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# Stress and Coping in High School Students in Accelerated Academic Curricula: Developmental Trends and Relationships with Student Success

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Stress and Coping in High School Students in Accelerated Academic Curricula:  
Developmental Trends and Relationships with Student Success

by

Brittany V. Hearon

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Education Specialist  
Department of Educational and Psychological Studies  
College of Education  
University of South Florida

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Keywords: high-achieving students, Advanced Placement, International Baccalaureate, high school, stress, coping

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## **Abstract**

High school students in accelerated academic curricula including Advanced Placement (AP) courses and International Baccalaureate (IB) programs are faced with unique challenges associated with their rigorous academic demands, in addition to normative adolescent stressors. Because of the increasing popularity of AP and IB among high-achieving youth and benefits realized by students who successfully manage such curricula, there remains a need to better understand the experiences of stress and coping among this population. The current study used longitudinal and cross-sectional comparisons to (a) investigate the degree to which students in accelerated curricula experience environmental stressors and employ coping strategies to manage academic stressors, and (b) determine which stressors and coping strategies were associated with student success. The longitudinal sample consisted of 184 students from six high schools within three school districts who completed the six-factor Student Rating of Environmental Stressors Scale (StRESS) and 16-factor Coping with Academic Demands Scale (CADS) at Time 1 (grades 9-11) and one year later, at Time 2 (grades 10-12). The cross-sectional sample included 2,379 students (grades 9-12) from 19 high schools within five school districts who also completed the StRESS, CADS, and the Students Life Satisfaction Scale (SLSS); grade point averages (GPAs) were gleaned from school records. Findings indicate that AP and IB students reported more frequent stressors specific to academic requirements over time, while older students (e.g., 11<sup>th</sup> and 12<sup>th</sup> grade) also reported experiencing more frequent stress due to academic and social struggles and financial issues than their younger counterparts. Regarding coping strategies, findings from longitudinal and cross-sectional comparisons suggested students tend to respond to

higher stress by increasing their use of maladaptive strategies including reliance on substance use, reduce effort on schoolwork, and deterioration. Predictive analyses indicated that environmental stressors explained 4-7% and 17-23% of the variance in academic achievement and life satisfaction, respectively. High-achieving students' stress due to academic requirements was related to greater academic success, while it did not appear to compromise life satisfaction. Moreover, while stress due to academic and social struggles was predictive of diminished life satisfaction, stress within this domain was not predictive of poorer academic outcomes. Coping strategies used to manage academic demands accounted for 13-20% and 23-32% of the variance in achievement and life satisfaction, respectively. Students who employed time and task management, sleep, and deterioration to cope were more likely to experience higher academic achievement, while those who coped by seeking academic support, skipping school, engaging in social and creative diversions, using substances, reducing effort on schoolwork, and handling problems alone were less likely to be academically successful. Additionally, those who used cognitive reappraisal, turning to family, and social and athletic diversions were more likely to experience high life satisfaction, while those relying on creative diversions, reduce effort on schoolwork, handle problems alone, and deterioration were less likely to have high life satisfaction. Implications of findings for key stakeholders, including schools psychologists, and future directions for research are discussed.

## Chapter I: Introduction

### Statement of the Problem

Adolescence is a turbulent stage of development characterized by a number of intrapersonal changes in terms of cognitive, emotional and physical development, and interpersonal changes such as negotiating relationships with peers and family, and adapting to school transitions (Arnett, 1999; Frydenberg, 2008). Although researchers have recently questioned the extent to which adolescence is an inevitable period of “storm and stress” or a *relatively* smooth transitional phase to adulthood (Hollenstein & Lougheed, 2013), there is agreement that adolescents are confronted with a number of changes that can cause heightened distress. It is critical to understand the challenges adolescents face, as stressful life experiences pose a threat to healthy physiological development and psychological well-being. Furthermore, more frequent exposure to stressful life events or to more severe environmental stressors is predictive of the development of more severe symptoms of psychopathology (Grant et al., 2003; McMahon et al., 2003).

The extent to which adolescents’ environmental stressors result in detrimental outcomes is partly influenced by their access to productive coping strategies that result in diminished symptoms of distress (Frydenberg, 2008; Nicolai, Laney, & Mezulis, 2013). Coping strategies developed during this period place youth on more versus less adaptive developmental trajectories, in addition to serving as a precursor of coping patterns used throughout adulthood (Compas et al., 2001). The identification of functional and dysfunctional adolescent coping strategies may facilitate the prevention and intervention of mental health concerns in youth, as

coping contributes to the extent to which psychopathological symptoms develop from stress. Although coping strategies have traditionally been categorized dichotomously as problem-focused versus emotion-focused, approach versus avoidance, or primary versus secondary control, researchers such as Compas and colleagues (2001) have asserted that such categorizations do not adequately reflect the structure of coping in young people. Rather, multidimensional models that include multiple categories such as active coping, seeking social support, distraction, and avoidance may be better suited to describe adolescents' coping behaviors (Ayers, Sandler, West, & Roosa, 1996). Because the degree to which adolescents successfully cope with stress has meaningful implications for their adaptation, health, and development, it is essential to understand both sources of stress and coping strategies adopted for handling them.

Despite increasing enrollment in accelerated high school curricula including Advanced Placement (AP) courses and International Baccalaureate (IB) programs, research on the stressors and coping strategies common to students in these programs remains scant. High-achieving youth enrolled in accelerated high school curricula are faced with unique challenges including rigorous academic demands (e.g., end-of-course standardized exams) and preparation for college (e.g., high-stakes entrance exams, pressure to excel academically), in addition to normative adolescent challenges. Researchers have demonstrated that students enrolled in AP courses and IB programs perceive significantly higher levels of stress than their general education peers (Suldo, Shaunessy, & Hardesty, 2008; Suldo, Shaunessy-Dedrick, 2013a). Investigations with qualitative components have found that students' heightened stress is chiefly caused by academic requirements including an excessive workload, maintenance of high grades, memorization of course content for end-of-year exams, and IB Diploma requirements such as the Extended Essay

(Hertberg-Davis & Callahan, 2008; Taylor & Porath, 2006; Vanderbrook, 2006). To manage augmented levels of stress related to academic demands, high-achieving students frequently rely on coping strategies that include problem-solving (e.g., time and task management), task avoidance (e.g., engaging in a different activity to get mind off of stressor), and trying to handle problems alone (Suldo, Dedrick, Shaunessy-Dedrick, Fefer, & Ferron, in press; Suldo, Shaunessy, & Michalowski, 2008). It is necessary to explore the extent to which high-achieving students employ different types of coping strategies in response to their intense academic demands, as research has demonstrated that students' use of specific coping behaviors has meaningful associations with academic and mental health outcomes (Suldo, Shaunessy, & Hardesty, 2008).

Previous investigations indicate that the events and circumstances that generate stress vary throughout the course of adolescent development. While younger adolescents experience heightened stress due to interpersonal conflicts with family and friends (Nieder & Seiffge-Krenke, 2001), older adolescents are more often challenged by stress related to high expectations for academic achievement, as well as college and career goals (Code, Bernes, Gunn, & Bardick, 2006). Similarly, the coping strategies adopted by youth may change throughout adolescence due to improved metacognitive functioning and emotional maturity (Seiffge-Krenke, 1993; Skinner & Zimmer-Gembeck, 2007). For example, social support seeking strategies remain stable throughout adolescence, while problem-focused strategies tend to increase and avoidant strategies decrease (Amirkhan & Auyeung, 2007). The extent to which these changes are experienced by high-achieving youth in rigorous high school curricula has not yet been explored.

Suldo and Shaunessy-Dedrick (2013b) recently reported that students entering an IB program experience a larger increase in *perceived stress* associated with their curriculum as

compared to the change in stress reported by their counterparts who enter general education. However, the frequency with which *environmental stressors* are encountered year-over-year throughout high school has not yet been investigated. Moreover, the changes in coping strategies high-achieving students use to manage stressors related to their academic demands throughout high school remain unknown.

### **Purpose of the Current Study**

The purpose of the current study was to contribute to the literature on the environmental stressors encountered by high-achieving youth enrolled in rigorous high school curricula—AP and IB—and the corresponding coping strategies such students use to reduce stress associated with their academic demands. A comprehensive review of databases of educational and psychological studies revealed no published longitudinal investigations of the changes in environmental stressors and/or accompanying coping strategies in a sample of students in accelerated high school curricula. Additionally, the literature does not include cross-sectional studies of the environmental stressors experienced by, and coping strategies used by, AP and IB students enrolled in different grade levels. Because of the increasing popularity of rigorous high school curricula, as well as the academic, economic, and social-emotional benefits realized by students who successfully complete such curricula (Bleske-Rechek, Lubinski, & Benbow, 2004; Dougherty, Mellor, & Jian, 2006; Murphy & Dodd, 2009), it is critical to identify and address the social-emotional challenges associated with enrollment, specifically with regard to environmental stressors experienced and coping strategies used to manage academic stressors.

Given the paucity of research on stress and coping of AP-IB youth, the current study examined developmental trends in stressors and coping strategies used by high school students within accelerated academic programs. The findings shed light on the specific types of

environmental stressors students most frequently encounter while enrolled in a given grade level of their accelerated academic programs, which may be used to inform schools' implementation of targeted prevention and intervention efforts that match students' needs. Additionally, the findings regarding coping strategies students differentially rely on during each grade level delineate the stability of diverse coping behaviors throughout high school, which can inform efforts to target the developmental levels during which students need support to acquire more sophisticated coping strategies with the goal of managing stress generated by academic demands. Finally, finding from analyses investigating the extent to which environmental stressors and academic coping strategies predict students' success can inform efforts to limit students' exposure to environmental stressors that result in lower academic achievement and life satisfaction, as well as equip students with the academic coping strategies that may result in higher academic achievement and greater life satisfaction.

### **Definition of Key Terms**

**Stress.** Stress in the current study is defined in alignment with the *environmental model*, which views stress as independent environmental events or chronic conditions that threaten adolescents' physical and/or psychological well-being (Grant et al., 2003).

**Coping.** Coping refers to the cognitive and behavior efforts that an individual exerts to manage a specific internal or external demand that exceeds that individual's resources (Lazarus & Folkman, 1984).

**High-achieving.** In the current study, high-achieving refers to the type of student enrolled in accelerated high school curricula, including Advanced Placement (AP) courses and International Baccalaureate (IB) programs. To enroll in these rigorous curricula, students often must complete entry requirements (e.g., take prerequisite courses such as Algebra I and Foreign



Language in high school, earn minimum scores on state performance tests), and maintain high grade-point averages to demonstrate their academic skills and talents.

**Academic achievement.** Academic achievement refers to the extent to which students achieve their educational goals in school. In the current study, the primary indicator of students' academic achievement is unweighted high school grade point average (GPA) for the current semester at the time of the second wave of data collection (Spring 2012).

**Life satisfaction.** Life satisfaction is increasingly examined as a positive indicator of mental health, and has been defined as one's subjective appraisal of his/her quality of life overall, or with regard to specific domains (e.g., friends, self, school; Diener, Suh, Lucas, & Smith, 1999). In the current study, life satisfaction refers to an individual's global cognitive evaluation of his/her life as a whole (Shin & Johnson, 1978). Life satisfaction is one of three core components of subjective well-being, which is often referred to as a scientific term for happiness (Diener, 2000).

**Student success.** In the current study, student success refers to positive outcomes in the academic and psychological domains, specifically high academic achievement as well as high life satisfaction. High academic achievement is defined as obtaining an unweighted GPA of 3.0 or higher, in accordance with accelerated academic program (i.e., AP and IB) criteria, while high life satisfaction is defined as obtaining a 4.0 or higher on the Students' Life Satisfaction Scale (SLSS; Huebner, 1991), consistent with prior research (Suldo & Huebner, 2004).

## **Research Questions**

The current study answered the following research questions:

1. To what extent, if any, do high-achieving high school students' environmental stressors change between Time 1 and one year later, at Time 2?

2. To what extent, if any, do high-achieving high school students' strategies for coping with academic demands change between Time 1 and one year later, at Time 2?
3. Do environmental stressors experienced by high-achieving high school students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?
4. Do strategies for coping with academic demands used by high-achieving high school students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?
5. To what extent do high-achieving high school students' environmental stressors predict their success in terms of:
  - a. Academic achievement
  - b. Life satisfaction?
6. To what extent do high-achieving high school students' strategies for coping with academic demands predict their success in terms of:
  - a. Academic achievement
  - b. Life satisfaction?

## **Hypotheses**

Although this study was exploratory in nature, the following tentative hypotheses were developed in accordance with previous developmental trends in stress and coping research identified within samples of general youth.

**Research question 1.** It was hypothesized that high-achieving high school students' environmental stressors would differ significantly between Time 1 (grade 9, 10, or 11) and one year later, at Time 2 (grade 10, 11, or 12). Specifically, it was hypothesized that students would experience higher levels of stressors related to academic requirements and lower levels of stressors related to parent-child conflict and academic and social struggles at Time 2, in line with

previous research findings that younger adolescents experience greater relationship stressors (Laursen, Coy, & Collins, 1998; Nieder & Seiffge-Krenke, 2001) and older adolescents experience greater stress related to academic performance (Lee, Puig, Lea, & Lee, 2013). The prior research that informed this and subsequent hypotheses is reviewed in detail in chapter 2.

**Research question 2.** It was hypothesized that high-achieving high school students' coping strategies used to manage academic demands would differ significantly between Time 1 (grade 9, 10, or 11) and one year later, at Time 2 (grade 10, 11, or 12). Particularly, it was hypothesized that students would rely more frequently on strategies often conceptualized as productive (e.g., cognitive reappraisal, seek academic support, turn to family) or independent (i.e., handle problems alone), or talk to friends and classmates (Amirkhan & Auyeung, 2007; Frydenberg & Lewis, 2000), and less often use strategies conceptualized as avoidant including skipping school and reducing effort on schoolwork at Time 2 (Amirkhan & Auyeung, 2007; Zimmer-Gembeck & Skinner, 2011).

