in college-level curricula. The current study provides further understanding of how various indicators of student engagement can differ among students in two popular college-level curricula (i.e., IB, AP), and how various indicators of engagement relate to both positive and negative indicators of mental health (life satisfaction and anxiety, respectively), as well as GPA among a sample of students enrolled in rigorous academic programming. The current study clarifies that academic self-perceptions, or confidence in academic abilities (an indicator of cognitive engagement), in particular is implicated in students' levels of anxiety and life satisfaction, in addition to their GPA. Students with more confidence in their academic skills tend to have lower levels of anxiety, higher levels of life satisfaction, and higher GPAs. Several

other indicators of student engagement, most notably indicators of cognitive engagement, also predicted student outcomes. One particularly interesting and unanticipated finding of the current study was that students' more positive attitudes toward teachers, an indicator of affective engagement, predicted higher levels of anxiety.

Additionally, the current study found several differences in individual indicators of engagement based on program type, grade level, and a combination of program type and grade level. In line with hypotheses, IB students displayed higher levels of behavioral engagement (i.e., missed less school) and more positive attitudes toward school than AP students (i.e., missed less school). In contrast to expectations, AP students displayed more confidence in their academic abilities than IB students, and the two groups had similar attitudes toward their teachers (i.e., Thus, IB students are underrepresented in analyses affective engagement) and were similar in terms of their goal valuation (i.e., cognitive engagement). Regarding grade level differences, students in their earlier high school years reported having more school-related goals, more positive attitudes toward school, and more behavioral engagement (i.e., fewer absences) than students in their later high school years. These findings extend the phenomenon of diminishing engagement across the high school years to include students enrolled in college-level courses.

In terms of interactions between program type and grade level, AP 10th grade students reported significantly higher motivation and self-regulation of their learning than IB 10th grade students, with the reverse trend apparent in students in 11th grade. Additionally, in the 9th and 12th grades, AP students reported significantly higher levels of academic engagement (i.e., enrollment in AP courses), whereas in 11th grade, IB students reported significantly higher levels of academic engagement. In sum, the current

study indicates that student engagement predicts important student mental health and academic outcomes, notes discrepancies in levels of engagement among IB and AP students, and identifies differences in engagement for students at various points in their high school careers.

Limitations

A potential limitation of this study is the heavy reliance on student self-report data, which may be biased in terms of accuracy and socially desirable responding. Regarding accuracy, it is assumed (but not confirmed) that students could recall the total number of AP courses they took throughout their high school years. Further, only gathering data on engagement and mental health from the students' perspective precludes a comprehensive multi-method assessment of these constructs by not taking the perspective of other key stakeholders (e.g., teachers, parents) into account. Importantly, participants may feel compelled to respond in socially desirable ways when self-reporting their own behaviors. This may be particularly true for high-achieving students reporting their own attitudes, beliefs, and behaviors related to school.

Another limitation to the current study is that participation rates are approximations. The research team did not request data from the recruiting teachers on the number of students that actually received parent consent forms; thus, it was estimated that 200 students were recruited per school, resulting in the approximate student participation rates summarized above. Because the research team only provided each school with enough copies of the parent consent form packets to recruit eight classes of students per school (i.e., approximately 200 students per school), it is unlikely that a given school's response rate is an overestimate.

Third, the sole indicator used to measure academic engagement (i.e., student self-report of number of AP classes taken) may be biased against IB students. The IB program does not offer as much flexibility when selecting coursework and schools vary in the extent to which they incorporate AP classes into the IB program's curriculum and/or permit IB students to take additional AP courses (as electives, for example). A total of 76 IB students did not report the number of AP courses they had taken at the time of data collection. Thus, IB students are underrepresented in analyses involving academic engagement, as roughly one-quarter of this subgroup did not provide a response to the relevant survey item.

Another limitation of this study is the cross-sectional nature of the dataset. Student data were only collected at one point in time. As such, statements of causality cannot be drawn between students' attitudes and behaviors related to schooling and student outcomes such as mental health and academic achievement.