**Research question 3.** It was hypothesized that mean levels of categories of environmental stressors would differ significantly for high-achieving high school students across 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grades. Specifically, it was hypothesized that students would display an increasing trend in stress related to academic requirements and decreasing trend in stress related to parent-child conflict and academic and social struggles, in line with previous literature suggesting that younger adolescents experience greater relationship stressors (Laursen, Coy, & Collins, 1998; Nieder & Seiffge-Krenke, 2001) and older adolescents experience heightened stress related to academic performance (Lee et al., 2013).

**Research question 4.** It was hypothesized that coping strategies used to manage academic demands would differ significantly for high achieving students across 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>,

and 12<sup>th</sup> grades. Particularly, it was hypothesized that students would display an increasing trend in cognitive reappraisal, seek academic support, turn to family, handle problems alone, and talk to friends and classmates, and a decreasing trend in skipping school and reducing effort on schoolwork. These hypotheses were in accordance with previous research literature suggesting that older adolescents more often rely on problem-oriented strategies and less frequently rely on avoidant strategies (Amirkhan & Auyeung, 2007; Zimmer-Gembeck & Skinner, 2011).

**Research question 5.** It was hypothesized that environmental stressors would explain a large, statistically significant amount of variance in students' academic achievement (i.e., GPA) as well as their life satisfaction. Consistent with prior research investigating the relationship between stress and achievement, it was expected that students with higher levels of stress across domains investigated (e.g., academic requirements, parent-child conflict) would have lower academic achievement (Cunningham, Hurley, Foney, & Hayes, 2002; Schraml, Perski, Grossi, & Makower, 2012). Additionally, in accordance with literature on stress and life satisfaction, it was hypothesized that students with higher levels of stress across domains examined would have lower life satisfaction (Abolghasemi & Varaniyab, 2010).

**Research question 6.** It was hypothesized that academic coping strategies would explain a large, statistically significant amount of variance in students' academic achievement (i.e., GPA), in addition to their life satisfaction. Congruent with previous research investigating the relationship between coping strategies and achievement in high-achieving youth, it was expected that students who employed strategies that are adaptive in nature, including cognitive reappraisal and active problem-solving (e.g., time and task management, seek academic support), would have higher academic achievement (Reis, Colbert, & Hebert, 2005). Furthermore, in line with literature on coping strategies and life satisfaction in high-achieving youth, it was expected that

students who used coping strategies more maladaptive in nature, such as substance use and anger/obsessive thoughts, would have lower life satisfaction (Suldo, Shaunessy, & Hardesty, 2008).

### **Study Contributions to School Psychology Practice**

School psychologists should be concerned with the environmental stressors faced by high-achieving students enrolled in accelerated high school curricula, as research has demonstrated that the accumulation of stressful life occurrences serves as a pervasive risk factor for the development of psychopathology (Grant et al., 2003). Moreover, students enrolled in rigorous high school curricula report higher levels of stress than their general education peers (Suldo, Shaunessy, & Hardesty, 2008) due to extensive academic demands (Suldo et al., 2009), indicating these students may be particularly vulnerable to mental health concerns. By identifying the environmental stressors students in accelerated high school curricula experience within a given grade level, the results of this study can inform the targeted prevention and intervention efforts made by school psychologists, as well as other key stakeholders. Furthermore, the extent to which students are negatively impacted by stressful life events is partly influenced by their use of productive coping strategies (Frydenberg, 2008; Nicolai, Laney, & Mezulis, 2013). By ascertaining high-achieving students' differential reliance on coping strategies throughout high school, this study aimed to further facilitate school psychologists' targets for prevention and intervention effort with regard to which students may be most in need of direct instruction regarding effective coping strategies to manage academic demands.

### **Study Contributions to the Literature**

The current study contributes to the extant literature on the social-emotional functioning of high-achieving students enrolled in rigorous academic curricula including IB programs and

AP courses. To date, there are no published longitudinal investigations of the changes in stressors and supplemental coping strategies in a sample of high-achieving students enrolled in rigorous high school curricula. Additionally, cross-sectional studies of the differences in the environmental stressors experienced by, and coping strategies used by, high-achieving high school students remain absent from the literature. This study thus intended to provide a unique contribution by delineating changes in students' stressors and academic coping strategies over time, as well as identifying the differences in stressors and coping strategies of students across grade levels. Finally, this study aimed to provide the literature with a more comprehensive picture of the relationship between high-achieving high school students' academic stressors, as well as coping strategies to manage academic demands, and their successful outcomes in terms of academic achievement and life satisfaction.

## **Chapter II: Review of the Literature**

Adolescence is a tumultuous stage of development marked by a number of changes, including cognitive, social, emotional, and physical changes resulting in maturation (Arnett, 1999). Although this transitional phase is inevitable, the speed and magnitude of changes encountered place adolescents at greater risk for elevated levels of stress, which may overtax their ability to cope (Byrne, Davenport, & Mazanov, 2007). Adolescents encounter a multitude of environmental stressors including pressure to achieve academic success, conflict with parents and peers, transitions to new schools, romantic relationship frustrations, and major life events (e.g., parents' divorce, death of a family member). The accumulation of stressful life experiences serves as a significant and pervasive risk factor for the development of adolescent psychopathology (Grant, Compas, Thurm, McMahon, & Gipson, 2004). Moreover, the regulatory coping behaviors which adolescents engage in to manage their stress partly affects the degree to which they are adversely impacted. Because the degree to which adolescents cope with stress has meaningful implications for their adaptation, health, and development, it is essential to understand both sources of stress and coping strategies adopted for handling them.

For high-achieving students enrolled in rigorous high school curricula, such as Advanced Placement courses and the International Baccalaureate program, the amount of environmental stress experienced may be even greater due to extensive academic requirements (Suldo, Shaunessy, & Hardesty, 2008). Additionally, these students have been shown to use unique coping strategies to effectively manage their stressful life occurrences (Suldo, Shaunessy, Michalowski, & Shaffer, 2008). This chapter reviews the literature on high-achieving students,

normative adolescent stressors and coping strategies, high-achieving students' unique stressors and coping strategies, and changes in patterns of adolescent stressors and coping strategies over time.

### **High-Achieving Students and their Curricular Options**

Students who may pursue particularly rigorous high school coursework include those identified as intellectually or academically gifted and talented. Although the federal definition describes gifted individuals as those who “give evidence of higher performance capability in such areas as intellectual, creative, artistic, or in specific academic fields, *and* who need services or activities not ordinarily provided by the school in order to fully develop those capabilities,” states vary greatly in their conceptualization of giftedness and provision of related educational services (NAGC, 2014). Gifted programming has existed primarily in elementary and some middle schools, while high schools most often rely on accelerated, college-level curricula to meet the needs of their advanced learners (Hertberg-Davis, Callahan, & Kyburg, 2006). Among such accelerated curricular options offered to gifted high school learners are Advanced Placement (AP) courses and the International Baccalaureate (IB) program. Although both were developed outside the realm of gifted education, gifted secondary learners have embraced AP and IB, reporting that their coursework provides a more appropriate level of challenge than other high school courses (Hertberg-Davis & Callahan, 2008). Although the one-size-fits-all approach offered by many AP and IB courses has been discussed as inadequate for meeting the needs of all gifted learners, researchers acknowledge that programs are often the best options available to gifted and talented high school youth (Gallagher, 2009; Hertberg-Davis & Callahan, 2008).

In recent years, the prevalence of academically rigorous curricula, including the IB program and AP courses, has increased in American high schools. An investigation of students



enrolled in dual credit and exam-based courses in U.S. schools reported that 69% of public high schools offer AP or IB courses (Thomas, Marken, Gray, & Lewis, 2013). Such an expansion has largely been driven by the enrollment of high-achieving students, including those identified as intellectually or academically gifted, who seek out opportunities to explore advanced concepts, while reaping other long-term benefits from program participation (Iatarola, Conger, & Long, 2011). Regarding such benefits, research suggests that students with AP or IB course participation report greater satisfaction with the caliber of their high school education (Bleske-Rechek, Lubinski, & Benbow, 2004), feel better prepared for college (Taylor & Porath, 2006), have higher SAT scores (McKillip & Rawls, 2013), have higher college GPAs (Murphy & Dodd, 2009), and graduate at higher rates (Shah, Dean, & Chen, 2010). Additionally, many colleges offer course credit for AP and IB exams, thus lowering students' total college tuition cost and time to degree completion (Dougherty, Mellor, & Jian, 2006). Waits and colleagues' (2005) investigation of dual-credit and exam-based courses in U.S. public high schools revealed that schools with the highest minority populations were the least likely to offer exam-based AP and IB courses. State legislatures and the College Board have thus collaborated to decrease this disparity by establishing more programs in urban cities to increase minority student enrollment over the past decade.

**Advanced Placement (AP).** AP courses originated in 1956 and were designed for the purpose of offering accelerated curriculum to high schools students, so that they were better prepared for college (College Board, 2003). Although AP courses were initially offered at just 104 schools, as of 2011, the program has expanded to more than 17,000 public and private high schools nationwide. This extension has greatly increased student access to more rigorous, college-level classes prior to university enrollment. There are currently 36 AP courses high

schools may offer their students, which span across a broad range of academic content areas (e.g., Human Geography, Calculus; College Board, 2014). According to College Board policy, AP courses are designed to provide challenging, college-level coursework and are thus best positioned as part of student's 11<sup>th</sup> and 12<sup>th</sup> grade curriculum; however, certain subject areas (i.e., World History, European History), can be successfully offered to academically advanced 10<sup>th</sup> graders (College Board, 2010). Traditionally, schools offering AP classes have allowed students to select the classes in which they wish to enroll cafeteria-style; however, other schools have developed a specific number and sequence of AP classes, a program of study to which students must adhere.

After students complete their AP coursework, they may take an end of the year exam in May and earn college credit contingent on their performance. Over 90% of four-year colleges and universities in the United States grant students credit, placement, or both, based on their AP exam performance (Hart, Carman, Luisier, & Vasavada, 2011). Of note, the College Board allows students to complete the AP exam at the end of the year regardless of AP course completion. High-achieving students may select to take AP courses rather than enrolling in an IB program in order to have greater flexibility in the number of rigorous classes they take, in addition to the subject matter of their high school curricula.

**International Baccalaureate (IB).** The IB Diploma Program was created in the 1960s to provide high school juniors and seniors with skills that would allow them to become critical, knowledgeable, compassionate, and lifelong learners so they may create a more peaceful, tolerant world (IBO, 2013a). To fulfill this mission, the IB program has developed a comprehensive, internationally recognized curricular program that emphasizes students' cultivation of metacognitive thinking, cultural competence, and community service. Although

the IB Diploma Program is only offered to students in 11<sup>th</sup> and 12<sup>th</sup> grade, many IB Diploma-granting high schools offer a set Pre-IB curriculum to students in grades 9 and 10 (Suldo, Shaunessy, & Hardesty, 2008), or offer the Middle Years Program (MYP) through 10<sup>th</sup> grade or age 16 (IBO, 2014a).

The academically challenging and IB Diploma Program requires students to complete (a) an in-depth research project (extended essay), (b) a course designed to enhance critical thinking skills (theory of knowledge), (c) a range of activities related to the arts, physical activity, and community service (creativity, action, service), and (d) one course from each of five mandatory subject areas (IBO, 2013b). Students who complete these requirements and pass the end-of-course exams are awarded the prestigious IB Diploma. As of 2014, the IB Diploma Program was offered at over 2,400 schools worldwide, and 800 in the United States (IBO, 2014b). Although AP courses are offered in all 50 states, the IB programs are popular in some states (e.g., New York, Florida) and absent in others (e.g., North Dakota, South Dakota).

Because of the continuously increasing enrollment of high-achieving students in accelerated high school curricula, it is essential to consider the impact of such course demands on students' social and emotional functioning. While the challenging coursework provided by AP and IB offers numerous long-term benefits, the associated requirements for successful completion may pose a threat to students' well-being by way of increased number of academic demands or heightened levels of stress.

### **Theoretical Conceptualizations of Stress**

Stress is a frequently used term, often used to describe an individual's internal state, an external event, or the complex interaction between a person and his or her environment.

Although all individuals experience some degree of stress throughout their lifespan, the stimuli

that provoke stress and corresponding emotional, biological, or behavioral responses that occur are not universal. Stress responses are in part determined by an individual's perception of the threat a stimulus poses to his or her well-being. Because stress is not an isolated element, rather a process, it is critical to consider the various components that contribute to its development. Three distinct theoretical frameworks have been used in conceptualizations of stress: the medical, environmental, and psychological models (McNamara, 2000).

**Medical model.** The medical model defines stress as the physiological response of the body to an aversive physical, biological, or psychological agent. Originating from the work of Hans Selye (1956), stress was first described as the “non-specific neuroendocrine response of the body,” then later altered to include the entire physiological reaction as the body’s “general response to any demand placed upon it” (Szabo, Tache, & Somogyi, 2012). Selye (1951) proposed that this response was independent of the nature of the stressor and followed a pattern of interrelated adaptive reactions termed the “General Adaptation Syndrome.” The integrated syndrome consists of three stages: alarm reaction, resistance, and exhaustion. In the alarm reaction stage, adaptation has not yet been acquired and thus the body produces stress hormones including cortisol, adrenaline, and noradrenalin when faced with a stressor in preparation of a flight or fight response. Adaptation is optimal in the resistance phase that follows, as homeostasis begins to restore balance in hormone levels and the source of stress has potentially been resolved (Selye, 1951). Finally, in the event that the stressful condition persists, the body enters the exhaustion stage and the acquired adaptation is lost again. Although the medical model of stress has been criticized because it assumes that all stressors evoke the same response pattern of adaptation in all individuals, the body’s physiological response remains a common way of investigating human stress (Evans et al., 2013). This holds true for all phases of the

lifespan, including adolescence, as researchers continue to investigate adolescents' stress physiology in response to common daily activities (e.g., computer activities, chores, sports, school/homework; McHale et al., 2012), family conflict (Spies, Margolin, Susman, & Gordis, 2011), hormonal shifts during puberty (Romeo, 2013), and gender-specific psychosocial stressors (Ordaz & Luna, 2012).

**Environmental model.** The environmental model identifies stress as an independent factor that arises from characteristics of disturbing or threatening environments (McNamara, 2000). Environmental perspectives highlight the importance of objectively documenting stressful life occurrences and conditions independent of potentially confounding personal psychological appraisals (Cohen, Kessler, & Gordon, 1995). Stress within this framework is determined by the demand placed on the individual and corresponding degree of strain that may be tolerated whilst still allowing him or her to achieve homeostasis. Such demands may occur in the form of a change within a social environment or fixed environmental conditions that present ongoing challenges. If the individual is subjected to chronic or repeated environmental stressors over time, he or she will experience a higher allostatic load (i.e., physiological wear and tear), which may ultimately lead to dysfunctions of biological and psychological systems (Compas & Andreotti, 2013). The environmental model is favorable for instrumentation of stress measurement, which is often in the form of respondent-based checklists of adverse life occurrences (Williamson et al., 2003). Moreover, previous research investigations have highlighted the importance of determining the impact of exposure to environmental stressors on the development of total internalizing and externalizing psychopathology, as well as symptoms of anxiety, depression, eating disorders, aggressive behavior disorders, conduct problems, and substance abuse (McMahon, Grant, Compas, Thurm, & Ey, 2003; Grant et al., 2003)

**Psychological model.** The psychological model is the most widely embraced theoretical conceptualization of stress (Compas & Andreotti, 2013). Within this framework, stress is described as the interactive relationship between the stressful events an individual encounters, and his or her subsequent cognitive appraisal and physiological response. Richard Lazarus (1966) first introduced the psychological conceptualization of stress, which he later defined as the “particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (Lazarus & Folkman, 1984). According to this transactional approach, stress appraisal begins with an evaluation of the situation as a threat, and later follows with consideration of access to coping strategies (McNamara, 2000). Proponents of this theory have argued the importance of understanding the role psychological processes play in determining the way stressful events affect our emotions, physical health, and behavior, while adversaries have demonstrated that heightened stress during infancy, with the absence of complex cognitive appraisals, has adverse effects later in childhood (Pollack et al., 2010). Measuring cognitive stress appraisal is challenged by the substantial variation that occurs throughout development; the effects of stress often manifest independent of appraisal throughout childhood and early adolescence (Grant et al., 2003). One often used index is self-report on the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983), which asks respondents to indicate the frequency of their personal experiences with issues such as “found that you could not cope with all the things that you had to do” or “felt nervous and stressed?” Using such measures of global stress appraisals, researchers continue to investigate the impact of transactional stress theory on outcomes including the development of adolescent psychopathology in the form of anxiety (Hickle & Anthony, 2013) and depression (Hankin & Abramson, 2001).

## **Theoretical Conceptualization of Stress in the Current Study**

Stress in the current study is defined in alignment with the environmental model, which views stress as independent environmental events or chronic conditions that threaten adolescents' physical and/or psychological well-being (Grant et al., 2003). This description is consistent with the traditional stimulus-based definitions of stress, which posit that events and chronic circumstances may threaten an individual without leading to negative outcomes and hence allowing for resilience (Compas & Andreotti, 2013). Moreover, this definition will provide for a relatively objective documentation of stressful life events and conditions independent of varying individual cognitive appraisals, thus eliminating potential confounds as valued in stress research (Grant et al., 2003). Grant and colleagues advocate for measuring stress in terms of an accumulation of environmental stressors, without attempting to disentangle the *events* from one's *appraisals* of the events, or their *physiological reactions* to the events.

## **Environmental Stressors during Adolescence**

Adolescence is a particularly turbulent developmental phase, characterized by numerous changes. Specifically, adolescents experience intrapersonal changes in terms of cognitive, emotional and physical development, and interpersonal changes such as negotiating relationships with peers and family, and adapting to school transitions (Frydenberg, 2008). Although most adolescents take pleasure in many aspects of their lives, are satisfied with their relationships, and are hopeful about the future (Offer & Schonert-Reichl, 1992), others who struggle to adapt may experience heightened distress or psychopathology (Grant et al., 2003). Previous research investigations have attempted to highlight specific stressors encountered in the developmental context of adolescence, so as to identify potential factors to be targeted for intervention (McNamara, 2000). In a large survey of adolescents, Frydenberg (1997) found that students'

stressors span across a range of issues including appearance, school grades, employment, relationships, personal health, self-esteem, parents' health, dating and sexual relationships, and future educational and vocational plans. Frydenberg (2008) posits that this variety of stress domains can be categorized into three broad categories: achievement/academic (e.g., succeeding in school, finding employment), relationships (e.g., family and peers), and social issues (e.g., community violence, poverty).

**Academic stressors.** Academic stress has been defined as the environmental demands and difficulties students encounter within an academic setting that “tax, challenge, or exceed students’ coping resources [...]” (Ben-Zur & Zeidner, 2012, p. 713). These academic demands may consist of specific stressors including testing and grades, and the student’s present and future performance expectations and goals (de Anda et al., 2000; Elkind, 1981; Kouzma & Kennedy, 2004). The impact of academic stressors on the lives of youth has been identified as particularly salient. Several empirical investigations have found that pressures and expectations within the school environment are paramount among adolescents’ reported sources of daily life stress (Armacost, 1989; de Anda et al., 2000; Stark, Spirito, Williams, & Gueveremont, 1989). The degree of stress experienced within the academic environment is influenced by a wide variety of factors including objective properties of achievement (e.g., academic excellence standards, course difficulty level), the student’s perception of the academic environment (e.g., perceived social support from teacher and peers, perceived level of academic competition), coping resources (e.g., cognitive strategies, emotional support from others), and the cultural lens through which the environmental demands are experienced (Ben-Zur & Zeidner, 2012). With the increased academic pressure high school students face including classes with more demanding workloads and higher expectations for academic performance to ensure college



acceptance, students are at risk for development of a host of negative outcomes associated with increased stress, including psychosomatic illness, substance abuse, delinquent behavior, juvenile crime, and suicide (Kouzma & Kennedy, 2004).

Case in point, Kouzma and Kennedy (2004) examined the main sources of students' self-reported stress among a sample of 423 Australian high school seniors from seven large high schools in Victoria. The researchers hypothesized that school-related issues would be rated as the highest sources of stress. Students completed the 34-item Academic Stress Questionnaire (ASQ; Abouserie, 1994), rating their amount of stress experienced during the past academic school year using a five-point scale, anchored at 0 (*No stress*) and 4 (*Extreme stress*). As expected, the seniors' major sources of stress were school-related. Specifically, students were most stressed about their examinations and results, school course workload, future academic/professional endeavors, amount of material they were required to learn, and the need to perform well imposed by parents, teachers, and themselves. Results from this study suggest that students experience a number of school-related stressors and hence may benefit from stress-management techniques to ameliorate potentially overwhelming problems within the academic environment.

**Family relationship stressors.** Numerous empirical research investigations have documented the pervasive influence of family relationships on adolescent psychological and physical development (McNamara, 2000; Seiffge-Krenke, 2011). Family stressors have been found to exert a particularly strong negative impact on adolescent health, with long-term detrimental effects surpassing those of either school or peer-related stressors (McNamara, 2000). One of the ways in which family relationships may affect developmental outcomes is through the stressful experience of witnessing and/or participating in poor-quality relationships (Lucas-Thompson & Goldberg, 2011). During adolescence, the intensity and frequency of parent-child

conflict increases and parent-child interactions are often marked by negative emotionality (Marceau, Dorn, & Susman, 2012). Hostile interactions during this developmental phase often result in a cyclical process whereby poor parent-child relationship quality leads to negative emotionality, which then generates further deterioration in the parent-child relationship quality. Parent-child conflicts may arise over a variety of issues including chores, peer relationships, romantic relationships, activities, schoolwork completion, academic performance, bedtime, curfews, and appearance. Although arguments may arise from trivial issues, minor disagreements can be stressful for both adolescents and parents, and may escalate into more serious conflicts (McNamara, 2000). Moreover, adolescents who engage in family relationships marked by high conflict and low emotional support are more likely to have difficulty regulating their emotional and physiological responses to stressors (Repetti, Taylor, & Seeman, 2002).

**Peer relationship stressors.** An adolescent's friendship network plays a key role in both the sources of stress experienced and the outcomes of stressful life events. Although affiliation with non-deviant peers has been found to serve as a protective factor when faced with sources of stress (Fergusson & Lynskey, 1996), it is evident that peer relations can also generate stress in the lives of youth (Grant et al., 2006). Members of cliques developed in adolescence have the tendency to solicit negative feedback among their friends, which contributes to elevations in depressive symptoms and perceived criticism from best friends among girls, and peer rejection in boys (Borelli & Prinstein, 2006). Previous research investigations have linked negative self-views and psychological distress to problems with peer relationships including social withdrawal (Rubin & Mills, 1988), loneliness (Asher & Paquette, 2003; Cillessen & Bellemore, 1999), peer rejection (Beeri & Lev-Wiesel, 2012), victimization (Rigby, 2000), and lack of reciprocal friendships. Moreover, Caldwell and colleagues (2004) found that when adolescents

experienced adversity in peer relationships, they adopted negative self-views and remained disengaged from their peers six months later. Adolescents who extensively discuss and self-disclose emotional problems with others through co-rumination with their peers may also experience heightened distress leading to earlier onset of depression (Stone, Hankin, Gibb, & Abela, 2011). Pressure from peers may also contribute to increased stress (Byrne, Davenport, & Mazanov, 2007), as adolescents may be faced with the decision to partake in deviant behavior or become ostracized by their peers. Insecure attachments to peers can be characterized by mistrust, poor communication, emotional detachment, and alienation. Individuals experiencing poor peer attachment have lower self-reported well-being with regard to self-esteem and life satisfaction (Armsden & Greenberg, 1987). Generally females place greater emphasis on the maintenance of their harmonious relations and demonstrate greater concern with the evaluation of their peers (Cross & Madson, 1997; Stroud, Salovey, & Epel, 2002), suggesting they may also experience greater distress from relationships and corresponding insecure attachments.

**Major life events.** In addition to experiencing daily life stressors, some adolescents also face non-normative major life events that often require long-term adaptation. Such critical events are often outside of an adolescent's control and may be linked to greater social concerns (e.g., poverty, community violence). For example, a government's economic downfall may result in a parent's unemployment; a major life event that is likely to produce heightened stress for all family members. Other stressful life events may include parents' divorce, death of a family member or friend, moving to a new home, serious illness or injury of a friend, and experiencing a dangerous attack at home or on the street. Well-established inventories including the Adolescent Perceived Events Scale (APES; Compas, Davis, Forsythe, & Wagner, 1987) incorporate items distinguished as major life events or daily hassles so as to provide a more

comprehensive measurement of adolescent stress. Other measures, such as the Life Events Checklist (LEC; Johnson & McCutcheon, 1980), have been used in research aimed specifically at measuring stress generated by acute life events (e.g., changing to a new school, serious illness or injury of a family member). Tiet and colleagues (2001) examined the relationship between adverse life events and psychiatric illness in 1,285 youth ages 9 to 17 and found that critical life events (assessed using a modified version of the Life Events Checklist) were significantly associated with psychiatric disorders. Of the negative life events provided, adolescents most frequently endorsed “someone in the family died,” “family member was seriously ill/injured,” and “saw crime/accident,” suggesting these are more pervasive stressors among youth. Experiencing loss or grief (e.g., death of a family member or friend) was associated with depressive disorders (i.e., major depressive disorder and dysthymia), and being a victim of crime, violence, or assault was related to disruptive disorders (i.e., oppositional defiance disorder and conduct disorder). McKnight, Huebner, and Suldo (2002) explored relationships among stressful life events, temperament, internalizing and externalizing behaviors, and global life satisfaction among 1,201 adolescents (ages 11 to 18). Adolescents who indicated a greater frequency of stressful life events experienced lower levels of life satisfaction, and increased symptoms of both internalizing and externalizing behaviors. Such findings demonstrate that adolescents who encounter adverse life events above and beyond daily life challenges may be particularly vulnerable to engaging in maladaptive behaviors.

**Stressors of high-achieving youth.** High-achieving students enrolled in accelerated high school curricula are faced with challenges including rigorous academic demands (e.g., end-of-course standardized exams, extended essay research project) and preparation for college (e.g., high-stake entrance exams, pressure excel academically), in addition to normative adolescent

stressors including parent and peer conflicts, biological changes, and daily hassles. Perhaps because of these additional academic demands, high school students in an IB program report significantly higher levels of perceived stress than their general education counterparts (Suldo, Shaunessy, & Hardesty, 2008). Subsequent study revealed that IB students' heightened stress can indeed be attributed more to the completion of academic requirements, rather than family and peer relationships or major life events (Suldo, Shaunessy, Thalji, Michalowski, & Shaffer, 2009). In a recently published study of high-achieving students enrolled in rigorous high school curricula, Suldo and Shaunessy-Dedrick (2013a) found that students enrolled in AP classes or an IB program reported higher levels of stress than their general education peers, while maintaining exceptionally high academic performance. Additionally, higher levels of stress in AP and IB students did not co-occur with deleterious outcomes, as students maintained psychological functioning that was commensurate with their general education peers, as well as held strong perceptions of school climate (Suldo & Shuanessy-Dedrick, 2013a). These results were commensurate with previous findings in which IB and general education students reported comparable levels of global life satisfaction and internalizing symptoms of psychopathology (Shaunessy, Suldo, Hardesty, & Shaffer, 2006).