Finally, the indicators of the various engagement dimensions were limited due to the archival nature of the dataset. While multiple indicators of affective and cognitive engagement were included in the dataset, it would have been ideal to have additional indicators of academic and behavioral engagement available, such as credit hours earned and time on task (indicators of academic engagement), as well as participation in classroom discussions and activities, and extra-curricular activities (indicators of behavioral engagement).

Future Directions

In order to provide further understanding of how various dimensions of student engagement are linked to student outcomes there are several future directions for

research. To address gaps in the literature, future research should examine the relationship between the various dimensions and indicators of student engagement and student outcomes over time (e.g., mental health, academic achievement). Such studies would help build empirical rationales for where to intervene and how to improve student engagement in order to improve student outcomes.

It would also be beneficial for future research to examine more indicators of the various dimensions of student engagement simultaneously in order to gain a more comprehensive understanding of the relationship between engagement and student outcomes. Specifically, it would be valuable to include more indicators of behavioral engagement (e.g., participation in classroom discussions and activities, involvement in extra-curricular activities), academic engagement (e.g., credit hours earned, homework completion, time on task), and affective engagement (e.g., peer and parental support of learning/emotional support). The current study was unique in examining indicators in each of the four domains of engagement, but including more indicators of a given domain of engagement would be beneficial.

Future researchers should also include more comprehensive student outcome measures. The current study included anxiety as an indicator of psychopathology. Anxiety is one of many forms of internalizing psychopathology; thus, the current study had a limited picture of internalizing problems and no indicators of externalizing psychopathology. Including indicators of both internalizing and externalizing psychopathology would paint a more comprehensive picture of how engagement relates to mental health.

Another direction for future research is to further explore the differences in engagement between students in various college-level curricula, including AP and IB, but also extending to other college-level programming such as dual-enrollment. This is the first known study to compare dimensions of student engagement between two increasingly popular college-level curricula. More studies are needed to determine if the differences found in the current study are replicable across different groups over time. Furthermore, students are also increasingly pursuing dual-enrollment while in high school, where they take some courses at their high school while also enrolling in college-level courses at a nearby college. Including dual-enrollment students in future studies would be beneficial to determine how these students differ from other subgroups of students enrolled in college-level curricula. It may also be prudent for researchers to include a sizeable group of general education students within the larger study sample in order to permit comparisons between students enrolled in college-level curricula and their general education counterparts.

Summary

In conclusion, the current study has expanded the available literature by examining differences in indicators of all four dimensions of student engagement between students enrolled in two popular college-level curricula, and by examining the relationship between student engagement and student outcomes (i.e., life satisfaction, anxiety, GPA). Specifically, the current study was the first to investigate differences between students enrolled in AP classes and IB programs in levels of all four dimensions of student engagement (i.e., academic, behavioral, cognitive, affective). Additionally, the current study was the first to examine how student engagement relates to important

student outcomes (i.e., life satisfaction, anxiety, GPA) among a sample of high-achieving youth.

Several differences in levels of engagement were found between students as a function of program type, grade level, and a combination of program type and grade level. Additionally, several indicators of student engagement predicted important student outcomes. Specifically, students' levels of anxiety were uniquely predicted by their academic self-perceptions and attitudes toward teachers. Students' levels of life satisfaction were uniquely predicted by their levels of cognitive and affective engagement. Students' GPA were uniquely predicted by all engagement domains except affective. An indicator of cognitive engagement, academic self-perception, emerged as a unique predictor of each student outcome measured.

Ties between student engagement and negative and positive student outcomes underscores the importance of continuing to investigate this construct in high school students, in order to inform prevention and intervention services. This is particularly true for high school students enrolled in college-level curricula, as they are a growing subgroup in education but have previously been largely ignored in the research literature.