Mixed methods including qualitative approaches have also been used to explore high-achieving students' reflective perceptions of stress during their involvement in AP courses and IB programs. In a survey of 16 recent IB graduates, Taylor and Porath (2006) asked participants to complete 20 likert-style survey questions and also respond to 7 open-ended questions to gather qualitative information regarding their IB experience and postsecondary benefits. Although graduates valued the rich IB curriculum, a sizeable minority reported the workload too excessive and very stressful at times. The graduates indicated that they ruminated over not being able to

complete the requirements of the IB Diploma Program and gaining college acceptance. Additionally, 87.5% of respondents expressed that they were better prepared for post-secondary courses than those not in IB, however only 50% reported feeling less stressed than their general education counterparts. In another qualitative investigation, Vanderbrook (2006) used a phenomenological approach to learn about the perceptions of five intellectually gifted females during their enrollment in AP courses or the IB program. When asked to identify the most challenging aspects of the program, the students expressed that they had difficulty achieving high grades, managing their time due to their heavy course workloads, and memorizing content for year-end course exams. Stress that was associated with academic material was not due to difficulty with comprehension, but was rather due to memorization. Foust, Hertberg-Davis, and Callahan (2009) also explored students' perceptions of the non-academic (e.g., social, emotional) advantages and disadvantages associated with participation in AP courses and the IB program. AP and IB students' responses during in-depth interviews revealed disadvantages of program participation included negative stereotypes, a heavy workload, and heightened stress and fatigue. Students indicated that the workload, pace and level of challenge, and grades they received in their AP and IB courses influenced their emotional state. The most commonly reported consequence of program participation was chronic fatigue due to their intense academic workloads. Students also noted that their stress was often self-induced due to failure to meet their own high academic expectations.

A recent study of environmental stressors faced by a large sample of students in high school AP and IB classes ( $N = 727$  from six schools) confirmed that students' stressors range the gamut from academic concerns (e.g., large amount of homework, difficult classes, overly high expectations for achievement) to conflict with parents (e.g., parents' nagging and hassling,

parents' overly high expectations for achievement; Suldo, Dedrick, Shaunessy-Dedrick, Roth, & Ferron, in press). In accordance with the sentiments students shared through qualitative investigations (e.g., Vanderbrook, 2006), academic requirements produced the highest mean factor score. This further suggests that the academic demands are particularly salient sources of stress for students enrolled in AP courses and IB programs. Beyond the scope of their academic requirements, students reported that environmental factors including conflict with family members and other social relationships (e.g., with peers and teachers), finances, and school-related cultural sensitivity issues served as sources of stress.

### **Theoretical Conceptualizations of Coping**

In a review of coping literature, Moos and Billings (1982) identified five theoretical perspectives through which coping have been investigated. The *psychoanalytic perspective* suggests defense mechanisms are the ways in which the ego wards off anxiety and regains control over impulsive behaviors. As such, coping mechanisms have little to do with the actual environmental stimulus, and are strictly used for emotional regulation and anxiety reduction. The *life-cycle perspective* views coping as a complex process involving mastery and developmental transitions. After transitions are successfully mastered, individuals have increased access to coping resources including self-esteem, self-efficacy, and internal control. Proponents of the *evolutionary and behavior modification perspective* offer that coping consists of complex problem-solving strategies that allow species to return to homeostasis increasing odds of survival. The *cultural and social-ecological perspective* also suggests that coping is necessary for survival, however implies that adaptations are necessary to accommodate conditions within the physical and social environment. Finally, the *integrative perspective* describes coping as one aspect of capabilities that may add to or diminish the demands of daily

life occurrences.

The most widely cited definition of coping is that of Lazarus and Folkman (1984), in which coping is described as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person” (p. 141). Through this conceptualization, coping is recognized as an ongoing dynamic process that changes in response to the demands of stressors encountered, rather than as a set of intrapersonal traits or psychodynamic processes. This definition is part of a greater motivational model of psychological stress and emotion, which emphasizes the impact of cognitive appraisal in determining an individual’s personal stressors. Coping is the goal-directed process that permits an individual to orient thoughts and actions towards resolving stress.

In her later work, Folkman (1997) adapted the transactional model of stress and coping to accommodate positive psychological states. She posits that individuals first appraise environmental transactions as harmful or threatening and subsequently regulate their heightened stress through the use of emotion-focused coping strategies designed for stress reduction or problem management. Coping strategies may lead to a favorable resolution, unfavorable resolution, or no resolution. Emotion is engendered throughout the process of appraisal, coping, and event outcomes; positive psychological states involve three distinct pathways. Through the first, individuals seek to find meaning in the reason for encountering the stressor itself (e.g., through cognitive reappraisal, goal revision in effort to gain greater control, activation of spiritual beliefs). In the second pathway, coping is a response to distress, rather than the conditions that create the distress. This pathway includes the co-occurrence of negative and positive states such that negative psychological states motivate individuals--consciously or subconsciously--to create positive psychological states to gain relief from distress (e.g., through



hope, seeking social support). Finally, in the third pathway, the coping processes that generate positive psychological states and the positive emotional states themselves assist in sustaining renewed coping efforts to manage stress in the future (e.g., through re-engaging in goal-directed activities).

### **Dimensions of Coping Strategies**

Although a broad definition of coping is beneficial to distinguish between coping and other stress responses (e.g., physiological stress regulation), it does not capture the variety of coping strategies and styles individuals use (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001). Theoretically there are infinite coping actions that may be taken for the purpose of reducing stress, ranging from engaging in distractions to get one's mind off of the problem to ruminating about distressing issues with family and friends. Throughout past decades researchers have attempted to categorize coping strategies and subtypes, however consensus has not been achieved regarding the categorizations that best discriminate among dimensions of coping (Compas et al., 2001). Various coping strategies are often grouped together based on cognitive and/or behavioral similarities through empirical procedures frequently including the use of factor analysis (Frydenberg, 1997) and a team of experts who devise a conceptually appropriate label for the coping classification. Many attempts to conceptualize coping actions according to subtype have resulted in dichotomous dimensions of strategies. The most widely used dimensions of coping include problem- versus emotion-focused coping, approach versus avoidance coping, and primary versus secondary coping (Compas et al., 2001).

**Problem versus emotion-focused coping.** Folkman and Lazarus (1980) proposed that coping can be distinguished as two major theory-based functions of coping: problem-focused coping and emotion-focused coping. Problem-focused coping involves taking action to address

the problem causing distress, such as by seeking information, generating solutions to eliminate the problem, and altering the circumstances that cause stress (Compas et al., 2001; Folkman & Moskowitz, 2004). Emotion-focused coping entails eliminating the negative emotions that are related to the problem such as expressing one's emotions, engaging in distracting activities, or seeking social support from others (Compas et al., 2001; Folkman & Moskowitz, 2004). In general, research has found that problem-focused coping decreases psychological symptoms of distress in situations under an individual's control, while emotion-focused coping reduces distress in situations appraised as involuntary (Aldwin, 2007). Although this dimension is popular in research on coping strategies of children and adolescents, criticism has also been widespread due to the overly broad nature of these two general categories (Compas et al., 2001). For example, emotion-focused coping has included strategies ranging from relaxation, writing about one's emotions, and suppressing emotions, to self-criticism. Moreover, some coping strategies, such as walking away from a conflict with a loved one, may have goals that are both problem-focused (e.g., generation of alternative solutions) and emotion-focused (e.g., reducing stress by calming oneself down).

**Approach versus avoidance coping.** The distinction between approach and avoidance coping, also referred to as engagement and disengagement coping, has been popular among research with children, adolescents, and adults (e.g., Blalock & Joiner, 2000; Herman-Stahl, Stemmler, & Petersen, 1995; Marsac, Funk, & Nelson, 2007). Approach coping refers to responses that target the source of stress or one's emotions or thoughts through active engagement (e.g., problem solving, cognitive restructuring). Contrastingly, avoidance coping involves responses that are oriented away from the stressor or one's emotions or thoughts through disengagement (e.g., withdrawal, denial) (Compas et al., 2001). Individuals often use different

strategies at varying phases of the problem, thus shifting back and forth between approach and avoidant coping (Aldwin, 2007). Although approach coping strategies are typically useful for stress reduction, such strategies may result in detrimental outcomes if used in situations out of an individual's control. Moreover, avoidant coping in controllable circumstances may result in an increase in psychological distress, however such strategies in uncontrollable situations may be advantageous for stress reduction (Aldwin, 2007). Avoidant coping strategies can also facilitate problem-focused attempts to reduce stress if they allow an individual to take time to reconsider available resources, thus resulting in approach coping strategies.

**Primary versus secondary control coping.** Coping strategies may also be dichotomized through the dimensions of primary control, in which an individual enhances their personal control over his/her environment, or secondary control, in which one adapts to the environmental demands (Compas et al., 2001). Primary control refers to coping efforts that are directed towards objective events or circumstances associated with the stressor (e.g., leaving the stressful situation), in addition to emotional self-regulation (e.g., managing emotional expression). Secondary control coping entails effort to fit in or adapt to the environment through processes that are frequently cognitive in nature (e.g., acceptance, cognitive restructuring). Researchers have applied the primary and secondary control dimension to both coping responses themselves, and the goals that drive such responses. For example, Rudolph et al. (1995) investigated coping responses of children in medical settings and found that primary control responses were adopted prior to stressful medical procedures (e.g., holding mother's hand) and also reflected secondary control goals (e.g., greater comfort with knowledge of mother's presence).

Dichotomous conceptualizations of coping serve as valuable organizing principles that describe categories of stress responses, however do not fully capture the nuanced features that

may be particular to the developmental context of adolescence. A review of the multidimensional models of adolescent coping is necessary to unpack the complexity of functional and dysfunctional coping methods that impact adolescents' post-stress outcomes.

### **Coping in Adolescence**

Adolescence has been characterized as a developmental period of “storm and stress” during which individuals experience a host of unique stressors including parental conflict, engagement in risk-taking behavior, and mood disruptions (Arnett, 1999), however the degree to which these and other challenges result in detrimental outcomes is partially impacted by access to productive coping strategies (Frydenberg, 2008; Nicolai, Laney, & Mezulis, 2013). It is critical to understand coping within the context of adolescence as strategies used at this time may place individuals on more versus less adaptive developmental trajectories, in addition to serving as a precursor of coping patterns used throughout adulthood (Compas et al., 2001). Additionally, researchers' greater comprehension of functional and dysfunctional adolescent coping strategies may facilitate the education of youth, so that adolescents may develop a greater appreciation for adaptive coping strategies and reduce their risk of psychopathological symptoms resulting from stress.

**Multidimensional models of adolescent coping.** Although dichotomous dimensions of coping including problem- and emotion-focused coping, and approach and avoidance coping are important distinctions historically, studies have demonstrated that these two-dimensional categorizations may not adequately reflect the structure of coping in young people (Compas et al., 2001; Compas & Andreotti, 2013).

***Three-factor control-based model.*** A three-factor control-based model of coping (Compas et al., 2001; Connor-Smith, Compas, Thomsen, Wadsworth, & Saltzman, 2000;

Rudolph et al., 1995) has been validated in several diverse samples of adolescents. The primary distinction in this model is between automatic and voluntary responses to stress. In accordance with Lazarus and Folkman's (1984) definition, coping responses are considered controllable, conscious efforts to regulate cognitive, behavioral, emotional, and physiological responses to stress (Compas & Andreotti, 2013; Connor-Smith et al., 2000). The voluntary coping responses are further distinguished along the dimension of engagement versus disengagement with the stressor. Responses that are oriented towards altering the stressor itself, or a reaction to the stressor, are considered primary control engagement strategies (e.g., problem solving, emotional reservation), while responses aimed at adapting to the stressful environment are deemed secondary control engagement strategies (e.g., cognitive reappraisal, distraction). Stress responses that are oriented away from the stressor or one's feelings are considered disengagement responses (e.g., cognitive and behavioral avoidance, denial). This model has been successfully validated through multiple factor analytic studies of coping strategies adopted by children, adolescents, and adults (Compas & Andreotti, 2013). Furthermore, research investigations have demonstrated that this three-factor control-based model of coping applies to adolescents and young adults with a wide range of stressors (e.g., peer and family relationship stressors, economic stressors, and chronic health issues), from diverse socioeconomic and cultural backgrounds, in addition to international samples (e.g., Euro-American, American Indian, Spanish, Chinese), using multiple informants (Compas et al., 2006, Connor-Smith et al., 2000; Connor-Smith & Calvete, 2004; Wadsworth, Reickmann, Benson, & Compas, 2004; Yao et al., 2010).

***Families of coping.*** After reviewing 100 coping assessments, Skinner, Edge, Altman, and Sherwood (2003) advanced a hierarchical conceptualization of coping behaviors, in which

the 12 higher-order families identified were based on the behaviors' intended adaptive function in response to stress. The 12 factors are summarized in Table 1. In accordance with other researchers, Skinner et al. (2003) note that that the traditional dichotomous conceptualizations of dimensions of coping (e.g., approach vs. avoidance) do not adequately capture the variability in coping strategies employed and thus posit that confirmatory factor analyses based on clearly defined categories and unambiguous items is suitable for identifying lower-order categories, while categorization according to action type may be more appropriate for higher-order categories.

Table 1

*Skinner et al.'s (2003) Twelve Families of Coping*

Family of Coping	Lower-Order Categories Included
1. Problem solving	Direct action, decision making, planning
2. Support seeking	Comfort seeking, help seeking, spiritual support
3. Escape	Avoidance, disengagement, denial
4. Distraction	Acceptance
5. Cognitive restructuring	Positive thinking, self-encouragement
6. Rumination	Intrusive thoughts, negative thinking, self-blame
7. Helplessness	Inaction, passivity, giving up
8. Social withdrawal	Self-isolation
9. Emotional regulation	Emotional expression, self-calming
10. Information seeking	Observation, monitoring
11. Negotiation	Offer exchange, compromise, prioritizing
12. Opposition	Aggression, blame others

**Coping in high achieving youth.** The literature on the social-emotional functioning of gifted students provides insight into the coping strategies used by a subsample of youth enrolled in rigorous high school curricula. In a study that compared the coping strategies used by intellectually gifted and average intelligence sixth graders, Preuss and Debrow (2004) found that gifted children more frequently reported using problem-solving strategies in response to

academic and peer-related stressors. This finding may be due to gifted students' preference for quick and efficient solutions to problems. In another investigation comparing the self-regulatory strategies of high- and low-achieving university students, Ruban and Reis (2006) demonstrated that the academically advanced students reported using more complex, sophisticated strategies that allowed them to manage their academic demands more efficiently and process their curriculum at deeper levels than their low-achieving counterparts.

To date, few empirical studies have investigated the coping strategies employed by youth to overcome heightened academic stress associated with participation in AP courses and IB programs. In a qualitative study conducted by Suldo, Shaunessy, Michalowski, et al. (2008), forty-eight high school IB students participated in eight focus groups (separated according to students' level of anxiety) to uncover the coping styles used to alleviate stress. Participants were asked to describe what they did in response to stress, including the activities and behaviors that were effective in reducing their stressor(s), during 45-75 minute audio-recorded focus groups. Interviews were transcribed and researchers developed initial codes and corresponding definitions for a guidebook used during subsequent rereads of the data. Emergent codes were confirmed through another round of transcript review during which dyads achieved 100% consensus on code assignments, then code frequencies were calculated based on number of times a strategy was noted by a participant. To improve comprehension of the phenomena studied, codes were collapsed into eight thematic families: taking deliberate action steps to address problems, avoiding demands, seeking social support from people within immediate environment, giving self permission to feel positive emotions, maintaining relationships with people outside of immediate environment, sleeping, reducing workload, and being alone. Subthemes (e.g., managing tasks, procrastinating) also emerged. Regarding coping strategies most frequently

used, IB students most often discussed using problem-solving (e.g., task management) and task avoidance (e.g., engagement in other activity) to reduce stress. Of note, students mentioned coping strategies that were either not included or minimized in other traditional assessments of adolescent coping strategies (e.g., Adolescent Coping Orientation for Problem Experiences (A-COPE; Patterson & McCubbin, 1987), including actively managing time to ensure life balance, fixating on problems without action, handling problems alone, sharing assignments with peers, and negotiating assignment deadlines.

In another investigation of IB students' coping behaviors, Shaunessy and Suldo (2010) compared the coping strategies used by intellectually gifted students in the IB program to their IB peers who were not identified as gifted. The researchers reviewed archival qualitative data collected during eight focus groups with 48 students (22 gifted; 26 high-achieving), as described in Suldo, Shaunessy, Michalowski, et al. (2008) above, and collected quantitative data from 141 students in the school (52 gifted; 89 high-achieving) through the A-COPE, a 54-item self-report coping inventory. Examination of frequency counts obtained after the qualitative data collection suggested that gifted IB learners and their high-achieving IB counterparts both reported frequent engagement in coping strategies including taking deliberate actions steps to resolve stressors and seeking social support from others in their immediate environment (e.g., peers in IB).

Furthermore, gifted learners more frequently reported the use of (a) avoiding demands through unrelated activity engagement, (b) taking deliberate action steps to eliminate stress by focusing efforts on enacting a plan, (c) seeking social support from other friends who were not in the IB program, (d) reducing academic stressors by renegotiating expectations, activities, and deadlines, and (e) responding with humor. Conversely, the high-achieving learners who were not identified as gifted were more likely to report coping behaviors including (a) engaging in active problem-



solving relevant to the stressors, (b) spending more time with close friends, and (c) engaging in relaxing activities. Quantitative data were analyzed through a series of paired *t*-tests and results indicated that the two groups of students reported similar use of positive appraisal, negative avoidance, and family communication strategies. However, there was a trend whereby gifted students reported more frequent use of angry coping behaviors (e.g., yelling) than their non-gifted high-achieving peers.

Suldo, Shaunessy, and Hardesty (2008) also demonstrated that high-achieving students' coping behaviors have important associations with academic and mental health outcomes. In a study of 139 IB students, the authors investigated which coping styles were most predictive of mental health outcomes through a series of multiple regression analyses for each outcome variable (GPA, academic self-efficacy, life satisfaction, internalizing behavior, externalizing behavior). Four styles of coping were examined via factors made from A-COPE items, specifically: positive appraisal, negative avoidance, family communication, and anger. Within each regression analysis, coping styles were entered as predictor variables. Regarding mental health outcomes, all four coping styles combined accounted for nearly one-third of the variance in life satisfaction, 17% of the variance in internalizing symptoms, and 40% of the variance in externalizing symptoms. With respect to academic functioning, coping styles accounted for 19% of the variance in academic self-efficacy, but were not collectively a statistically significant predictor of GPA. Moderation effects of coping styles on the relationship between stress and mental health outcomes were also tested. The researchers found that the addition of stress and coping interaction terms to the base model (i.e., mental health outcomes predicted by stress and coping strategies separately) produced a significant  $R^2$  change in life satisfaction and internalizing behavior. Specifically, the interaction between stress and positive appraisal coping

was significant for life satisfaction; and the interaction between stress and anger coping was significant for internalizing behavior.

The most recent research conducted on the coping behaviors relevant to high-achieving students pertains to the development of a multidimensional measure of coping specific to this population, as opposed to adolescents in general. Suldo, Dedrick, Shaunessy-Dedrick, Fefer, and Ferron (in press) developed a conceptual framework of coping that was primary based on Skinner and colleagues' (2003) 12-family conceptualization, and modified in line with findings from prior research of AP and IB students (Foust, Hertberg-Davis, & Callahan, 2009; Suldo, Shaunessy, Michalowski, et al., 2008). Modifications include adding "sleep" as a primary coping behavior, and including diversions in the avoidance rather than the accommodation family. A 120-item coping measure was developed to assess these 12 families with a sample of 727 high school students. The resulting 58 items in 16 factors that were retained after factor analytic and item reduction procedures are described in Table 2. Both of the coping factors with the highest means (i.e., Cognitive Reappraisal, Handle Problems Alone) emerged in Suldo, Shaunessy, Michalowski, et al.'s (2008) prior exploratory investigation of IB students, however the greater frequency with which students reported handling problems alone in this sample of AP and IB student underscores the saliency of this strategy for high-achieving youth.

Research literature has demonstrated that adolescents face a variety of normative stressors due to interpersonal and intrapersonal changes during their transition to adulthood, however the extent to which such result in negative outcomes (e.g., psychological distress) is partially impacted by the use of appropriate coping strategies. As such, it is challenging to disentangle the degree to which environmental stressors disrupt adolescent functioning without also investigating the coping strategies employed to reduce stress. Exploring the changes in both

environmental stressors and coping responses throughout the developmental phase of adolescence permits understanding of the type and magnitude of stressors experienced at a given age, as well as the ages during which adolescents most frequently use a given coping strategy.

Table 2

*Coping with Academic Demands Scale Factors*

Factor Name	Strategies Included in Factor
F1. Time and Task Management	Prioritize academic tasks, focus on work until it's complete, organize materials, break tasks into manageable parts, use a planner to keep track of activities
F2. Cognitive Reappraisal	Adopt an optimistic attitude, tell yourself you can do it, put things into perspective, remind self of future program benefits
F3. Seek Academic Support	Get extra help from tutors, study with peers, ask teachers about assignments/coursework
F4. Turn to Family	Vent to parents, spend time with family
F5. Talk with Friends and Classmates	Vent to classmates or friends outside of the program, talk to others to get mind off of the problem
F6. Skip School	Skip school to get work done, take a day off from school to relax or sleep, skip school to avoid taking a test you're unprepared for
F7. Social Diversions	Hang out with friends, have fun with others to get mind off the problem, go shopping
F8. Athletic Diversions	Play team sports, exercise, take part in extracurricular activities
F9. Creative Diversions	Write creatively, write about problems or feelings, pursue a hobby of interest (e.g., cooking, drawing, playing an instrument)
F10. Technology Diversions	Surf the internet, play videogames, watch TV or videos
F11. Substance Use	Drink alcoholic beverages, use drugs, smoke cigarettes or use other tobacco products
F12. Reduce Effort on Schoolwork	Stop caring about schoolwork, stop trying/ give up, work less on assignments that are less important, turn in assignments late
F13. Handle Problems Alone	Keep problems to yourself, try to ignore feelings of stress, become quiet, try to handle things alone
F14. Deterioration	Get mad, annoyed, or irritated, take it out on other people, continue to think about the problem, freak out about the problem without trying to fix it
F15. Sleep	Take naps, sleep to recharge so you can fix the problem, sleep to put off the problem
F16. Spirituality	Pray, rely on faith to deal with the problem, go to a place of worship

Findings of this nature could lead to the education of youth on the use of appropriate coping strategies at the developmental age during which they (a) experience the greatest environmental stress and/or (b) typically adopt maladaptive coping strategies.

### **Changes in Stress and Coping throughout Adolescence**

The events and circumstances that promote stress change throughout the course of adolescent development. As such, stressors that are salient during early adolescence often become increasingly manageable, while unique stressors emerge during the latter part of this developmental phase. Relationship stressors are among those that have a large impact during the beginning adolescence, as younger adolescents report experiencing higher levels of stress generated by interactions with family and romantic partners compared to middle and late adolescents (Laursen, Coy, & Collins, 1998; Nieder & Seiffge-Krenke, 2001). This stress is often generated by attempts to achieve independence from parents and navigate a relationship with a significant other for the first time. In contrast, older adolescents face greater levels of stress related to their academic achievement and supplemental college and career goals. Case in point, Lee, Puig, Lea, and Lee (2013) investigated the academic burnout of 1,530 South Korean students ages 11 (fourth grade) to 19 (twelfth grade) and found that scores on all four dimensions of the Korean Academic Burnout Inventory (i.e., inefficacy, antipathy, exhaustion, cynicism) increased gradually as age increased. In another investigation of adolescent stressors, Code, Bernes, Gunn, and Bardick (2006) assessed the perceived career concerns of 6,481 Canadian junior high and high school students. Findings from the study indicate that high school students expressed more concern with making the “wrong occupational choice” and “having to decide” on a career than junior high students. High school students also reported that they felt greater urgency with regard to their occupational concerns influenced by impending graduation dates.

Previous research has also demonstrated that the time of maturation may influence an individual's perception of stress. For example, Ge, Conger, and Elder (1996) found that early-maturing girls experience higher levels of psychological distress compared to late and on-time maturers. This suggests that adolescents who undergo puberty at a younger age may not be psychologically prepared for the environmental challenges they face and thus experience greater stress than those maturing later in this transitional phase.

The developmental changes in adolescents' cognitive processing and metacognitive skills may also influence their selection of coping strategies used to manage stress. Although the formal cognitive operations that allow individuals to consider different behavioral responses and evaluate consequences typically emerge during early adolescence, individuals often lack the emotional maturity to select productive methods of coping. Research has demonstrated that between the ages of 12 and 18, adolescents become more effective in determining the best source of support for handling stressful situations (Skinner & Zimmer-Gembeck, 2007). Studies examining age-dependent changes in the use of specific coping strategies have yielded inconclusive results, which may be influenced by different conceptualizations of coping processes (e.g., cognitive versus behavioral). For example, Seiffge-Krenke (1993) found that use of cognitive restructuring increases in middle and late adolescence, while Donaldson, Prinstein, Danovsky, and Spirito (2000) reported an increase in early and late adolescence but a decrease during the middle phase. Other investigations of developmental changes in coping have demonstrated that emotion-focused coping strategies (e.g., distraction) decrease throughout adolescence, while problem-focused strategies (e.g., support seeking) remain stable throughout early and middle adolescence (Hampel & Petermann, 2005).

Some researchers have used factor analysis to determine which categories of coping strategies are used throughout specific phases of child and adolescent development. In a cross-sectional investigation of coping across the lifespan, Amirkhan and Auyeung (2007) reported that the same three coping strategies (i.e., problem solving, avoidance, seeking social support) were used by all age groups; however, the frequency with which each strategy was employed varied between pre-teens, early teens, late teens, and young and old adults. Consistent with other empirical findings, the researchers noted a general increase in the use of problem-oriented strategies, a decrease in avoidant coping strategies, and stable use of support-seeking strategies among individuals at each stage of adolescence. Zimmer-Gembeck and Skinner's (2011) comprehensive review of 58 studies of coping across developmental contexts revealed that, in general, children and adolescents' repertoire (i.e., number and diversity) of coping strategies increases with age. Compared to children, adolescents more frequently manage stress through engaging in planful problem-solving and recognition of internal emotional states which may be improved through positive self-talk and/or self-regulation. Furthermore, despite overall low levels of stress reactions, young adolescents more often employ maladaptive coping strategies, including cognitive escape, rumination, venting, and verbal aggression. Zimmer-Gembeck and Skinner hypothesize that adolescents' increasing capacity to reflect on their own emotions may also account for emotional vulnerabilities, such as rumination.

In general, the age-related differences in stress and coping strategies have been identified using cross-sectional data, with fewer studies examining the longitudinal differences in youth's environmental stress and coping over time. In an exception, Groër, Thomas, and Shoffner (1992) explored across-time difference in adolescents' environmental stress and coping within a sample of 167 general education students from one large, suburban high school. During 9<sup>th</sup>

grade and three years later during 12<sup>th</sup> grade, students reported their environmental stressors using the Adolescent Life Change Event Scale (ALCES; Yeaworth, York, Hussey, Ingle, & Goodwin; 1980) as well as methods of coping via open-ended items (exact items not provided in manuscript). Results from paired *t*-tests revealed that there was a significant increase in environmental stressors over time. When in 9<sup>th</sup> grade, students reported a lower ALCES score ( $M = 309, SD = 182.5$ ) than when in 12<sup>th</sup> grade ( $M = 403.6, SD = 208.7$ ). Students' most frequent stressors experienced as both time points included hassling with parents, hassling with siblings and making new friends. As freshmen, participants' top stressors also included in changes in appearance and problems with size; as seniors, starting a new job and difficulty dating completed the list. Regarding coping, 101 freshmen and, three years later, 96 seniors reported one or more methods of coping on the open-ended item. Active distraction strategies (e.g., walking, exercising) were the most frequently reported coping methods at both time points; however, by their senior year, participants reduced their frequency of active distraction, and increased their use of passive distraction (e.g., reading, music) between 9<sup>th</sup> and 12<sup>th</sup> grade.