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Appendix A: Demographics Form

(Modified to fit in current document)

Spring 2011 (Study 6) School:_____ Version:_____ Code #: _____

---

1. I am in grade: 9 10 11 12

2. My age is: 13 14 15 16 17 18 19 20

3. My gender is: Male Female

4. My GPA is: (*please leave blank [do NOT guess] if you do not know*)

   a. Weighted?_____ b. Unweighted? _____

5. Are you currently in a pre-IB or IB program? Yes No

   a) What year did you start the IB program? 9 10 11 12

6. Are you currently taking Advanced Placement (AP) classes? Yes No

   a) What year did you start taking AP classes? 9 10 11 12

   b) How many AP classes are you currently taking? _____

   c) How many AP classes have you completed? _____

7. <u>In middle school</u>, were you:

   a. in an IB school? Yes No Which school? _____

   b. in a magnet program? Yes No Which program? _____

   c. in honors classes? Yes No

   d. in a gifted program? Yes No

10. Do you receive free or reduced-price school lunch? Yes No

11. Are you of Hispanic, Latino, or Spanish origin?

    A. No, not of Hispanic, Latino, or Spanish origin B. Yes, Mexican, Mexican American, Chicano

    C. Yes, Puerto Rican D. Yes, Cuban

    E. Yes, another Hispanic, Latino, or Spanish origin (*please specify)*:_____

12. What is your race? (*bubble in all that apply*)

    A. White B. Black or African American C. American Indian or Alaska Native D. Asian

    E. Native Hawaiian and Other Pacific Islander F. Other (*please specify)*: _____

13. My father's highest education level is:

    A. 8th grade or less B. Some high school, did not complete C. High school diploma/GED

    D. Some college, did not complete E. College/university degree F. Master's degree

    G. Doctoral level degree (Ph.D., M.D.) or other degree beyond Master's level

14. My mother's highest education level is:

    A. 8th grade or less B. Some high school, did not complete C. High school diploma/GED

    D. Some college, did not complete E. College/university degree F. Master's degree

    G. Doctoral level degree (Ph.D., M.D.) or other degree beyond Master's level

15. My biological parents are:

    A. Married B. Divorced C. Separated D. Never married

    E. Never married but living together F. Widowed

Appendix A: Continued

16. Which adult(s) do you live with most of the time?

. A. Mother and Father B. Mother only C. Father only D. Mother and Step-father (or partner)
E. Father and Step-mother (or partner) F. Grandparent(s)
G. Other relative (*please specify*): _____
H. Other (*please specify*): _____

Appendix B: School Attitude Assessment Survey-Revised (SAAS-R)

Please rate how strongly you agree or disagree with the following statements. In answering each question, use a range from (**1**) to (**7**) where (**1**) stands for **strongly <u>dis</u>agree** and (**7**) stands for **strongly agree**. Please circle only one response choice per question.

Appendix B: Continued

Statement:	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1. My classes are interesting.	1	2	3	4	5	6	7
2. I am intelligent.	1	2	3	4	5	6	7
3. I can learn new ideas quickly in school.	1	2	3	4	5	6	7
4. I check my assignments before I turn them in.	1	2	3	4	5	6	7
5. I am smart in school.	1	2	3	4	5	6	7
6. I am glad that I go to this school.	1	2	3	4	5	6	7
7. This is a good school.	1	2	3	4	5	6	7
8. I work hard at school.	1	2	3	4	5	6	7
9. I relate well to my teachers.	1	2	3	4	5	6	7
10. I am self-motivated to do my schoolwork.	1	2	3	4	5	6	7
11. I am good at learning new things in school.	1	2	3	4	5	6	7
12. This school is a good match for me.	1	2	3	4	5	6	7
13. School is easy for me.	1	2	3	4	5	6	7
14. I like my teachers.	1	2	3	4	5	6	7
15. I want to get good grades in school.	1	2	3	4	5	6	7
16. My teachers make learning interesting.	1	2	3	4	5	6	7
17. My teachers care about me.	1	2	3	4	5	6	7
18. Doing well in school is important for my future career goals.	1	2	3	4	5	6	7
19. I like this school.	1	2	3	4	5	6	7
20. I can grasp complex concepts in school.	1	2	3	4	5	6	7
21. Doing well in school is one of my goals.	1	2	3	4	5	6	7
22. I am capable of getting straight A's.	1	2	3	4	5	6	7
23. I am proud of this school.	1	2	3	4	5	6	7
24. I complete my schoolwork regularly.	1	2	3	4	5	6	7
25. It's important to get good grades in school.	1	2	3	4	5	6	7
26. I am organized about my schoolwork.	1	2	3	4	5	6	7
27. I use a variety of strategies to learn new material.	1	2	3	4	5	6	7
28. I want to do my best in school.	1	2	3	4	5	6	7
29. It is important for me to do well in school.	1	2	3	4	5	6	7
30. I spend a lot of time on my schoolwork.	1	2	3	4	5	6	7
31. Most of the teachers at this school are good teachers.	1	2	3	4	5	6	7
32. I am a responsible student.	1	2	3	4	5	6	7
33. I put a lot of effort into my schoolwork.	1	2	3	4	5	6	7
34. I like my classes.	1	2	3	4	5	6	7
35. I concentrate on my schoolwork.	1	2	3	4	5	6	7

Appendix C: Students' Life Satisfaction Scale (SLSS)

We would like to know what thoughts about life you've had during the past several weeks. Think about how you spend each day and night and then think about how your life has been during most of this time. Here are some questions that ask you to indicate your satisfaction with life. In answering each statement, circle a number from (**1**) to (**6**) where (**1**) indicates you **strongly disagree** with the statement and (**6**) indicates you **strongly agree** with the statement.

	Strongly Disagree	**Disagree**	**Slightly Disagree**	**Slightly Agree**	**Agree**	**Strongly Agree**
1. My life is going well	1	2	3	4	5	6
2. My life is just right	1	2	3	4	5	6
3. I would like to change many things in my life	1	2	3	4	5	6
4. I wish I had a different kind of life	1	2	3	4	5	6
5. I have a good life	1	2	3	4	5	6
6. I have what I want in life	1	2	3	4	5	6
7. My life is better than most kids'	1	2	3	4	5	6

Appendix D: Parent Consent Letter
(Modified to fit in current document)

Dear Parent or Caregiver:
This letter provides information about a research study that will be conducted in your child's high school by investigators from the University of South Florida. Our goal in conducting the study is to investigate stress and coping among high school students in academically demanding college preparatory programs in order to understand what factors are linked to their success. This portion of the study will assist us in validating self-report surveys of stress and coping to be used with students in Advanced Placement (AP) courses and International Baccalaureate (IB) Programs.

- ✓ Who We Are: We are Shannon Suldo, Ph.D., and Elizabeth Shaunessy, Ph.D., professors in the College of Education at the University of South Florida (USF). Several graduate students in the USF College of Education are also on the research team. We are planning the study in cooperation with school administrators to ensure the study provides information that will be helpful to the school.

- ✓ Why We Are Requesting Your Child's Participation: This study is being conducted as part of a project entitled, "Predictors of Academic Success among High School Students in College Preparatory Programs." Your child is being asked to participate because he or she is a high school student in a college preparatory program, specifically the International Baccalaureate (IB) Program or Advanced Placement (AP) courses.

- ✓ Why Your Child Should Participate: We need to learn more about what leads to school success and happiness for students in college preparatory programs. The information that we collect from your child may help increase our overall knowledge of stressors and coping strategies among high-achieving students, and how such factors relate to their academic, social, and emotional success. Information from this study will provide a foundation from which to improve the schooling experiences and well-being of high school students in college preparatory programs. Please note neither you nor your child will be paid for your child's participation in the study. However, every student that returns this form (regardless of whether you give permission for your child to participate or not) will be included in a class-wide drawing for a $50 Visa gift card. In order to show our appreciation for your child's participation, each student who participates in the project will receive one pre-paid movie ticket to a local theater.