In another longitudinal investigation of youth coping, Frydenberg and Lewis (2000) explored changes in the coping strategies of 168 Australian adolescents over a five-year span (grades 7-11) to determine at what age educational intervention may be appropriate. At three time points-- grades 7 (ages 12-13), 9 (ages 14-15), and 11 (ages 16-17)—participants completed the Adolescent Coping Scale (ACS; Frydenberg & Lewis, 1993), an 80-item self-report checklist that measures 17 distinct methods of coping in response to stress, and one scale of one's inability to cope, termed Not Cope (as described in Table 3).

Table 3

*Frydenberg and Lewis's (2000) Conceptual Areas of Coping*

Solving the Problem	Non-Productive Coping	Reference to Others
Seek Social Support	Worry	Seek Spiritual Support
Focus on Solving the Problem	Seek to Belong	Seek Professional Help
Physical Recreation	Wishful Thinking	Social Action
Seek Relaxing Diversions	Ignore the Problem	
Invest in Close Friends	Tension Reduction	
Work Hard and Achieve	Keep to Self	
Focus on the Positive	Self-blame	
	Not Cope	

Data were analyzed using a series of two-way repeated measures ANOVAs in which the student's age level during the year of administration and sex were independent variables, and each of the 18 coping factors were dependent variables. The coping methods students relied on most frequently across all three time points included Seek Relaxing Diversions and Work Hard and Achieve. In total, 12 coping methods (Seeking Social Support, Solve Problem, Worry, Not Cope, Tension Reduction, Social, Action, Self-blame, Keep to Self, Seek Spiritual Support, Seek Professional Help, and Physical Recreation) displayed significant changes with respect to year level. Of note, mean levels of five of these methods (Seeking Social Support, Solving the Problem, Self-blame, Keep to Self, and Tension Reduction) remained stable for adolescents between grades 7 and 9, then increased significantly between grade 9 and 11. Of the remaining coping methods that evidenced change, mean levels of three of them (Social Action, Spiritual Support, and Physical Recreation) decreased in usage between grades 7 and 9, then remained stable until grade 11. Overall, findings indicate an increase in the number of coping strategies (including both productive [Solving the Problem and Reference to Others] and non-productive) adolescents use between grades 9 and 11. Given that the greatest shift in coping occurred between grades 9 and 11, and that 11<sup>th</sup> graders were significantly higher than 9<sup>th</sup> graders on the



scale measuring one's inability to cope (i.e., Not Cope), the authors suggest that 9<sup>th</sup> grade may be an optimal time for educational intervention.

**Changes in stress and coping of high-achieving students.** The literature on changes in stress and coping strategies of students in accelerated high school academic programs remains nearly nonexistent. In one exception, Suldo and Shaunessy-Dedrick (2013b) investigated adolescents' change in stress level upon entering the IB program in ninth grade. Participants included 134 students (112 IB and 22 general education) ages 13 to 15 (during initial data collection) from three public high schools. To determine change in stress level, participants completed the PSS (Cohen et al., 1983) during the summer prior to entering high school and after completing their first semester of high school. Results from a mixed-model ANOVA indicate that the curriculum group x time interaction was significant,  $F(1, 132) = 4.99, p = .03$ ; perceived stress scores of the students who entered the IB program (slope = .54) increased at a significantly faster rate than their general education peers (slope = .08). In the summer, IB students had lower mean PSS scores than their general education peers, but higher scores after entry to high school. In sum, findings suggest that students in the IB program experience a heightened increase in stress level upon entering high school relative to their general education counterparts, whose stress levels remain relatively stable during this academic transition. Although this study shows changes in stress using the transactional model (*perceived stress*) upon IB program entry, similar longitudinal studies are needed to examine the changes in *environmental stressors* of students in rigorous high school curricula (i.e., the IB program and AP courses) throughout each grade level progression. Furthermore, cross-sectional analyses on the environmental stressors experienced by, and coping strategies used by, high school students in accelerated curricula could also contribute to the scant literature particular to this group of high-achieving youth.

## Summary of Literature

In sum, despite the large body of literature pertaining to adolescent stress and coping strategies, the environmental stressors and academic coping strategies specific to high-achieving high school youth remains understudied. In part because of the national expansion of IB programs and AP courses, and corresponding increase in student enrollment, there is a need to understand the impact of accelerated high school curricula on students' social and emotional functioning.

Stress has been conceptualized from a variety of theoretical perspectives. Current leaders in the field (e.g., Grant et al., 2003) advocate for use of the environmental model whereby stress is defined as objective occurrences of stressful life events and conditions independent of varying individual cognitive appraisals. Adolescents in AP and IB encounter a variety of normative environmental stressors, including conflict with parents and confrontation with peers, in addition to their challenging academic requirements (Suldo, Dedrick, Shaunessy-Dedrick, Roth, & Ferron, in press). Others may also encounter non-normative major life events that can deter one's ability to cope including the death of a friend, parents' divorce, or family move (Suldo, Dedrick, Shaunessy-Dedrick, Roth, & Ferron, in press). High-achieving high school students enrolled in rigorous academic curricula report particularly high levels of academic stress (Suldo, Shaunessy, & Hardesty, 2008; Suldo, Shaunessy, Thalji, Michalowski, & Shaffer, 2009). However, this population also experiences better academic performance and commensurate levels of psychopathology with their general education peers (Suldo & Shaunessy-Dedrick, 2013a).

The extent to which adolescents are negatively impacted by their stressful life experiences is in part affected by their use of functional coping strategies. A multidimensional

model appears most suitable for capturing coping strategies employed during adolescence. Recent research with high-achieving high school students suggest these students frequently adopt problem solving (primary control engagement) and avoidance or handling problems alone (disengagement) strategies to cope with their academic demands. Empirical findings also indicate that high-achieving students' coping behaviors play a key role in determining their mental health outcomes (Suldo, Shaunessy, & Hardesty, 2008).

Previous research documents that the events and circumstances that generate stress may change throughout the course of adolescent development. For example, younger adolescents report experiencing higher stress caused by relationships than middle or older adolescents, while older adolescents report greater stress generated by academic requirements, and college and career goals. Similarly, adolescents may employ different coping strategies throughout this developmental stage due to changes in metacognitive functioning and emotional maturity (Seiffge-Krenke, 1993; Skinner & Zimmer-Gembeck, 2007). Case in point, social support seeking coping strategies may remain stable throughout adolescence, while problem-focused strategies increase and avoidant strategies decrease (Amirkhan & Auyeung, 2007). This extent to which these findings hold true for high-achieving adolescents enrolled in rigorous high school curricula has not yet been explored.

While preliminary findings suggest that high school students enrolled in accelerated academic curricula experience a greater increase in stress levels than their general education peers (Suldo & Shaunessy-Dedrick, 2013b), the frequency with which environmental stressors are encountered year-over-year throughout high school has not yet been explored. Moreover, the changes in corresponding coping strategies high-achieving students use to manage stressors associated with their academic demands throughout high school remain unknown.

## **Purpose of the Current Study**

To date, there are no published longitudinal investigations of the changes in environmental stressors and accompanying coping strategies in a sample of high-achieving high school students enrolled in accelerated academic curricula. Furthermore, the literature contains no cross-sectional studies of the differences in the environmental stressors experienced by, and coping strategies used by, high-achieving high school students enrolled in different grade levels. In part due to the increasing popularity of accelerated high school curriculum among high-achieving youth, and the advantageous academic, economic, and social-emotional outcomes realized by many students who are able to successfully manage such curricula, there remains a need to identify and address the social-emotional challenges (e.g., primary stressors) related to enrollment.

The purpose of this study was to examine developmental trends in stressors and coping strategies used by high school students within accelerated academic programs. The study aimed to provide key stakeholders such as teachers, parents, school psychologists, guidance counselors, and school administrators with information regarding the particular stressors most common to students enrolled in a given grade level within accelerated academic programs. Namely, greater comprehension of the specific stressors students encounter during each grade level may inform school implementation of targeted prevention and intervention efforts that match students' needs. Moreover, findings from the investigation of the grade levels during which students differentially rely on various coping strategies were intended to shed light on the stability of diverse coping styles throughout high school, and can be used to inform efforts to target developmental levels during which students may need more support to acquire more effective approaches to actively manage (vs. avoid) stressors. By identifying the environmental stressors and academic coping

strategies that predict students' success, this study further aimed to inform efforts to limit students' exposure to environmental stressors that are associated with lower academic achievement and life satisfaction, as well as promote use of academic coping strategies that are associated with higher academic achievement and life satisfaction. In order to accomplish these research objectives, this study answered the following research questions:

1. To what extent, if any, do high-achieving high school students' environmental stressors change between Time 1 and one year later, at Time 2?
2. To what extent, if any, do high-achieving high school students' strategies for coping with academic demands change between Time 1 and one year later, at Time 2?
3. Do environmental stressors experienced by high-achieving high school students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?
4. Do strategies for coping with academic demands used by high-achieving high school students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?
5. To what extent do high-achieving high school students' environmental stressors predict their success in terms of:
  - a. Academic achievement
  - b. Life satisfaction?
6. To what extent do high-achieving high school students' strategies for coping with academic demands predict their success in terms of:
  - a. Academic achievement
  - b. Life satisfaction?

### **Chapter III: Method**

The current study explored the environmental stressors and academic coping strategies of high-achieving high school students enrolled in AP courses and IB programs. Longitudinal data analyses provided information on the within-student changes that occur between the one-year transition from ninth to tenth, tenth to eleventh, or eleventh to twelfth grade. Cross-sectional analyses provided information concerning the differences in environmental stressors and academic coping strategies of students enrolled in each grade level. Finally, logistic regression analyses reflected the relationship between students' stressors, as well as academic coping strategies, and their likelihood of success in terms of academic achievement and life satisfaction. This study is quantitative in nature and analyzed existing data that were collected as part of a larger investigation of the social-emotional functioning of students enrolled in accelerated high school curricula. The following chapter describes the data source for this study, the measures administered, procedures of data collection, and the analyses conducted.

#### **Participants**

**Data source.** The current study conducted secondary analyses using an archival dataset. The dataset is part of a larger research project, consisting of seven sequential studies, which was funded by the Institute of Education Science (IES) in a grant (R305A100911) awarded to Dr. Shannon Suldo and Dr. Elizabeth Shaunessy-Dedrick. The purpose of the IES-funded project was to investigate the intense academic demands of high school students enrolled in rigorous college-level courses, and identify the malleable factors associated with students' success in terms of positive mental health and high academic achievement. The datasets analyzed in the

current study included data collected from Study 6 (purpose: develop and validate self-report measures of AP and IB students' stressors and coping strategies;  $N = 727$ ) and Study 7 (purpose: determine associations between environmental and intrapersonal factors and students' success;  $N = 2,379$ ). Specifically, data collected from the 184 AP and IB students who participated in both studies 6 and 7 were examined using longitudinal analyses, and data from the 2,379 AP and IB students who participated in Study 7 were investigated using cross-sectional analyses. The author of the current study became a member of the research team soon after data were collected, and participated in data entry and verification during Fall 2012 and Spring 2013. The Institutional Review Board (IRB) for human subject research at the University of South Florida (USF) approved study procedures and personnel.

**Longitudinal sample.** The descriptive statistics of the student participants in both Study 6 (Time 1) and Study 7 (Time 2) are summarized in Table 4. All participants were high school students enrolled in either an IB program or AP course(s) in the Spring of 2011 and throughout the Spring of 2012. A total of 184 students (30.4% 9<sup>th</sup> grade; 34.2% 10<sup>th</sup> grade; 35.3% 11<sup>th</sup> grade at Time 1) comprised the sample. Participants attended six high schools (3 with IB programs, and 3 with AP courses) within three school districts in one southeastern state. Females were slightly over-represented in the sample (64.7%) compared to males, and 13.6% of participants were considered low SES based on self-report of receiving free or reduced-price lunch. In terms of race and ethnicity, the sample is diverse (68.5% Caucasian; 12.0% Hispanic; 2.7% African American; 15.8% Asian; 6.0% multiracial; 7.1% other group identity). Of the 184 students in the sample, 42.4% were enrolled in IB programs and 57.6% were enrolled in AP course(s). The average number of AP courses taken by the sample was 1.70 ( $SD = 1.18$ ) and 2.14 ( $SD = 1.67$ ) at

Time 1 and Time 2, respectively. Further descriptive information regarding AP course participation at both time points is provided in Table 5.

Table 4

*Demographic Characteristics of Longitudinal Sample (Study 6 and 7 Participants)*

Variable	AP ( <i>n</i> = 106)		IB ( <i>n</i> = 78)		Total Sample ( <i>n</i> = 184)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	37	34.9	28	35.9	65	35.3
Female	69	65.1	50	64.1	119	64.7
Grade Level (Time 1)						
9th	35	33.0	21	26.9	56	30.4
10th	37	34.9	26	33.3	63	34.2
11th	34	32.1	31	39.7	65	35.3
Free or Reduced-Price Lunch						
No	89	84.0	70	89.7	159	86.4
Yes	17	16.0	8	10.3	25	13.6
Race/Ethnicity						
Caucasian	83	78.3	43	55.1	126	68.5
African American	1	0.9	4	5.1	5	2.7
Asian	8	7.5	21	26.9	29	15.8
Hispanic	18	17.0	4	5.1	22	12.0
Multiracial	7	6.6	4	5.1	11	6.0
Other group identity	7	6.6	6	7.7	13	7.1

*Note.* AP = Advanced Placement; IB = International Baccalaureate

**Cross-sectional sample.** The descriptive statistics for the student participants in Study 7 are summarized in Table 6. All participants were high school students enrolled in IB programs or AP course(s) in the Spring of 2012. A total of 2,379 students (25.4% 9<sup>th</sup> grade; 27.1% 10<sup>th</sup> grade; 24.9% 11<sup>th</sup> grade; 22.6% 12<sup>th</sup> grade) were included in the sample. Participants attended 19 high schools (nine with IB programs; nine with AP courses; one with both an IB program and a set series of AP courses) within five school districts within a single southeastern state. Females were slightly over-represented in the sample (62.2%) compared to males, and 27.7% of students were considered low SES based on self-report of receiving free or reduced-price lunch. In terms



of race and ethnicity, the sample is diverse (48.8% Caucasian; 12.1% Hispanic; 11.7% African American; 13.3% Asian; 12.9% multiracial; 1.2% other group identity). Of the 2,379 participants in the sample, 51.7% were enrolled in IB programs and 48.3% were enrolled in AP course(s). The average number of AP courses taken by the sample was 1.78 ( $SD = 1.46$ ), however the number ranged from 0 to 9 AP courses. Further descriptive information regarding AP course participation across grade levels is provided in Table 7.