- ✓ What Participation Requires: If your child is given permission to participate in the study, he or she will be asked to complete several paper-and-pencil surveys. These surveys will ask your child about the following topics: stressors and coping strategies, beliefs about school, and thoughts about his or her well-being. It will take approximately 45-60 minutes to complete the survey during one school day. We will personally administer the surveys at the high school, during regular school hours, this spring to large groups of students who have parent permission to participate. Some students will be asked to complete the same surveys again two weeks later in order to determine the consistency of their responses over time. For these students, total participation will take 60 – 75 minutes. A final part of participation involves a review of your child's school records. School administrators will

  provide the USF research team with your child's grade point average (GPA) and attendance history for this school year..

Appendix D: Continued

- ✓ Confidentiality of Your Child's Responses: There is minimal risk to your child for participating in this research. We will be present during administration of the surveys in order to provide assistance to your child if she or he has any questions or concerns. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than us and our research assistants. Your child's completed surveys will be assigned a code number to protect the confidentiality of his or her responses. Only we will have access to the locked file cabinet stored at USF that will contain: (1) all records linking code numbers to participants' names, and (2) all information gathered from school records. All records from the study (completed surveys, information from school records) will be destroyed in five years. Please note that although your child's specific responses on the surveys will not be shared with the school staff, if your child indicates that he or she intends to harm him or herself, we will contact district mental health counselors to ensure your child's safety.

- ✓ Please Note: Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this study or to withdraw him or her at any time. You or your child's decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with your child's high school, USF, or any other party.

- ✓ What We'll Do With Your Child's Responses: We plan to use the information from this study to inform educators and psychologists about the types of stressors faced by students in high school college preparatory programs, as well as strategies students tend to use to cope with stress. Responses will also be used to validate surveys of stress and coping specific to high-achieving students. The results of this study may be published. However, the data obtained from your child will be combined with data from other people in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.

- ✓ Questions? If you have any questions about this research study, please contact Dr. Suldo at (813) 974-2223 or Dr. Shaunessy at (813) 974-7007. If you have questions about your child's rights as a person who is taking part in a research study, you may contact a member of the Division of Research Integrity and Compliance of the University of South Florida at (813) 974-5638, and refer to eIRB # 1094.

- ✓ Want Your Child to Participate? To permit your child to participate in this study, complete the attached consent form and have your child turn it in to his or her designated teacher.

Sincerely,

Shannon Suldo, Ph.D.
Associate Professor of School Psychology
Department of Psychological and Social Foundations

Elizabeth Shaunessy, Ph.D.
Associate Professor of Gifted Education
Department of Special Education

Appendix D: Continued

Consent for Child to Take Part in this Research Study
I freely give my permission to let my child take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

_____	_____	_____
Signature of parent of child taking part in the study	Printed name of parent	Date

Printed name of child	Grade level of child	School
_____	_____	_____

Statement of Person Obtaining Informed Consent
I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

_____	_____	_____
Signature of person obtaining consent	Printed name of person obtaining consent	Date

Appendix E: Student Assent Letter

Dear Student:

Today you will be asked to take part in a research study titled, "Predictors of Academic Success among High School Students in College Preparatory Programs." You will be asked to complete several surveys that inquire about stressors that you experience and the things you do to deal with those stressors. Completing these surveys will take you approximately 45-60 minutes. Some students will be asked to retake a few of the same surveys in two weeks. To thank you for your participation, you will receive one pre-paid movie ticket for each time you are asked to complete these surveys.

You are being asked to participate in this study because you are a high school student in an either in an International Baccalaureate (IB) Program, and/or Advanced Placement (AP) classes. Your parent or guardian has already given you permission to take part in this study. Your answers will be kept confidential to the extent of the law. However, if you tell us that you plan to hurt yourself or someone else, we would have to tell someone at your school in order to keep everyone safe. You are free to withdraw from participating at any time, and you will not be penalized.

If you have any questions about the study, please feel free to contact Dr. Suldo at (813) 974-2223 or Dr. Shaunessy at (813) 974-7007.

Assent to Participate

I understand what participating in this study requires, and I agree to take part in this study.

_____	_____	_____
Signature of person taking part in the study	Printed name of person taking part in the study	Date

_____	_____	_____
Signature of person obtaining assent	Printed name of person obtaining assent	Date