Table 5

*Mean, Standard Deviation, and Range of AP Courses Taken Across Grade Levels (Study 6 Participants- Combined AP and IB Sample)*

Grade level	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
Time 1					
9 <sup>th</sup>	56	0	1	0.73	0.45
10 <sup>th</sup>	63	0	5	1.40	0.77
11 <sup>th</sup>	65	1	6	2.83	1.01
Total	184	0	6	1.70	1.18
Time 2					
10 <sup>th</sup>	56	0	3	1.46	0.79
11 <sup>th</sup>	63	0	9	2.30	1.24
12 <sup>th</sup>	65	0	7	2.55	2.31
Total	184	0	9	2.14	1.67

### Student Self-Report Measures

**Demographics form.** The demographics forms for Study 6 (see Appendix A) and Study 7 (see Appendix B) contained questions concerning students' grade level, gender, race, ethnicity and socioeconomic status. Socioeconomic status was assessed based on students' free or reduced-price lunch status, as well as mother's and father's educational levels.

**Student Rating of Environmental Stressors Scale (StRESS; Suldo, Dedrick, Shaunessy-Dedrick, Roth, & Ferron, in press).** The StRESS is a 37-item self-report measure of stressors and major events faced by high school students pursuing accelerated curricula (see

Appendix C). It was developed by the research team in earlier stages of the larger IES-funded project using pre-existing literature on stress, responses from students, parents, and teachers during focus groups, and results from pilot studies with students.

Table 6

*Demographic Characteristics of Cross-Sectional Sample (Study 7 Participants)*

Variable	AP ( <i>n</i> = 1,150)		IB ( <i>n</i> = 1,229)		Total Sample ( <i>n</i> = 2,379)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Gender						
Male	402	35.0	489	39.8	891	37.4
Female	735	63.9	731	59.5	1466	61.6
Grade Level						
9th	287	25.0	317	25.8	604	25.4
10th	349	30.3	295	24.0	644	27.1
11th	276	24.0	317	25.8	593	24.9
12th	238	20.7	300	24.4	538	22.6
Free or Reduced-Price Lunch						
No	782	68.0	937	76.2	1719	72.2
Yes	367	32.0	290	23.6	657	27.6
Race/Ethnicity						
Caucasian	623	54.2	530	43.1	1153	48.5
African American	123	10.7	153	12.4	276	11.6
Asian	70	6.1	244	19.8	314	13.2
Hispanic	160	13.9	125	10.2	285	12.0
Multiracial	157	13.7	149	12.1	306	12.9
Other group identity	10	.9	19	1.5	29	1.2

*Note.* AP = Advanced Placement; IB = International Baccalaureate

Table 7

*Mean, Standard Deviation, and Range of AP Courses Taken Across Grade Levels (Study 7 Participants- Combined AP and IB Sample)*

Grade level	<i>N</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
9 <sup>th</sup>	604	0	3	0.80	0.57
10 <sup>th</sup>	644	0	6	1.53	1.06
11 <sup>th</sup>	593	0	9	2.53	1.22
12 <sup>th</sup>	538	0	9	2.34	2.00

Additional items that were in a previous version of the measure were eliminated after factor analytic procedures; additional item response options were also removed prior to Study 7.

Respondents indicate on a 5-point scale (1 = *Never Happened* to 5 = *Almost Always Happened*) the degree to which they experienced an event or situation (e.g., “Parents hassling and nagging you,” “Multiple tests and/or assignments due on the same day”) within the given school year.

Higher scores represent a greater frequency of stressors experienced within a given factor.

The StRESS items contribute to five factors: Academic Requirements (13 items), Parent-Child Conflict (6 items), Academic and Social Struggles (7 items), Financial Problems (3 items), and Cultural Issues (3 items); and one composite score: Major Life Events (5 items). Major Life Events is conceptualized as a composite variable because the health and family-related events included as items (e.g., “Health issues” and “Separation or divorce of parents”) do not necessarily co-occur or correlate. Table 8 displays the internal consistency reliability and sample items for the five StRESS factors and Major Life Events composite.

Table 8

*Student Rating of Environmental Stressors Scale Factors, Reliability, and Sample Items*

Factor Name	# of Items	$\alpha$	Sample Item
F1. Academic Requirements	13	.88	Multiple tests and/or assignments due on the same day
F2. Parent-Child Conflict	6	.81	Parents’ overly high expectations for achievement
F3. Academic and Social Struggles	7	.67	Problems related to romantic relationships, such as arguments with boy/girlfriend, breaking-up, etc.
F4. Financial Problems	3	.78	Not enough money to do or buy the things that you want
F5. Cultural Issues	3	.76	Having classmates who do not understand your culture or ethnic/racial group
Major Life Events	5	.48	Separation or divorce of parents

Suldo, Dedrick, Shaunessy-Dedrick, Roth, et al. (in press) reported four of the five StRESS factors to have high internal consistency ( $\alpha = .76-.88$ ), and one factor (Academic and Social Struggles) to have acceptable internal consistency ( $\alpha = .67$ ). The test-retest reliability coefficients ranged from .71 (Major Life Events) to .89 (Parent-Child Conflict). Intercorrelations between the StRESS scales were found to be small ( $r = .09$ ) to moderate ( $r = .40$ ) in magnitude. The authors also found the StRESS scale to demonstrate moderate to high correlations with other measures of psychological and environmental stress. Specifically, the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) yielded a large association with Academic Requirements ( $r = .53$ ), and moderate associations with Parent-Child Conflict ( $r = .41$ ), Financial Problems ( $r = .34$ ), and Academic and Social Struggles ( $r = .43$ ). Positive correlations between the PSS and Cultural Issues and Major Life Events were small in magnitude, but also statistically significant. The correlation between the composite score from the Life Events Checklist (LEC; Johnson & McCutcheon, 1980) and the StRESS Major Life Events was strong ( $r = .51$ ). The LEC was also moderately correlated with Financial Problems ( $r = .45$ ), and yielded small but significant associations with the remaining StRESS factors.

**Coping with Academic Demands Scale (CADS; Suldo, Dedrick, Shaunessy-Dedrick, Fefer, & Ferron, in press).** The CADS is a 58-item inventory measuring the behaviors students in accelerated academic programs use to cope with academic stressors (see Appendix D). It was developed by the research team in earlier stages of the larger IES-funded project using pre-existing literature on coping, responses from students, parents, and teachers during focus groups, and results from pilot studies with students. Additional items that were in a previous version of the measure were eliminated after factor analytic procedures. Respondents indicate on a 5-point scale (1 = *Never* to 5 = *Almost Always*) how frequently they used specific coping strategies (e.g.,

“Try to handle things on your own,” “Avoid thinking about the problem”) in response to school-related challenges or stress during the current academic year.

The CADS items contribution to 16 factors: Time and Task Management, Cognitive Reappraisal, Seek Academic Support, Turn to Family, Talk with Classmates and Friends, Skip School, Social Diversions, Athletic Diversions, Creative Diversions, Technology Diversions, Substance Use, Reduce Effort on Schoolwork, Attempt to Handle Problems Alone, Deterioration, Sleep, and Spirituality. Table 9 displays the internal consistency reliability and sample items for the 16 CADS factors.

Suldo, Dedrick, Shaunessy-Dedrick, Fefer, et al. (in press) established that internal consistency was high ( $\alpha \geq .70$ ) for 11 of the 16 factors. Four of the factors with acceptable alphas below .70 contained just three items (Seek Academic Support,  $\alpha = .55$ ; Social Diversions,  $\alpha = .68$ ; Creative Diversions,  $\alpha = .62$ ; Technology Diversions,  $\alpha = .53$ ), while Handle Problems Alone ( $\alpha = .61$ ) contained four items. All test-retest reliability coefficients were above .70 and ranged from .71 (Sleep) to .93 (Substance Abuse). The authors also demonstrated high concurrent validity with factors associated with task, emotion, and avoidance-oriented coping. Specifically, the CADS factors of Time and Task Management, Cognitive Reappraisal, and Seek Academic Support had moderate, positive correlations with the School-Related Stress Questionnaire (CSSQ; Wrzesniewski & Shylinksa, 2007) Coping with the Task Oriented Coping subscale ( $r = .48, .48, \text{ and } .29$ , respectively). The CSSQ Emotion-Oriented Coping factor yielded large associations with Talk with Classmates and Friends ( $r = .65$ ) and Deterioration ( $r = .59$ ), and a moderate correlation with the Turn to Family factor ( $r = .33$ ). The CSSQ Avoidance-Oriented Coping subscale had moderate to strong correlations with avoidance-related factors on the CADS, including Social Diversions ( $r = .65$ ), Sleep ( $r = .40$ ), Skip School ( $r = .36$ ),

Technology Diversions ( $r = .30$ ), Substance Use ( $r = .28$ ), and Reduce Effort on Schoolwork and Athletic Diversions ( $r = .26$ ). The remaining three CADS factors (Creative Diversions, Spirituality, Attempt to Handle Problems Alone) had weak, though sometimes significant, correlations with one to three of the CSSQ factors.

Table 9

*Coping with Academic Demands Scale Factors, Reliability, and Sample Items*

Factor	# of items	$\alpha$	Sample Item
F1. Time and Task Management	6	.77	Prioritize the order in which you complete your work.
F2. Cognitive Reappraisal	4	.74	Tell yourself that you can do it, for example that you've managed similar situations before.
F3. Seek Academic Support	3	.55	Study with other students.
F4. Turn to Family	3	.79	Talk to parent(s) about what's bothering you.
F5. Talk with Friends and Classmates	4	.75	Talk to classmates (friends in your school program) about what's bothering you.
F6. Skip School	3	.86	Take a day off from school to get work done.
F7. Social Diversions	3	.68	Have fun with other people to get your mind off the problem.
F8. Athletic Diversions	3	.73	Play team sports (basketball, soccer, football, crew, etc.).
F9. Creative Diversions	3	.62	Write creatively (poetry, lyrics, etc.).
F10. Technology Diversions	3	.53	Surf the Internet (YouTube, news websites, etc.).
F11. Substance Use	3	.71	Drink alcoholic beverages, such as beer, wine, liquor, etc.
F12. Reduce Effort on Schoolwork	4	.79	Stop caring about schoolwork.
F13. Handle Problems Alone	4	.61	Keep problems to yourself.
F14. Deterioration	6	.79	Panic or "freak out" about the problem without trying to fix it.
F15. Sleep	3	.75	Sleep to recharge so you can tackle a problem.
F16. Spirituality	3	.90	Rely on your faith to help deal with the problem.

**Students' Life Satisfaction Scale (SLSS; Huebner, 1991).** The SLSS is a 7-item self-report measure of global life satisfaction (see Appendix E). Respondents are asked to indicate on a 6-point scale (1 = *Strongly Disagree* to 6 = *Strongly Agree*) the degree to which they endorse statements about the quality of their lives (e.g., “My life is just right,” and “I would like to change many things in my life” [reverse-scored]). Higher mean scores represent greater levels of global life satisfaction.

Huebner (1991) reported the SLSS to have high internal consistency ( $\alpha = .82$ ) and convergent validity with other measures of subjective well-being. Specifically, the Piers-Harris Happiness subscale (Piers, 1984), Andrews and Withey's (1976) measure of life satisfaction, and Bradburn's (1969) measure of subjective well-being yielded significant correlations with the SLSS; ranging from .36 to .62 (Huebner, 1991). Previous research with high school students demonstrates that the SLSS has strong internal consistency ranging from  $\alpha = .82$  to .86 (Gilman & Huebner, 1997; Suldo & Huebner, 2006) and moderate convergent validity, as demonstrated through the comparison of students' SLSS scores and parents' ratings of their child's global happiness ( $r = .48$ ; Dew & Huebner, 1994).

### **Data from Participants' School Records**

**Grades earned in classes.** Students' academic achievement was indexed by their unweighted GPA for the current semester at the time of data collection during Study 7 (i.e., Spring 2012). The research team calculated students' GPA by averaging the final grades earned during the spring semester, across all courses taken for high school credit that semester. Students were awarded the following points per course grade earned: A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0. Therefore, GPA ranged from 0 to 4.0.

## **Procedures**

**Recruitment of participants.** After the USF IRB approved procedures for the larger research investigation, permission was requested and granted from each of the participating school districts (three districts in Study 6 and five districts in Study 7). Parent consent forms (see Appendix F and G) were then distributed to two classes of approximately 25 students per grade level at each of the participating schools (6 schools in Study 6 and 19 schools [with 20 programs] in Study 7). The research team anticipated a response rate of approximately 50% (100 students out of the approximately 200 recruited per program at a given school), however all students who returned consent forms were able to participate in the studies. The return rate for Study 6 ranged from 42.5% to 89% across schools, with an average of 60.6%. The return rate for Study 7 ranged from 31.9% to 85.7%, with an average of 62.2%. Of note, only 0.6% of parents refused to provide consent for participation. To increase participation, incentives were provided to all schools that participated in Study 6 and Study 7. Within the three districts that permitted direct provision of incentives to student participants, students received either a pre-paid movie ticket or a \$10 iTunes gift card following completion of measures. In the other two districts, schools received a monetary donation equivalent to \$7.50 per student participant.

**Collection of student self-report data.** The procedures for the collection of student self-report data were comparable for Study 6 and Study 7. At each participating schools, the USF research team compiled a list of students who obtained written parental consent for a specific study. Students whose names were on the lists were then asked to report to a large, private space within the school (e.g., media center, cafeteria, empty classroom or conference room) during school hours. Data collection occurred between February and May 2011 across six schools for Study 6, and between March and May 2012 across 19 schools for Study 7. Students with parent



consent were also required to provide written assent prior to study participation (see Appendix H and Appendix I). A member of the research team provided students with oral instructions to complete the assent form, and also stated that students could withdraw from the study at any time, without penalty. Students who provided assent were then distributed a packet of self-report surveys assessing the constructs of interest. The packet included the CADS and StRESS, as well as numerous other surveys not analyzed in the current study. A member of the research team first read aloud items on the demographic information form, then provided direct instruction on how to complete the Likert-style survey items. Students completed the remaining measures within the packet independently. All measures administered during Study 6 and Study 7 were counter-balanced to control for order effects. After a student completed his or her survey packet, a member of the research team scanned through the packet to ensure all items were completed correctly (i.e., only one response per item); students were asked to complete missing items as necessary. Survey packets took approximately 45-60 minutes to complete for both Study 6 and Study 7.

**Collection of data from school records.** High school academic transcripts were collected for each participant during the Study 7 wave of data collection (Spring 2012). Specifically, each district provided the principal investigators with electronic files that included the following raw data: (a) titles and grades earned in each high school course taken to date, (b) performance on end-of-course IB and AP exams (course title and score), and (c) student demographic features (e.g., gender, race/ethnicity, eligibility for free or reduced-price lunch). Project research assistants combined raw data from each district into a complete dataset. Participants were identified by the same code number assigned to the individual during the collection of student self-report data.

**Longitudinal dataset creation.** To identify the students who participated in both Study 6 and Study 7, members of the research team reviewed the list of participants' names from the six schools that participated in both studies. The identities of students with matching names from a given school across the two studies were then verified using date of birth and/or state-issued student ID number. Then, participants' code numbers from each study were linked and the data from the two time points were compiled into a single, de-identified dataset for analysis.

### **Ethical Considerations**

Several precautions were taken to protect the rights of the participants in the current study. First, USF's IRB, as well as the research offices of all participating school districts, approved the larger research investigation from which Study 6 and Study 7 data were drawn. Second, all students were required to obtain written parental consent prior to study participation. Consent forms provided the parents with an explanation of the study purpose, as well as the potential risks and benefits associated with participation. Third, all students provided written assent to participate in the study prior to survey completion. During the data collection, one of the trained research team members read the student assent form aloud to ensure students understood the risks and benefits of their participation. Participants were also provided with a copy of the assent form, so that they could contact the principal investigator if they had any questions after data collection was complete. Finally, to further ensure participant confidentiality, students were instructed not to include identifying information on their survey packets. Students were instead assigned code numbers, and all data provided by participants were aggregated and analyzed using this information. Only members of the research team, as approved by USF IRB, were provided access to documents linking participants' names and code numbers.

## Overview of Analyses

**Preliminary analyses.** Means, standard deviations, and additional descriptive data (e.g., skew, kurtosis) were calculated for both the longitudinal and cross-sectional samples for StRESS and CADS factors. Correlations between the six StRESS factors, as well as the 16 CADS factors, were calculated both within a single time point and across Time 1 and Time 2. Next, a 3 (grade level) X 2 (time) X 6 (StRESS factor) ANOVA was conducted to determine if between subjects factor (grade level) should be combined with the repeated measures for further analysis. Because there was not a statistically significant 3-way interaction, grade level cohorts were combined for subsequent analyses.

Similarly, a 3 (grade level) X 2 (time) X 16 (CADS factor) ANOVA was conducted to determine if the between subjects factor (grade level) should be combined with the repeated measures for further analysis. Because there was not a statistically significant 3-way interaction, grade level cohorts were combined for subsequent analyses. Assumptions for all ANOVAs, including the independence, normality, and homogeneity of variance of the residuals were examined as part of the preliminary analyses.

Additionally, a 2 (program type) X 2 (time) X 6 (StRESS factor) ANOVA was conducted to determine if the between subjects factor (program type) should be combined with the repeated measures for further analyses. Because there was not a statistically significant 3-way interaction, program types were combined for subsequent analyses. Similarly, a 2 (program type) X 2 (time) X 16 (CADS factor) ANOVA was conducted to determine if the between subjects factor (program type) should be combined with repeated measures for further analyses. Because there was not a statistically significant 3-way interaction, program types were combined for subsequent analyses on changes in coping strategies over time.

Following preliminary analyses, a series of statistical analyses was conducted to answer the following six research questions

1. *To what extent, if any, do high-achieving students' environmental stressors change between Time 1, and one year later, at Time 2?*
2. *To what extent, if any, do high-achieving students' strategies for coping with academic demands change between Time 1, and one year later, at Time 2?*

**Differences over time.** To determine the extent to which students experience stressors to different degrees during Time 1 and one year later, at Time 2, a 2 (time) X 6 (StRESS factor) repeated measures ANOVA was conducted. Follow-up comparisons between each StRESS factor at Time 1 and 2 were then made using t-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979). The magnitude of change was then interpreted using Cohen's *d* effect sizes.

To determine the extent to which students use academic coping strategies to different degrees during Time 1 and one year later, at Time 2, a 2 (time) X 16 (CADS factor) repeated measures ANOVA was conducted. Follow-up comparisons between each CADS factor at Time 1 and 2 were then made using t-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979). The magnitude of change was then interpreted using Cohen's *d* effect sizes.

3. *Do environmental stressors experienced by high-achieving students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?*
4. *Do academic coping strategies used by high-achieving students differ according to their grade level (9<sup>th</sup>-12<sup>th</sup>)?*

**Grade level differences.** To determine if students in ninth, tenth, eleventh, and twelfth grade experience environmental stressors to different degrees, a 4 (grade level) X 6 (StRESS factor) analysis of variance (ANOVA) was conducted. Follow-up comparisons between the grade level groups (e.g., 9<sup>th</sup> vs. 10<sup>th</sup>, 9<sup>th</sup> vs. 11<sup>th</sup>, 9<sup>th</sup> vs. 12<sup>th</sup>) on each StRESS factor were then calculated using t-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979). The magnitude of change was then interpreted using Cohen's *d* effect sizes.

To determine if students in ninth, tenth, eleventh, and twelfth grade use academic coping strategies to different degrees, a 4 (grade level) X 16 (CADS factor) analysis of variance (ANOVA) was conducted. Follow-up comparisons between the grade level groups (e.g., 9<sup>th</sup> vs. 10<sup>th</sup>, 9<sup>th</sup> vs. 11<sup>th</sup>, 9<sup>th</sup> vs. 12<sup>th</sup>) on each CADS factor were then calculated using t-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979). The magnitude of change was then interpreted using Cohen's *d* effect sizes.

5. *To what extent do high-achieving high school students' environmental stressors predict their success in terms of:*

c. *Academic achievement*

d. *Life satisfaction?*

6. *To what extent do high-achieving high school students' strategies for coping with academic demands predict their success in terms of:*

e. *Academic achievement*

f. *Life satisfaction?*

**Logistic regression analyses.** To determine which environmental stressors are most uniquely predictive of students' success in terms of academic achievement and life satisfaction,

two multiple logistic regression analyses were conducted. The multiple logistic regression analyses provided for the examination of the likelihood of each environmental stressor resulting in high academic achievement (unweighted GPA  $\geq 3.0$ ) or life satisfaction (SLSS score  $\geq 4.0$ ), while controlling for the influence of other environmental stressors. The predictors that were used are below.

Likelihood of Unweighted GPA  $\geq 3.0$  = Constant + StRESS F1 (Academic Requirements) +  
StRESS F2 (Parent-Child Conflict) + StRESS F3  
(Academic and Social Struggles) + StRESS F4  
(Financial Problems) + StRESS F5 (Cultural Issues) +  
StRESS Composite Score (Major Life Events)

A review of results from the logistic regression analyses (producing a Pseudo  $R^2$ ) determined the likelihood ratio of each outcome variable (i.e., academic achievement, life satisfaction) that can be accounted for by all environmental stressors included in the model.

Similarly, to determine which academic coping strategies are most uniquely predictive of students' success in terms of academic achievement and life satisfaction, two multiple logistic regression analyses were conducted. The multiple logistic regression analyses allowed for the examination of the likelihood of each academic coping strategy resulting in high academic achievement (unweighted GPA  $\geq 3.0$ ) or life satisfaction (SLSS score  $\geq 4.0$ ), while controlling for the influence of other coping strategies. The predictors that were used are below.

Likelihood of Unweighted GPA  $\geq 3.0$  = CADS F1 (Time and Task Management) + CADS F2  
(Cognitive Reappraisal) + CADS F3 (Seek Academic  
Support) + CADS F4 (Turn to Family) + CADS F5  
(Talk with Friends and Classmates) + CADS F6 (Skip

School) + CADS F7 (Social Diversions) + CADS F8  
(Athletic Diversions) + CADS F9 (Creative Diversions)  
+ CADS F10 (Technology Diversions) + CADS F11  
(Substance Use) + CADS F12 (Reduce Effort on  
Schoolwork) + CADS F13 (Handle Problems Alone) +  
CADS F14 (Deterioration) + CADS F15 (Sleep) +  
CADS F16 (Spirituality)

A review of results from the logistic regression analyses (producing a Pseudo  $R^2$ ) determined the likelihood ratio of each outcome variable (i.e., academic achievement, life satisfaction) that can be accounted for by all academic coping strategies included in the model.

## Chapter IV: Results

This chapter includes results of the statistical analyses conducted to answer the six 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 repeated measures analysis of variance (ANOVAs) are presented to evaluate changes in students' levels of the six StRESS factors, as well as the 16 CADS factors, at time 1 and one year later, at time 2. Next, the results of a series of multivariate analysis of variance (MANOVAs) and follow-up tests are described to evaluate the differences in students' levels of the six StRESS factors, in addition to the 16 CADS factors, between 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade. Finally, the results of four multiple logistic regression analyses conducted to determine the likelihood ratio of each outcomes variable (i.e., academic achievement, life satisfaction) that can be accounted for by the six StRESS factors, as well as the 16 CADS factors, are presented.

### Data Screening

**Data entry.** Procedures for entering student self-report data were similar for Study 6 and Study 7. Raw student data were entered into a software program, Remark, through scanners by research assistants who participated in data collection throughout phases of the larger study. The datasets were then imported into SPSS, checked for entry errors, and screened for systematic errors in participants' responding. Integrity checks were initially completed for 10% of participants' survey data to ensure accuracy. When errors were detected, they were corrected in the database and surveys before and after the packet containing the error were also verified for accuracy. This process was repeated until an error-free packet was discovered. Overall, few



errors were detected and the resulting datasets analyzed in the current study are reflective of students' self-report responses.

**Missing data.** Rates of missing data were very low due to data collection procedures in which research assistants visually scanned the completed survey packets for skipped items and directed participants to complete those missed unintentionally on the spot. When data were missing on the scales analyzed in the current study (i.e., StRESS, CADS, SLSS), overall scale and factor scores were calculated and retained for analyses if they completed the specified number of cutoff items on the given scale. For the StRESS and CADS, students had to answer at least 2/3 of items within a given factor. As a result, one participant was removed from cross-sectional analyses using the Study 7 dataset for the CADS factor Substance Use, as the individual only completed 1/3 of items within this factor. All participants met or exceeded the threshold for the StRESS factors. For the SLSS, students had to answer at least five of the seven items on the scale. All participants met or exceeded this threshold for the SLSS.

### **Variable Creation**

To conduct analyses between constructs of interest, items were combined into their respective factors or composite scores on each measure (i.e., StRESS, CADS, and SLSS). Mean scores for items on each of the five StRESS factors (Academic Requirements, Parent-Child Conflict, Academic and Social Struggles, Financial Problems, and Cultural Issues) and one composite score (Major Life Events) were calculated. Similarly, means for items loading onto each of the 16 CADS factors (Time and Task Management, Cognitive Reappraisal, Seek Academic Support, Turn to Family, Talk with Friends and Classmates, Skip School, Social Diversions, Athletic Diversions, Create Diversions, Technology Diversions, Substance Use, Reduce Effort on Schoolwork, Handle Problems Alone, Deterioration, Sleep, and Spirituality)

were generated. Participants' global life satisfaction scores were calculated as the mean of participants' responses to the seven items in the SLSS (after items 3 and 4 were reverse-scored). Academic achievement scores were indexed by students' unweighted grade point average during the final semester they participated in the study (Spring 2012), calculated by awarding student the following points per course: A = 4.0, B = 3.0, C = 2.0, D = 1.0, F = 0. Therefore, GPA ranged from 0 to 4.0.

### **Preliminary Analyses**

Preliminary analyses consisted of: (a) computing Cronbach's alphas for the multi-item scales and factors, (b) computing descriptive statistics (e.g., means, standard deviations, skewness, kurtosis) for all variable of interest, (c) examining correlations between key variables (both within a single time point and across Time 1 and Time 2), (d) investigating the relationship between grade level and time through separate ANOVAs for each StRESS and CADS factor to determine if the between subjects factor (i.e., grade level) should be combined for further analyses, and (e) examining the relationship between program type and time through separate ANOVAs for each StRESS and CADS factor to determine if the between subjects factor (i.e., program type) should be combined for further analyses.

**Measure reliability.** Internal consistency was examined for all multi-item factors (i.e., StRESS, CADS) using Time 1 and 2 data from the longitudinal dataset (Study 6 and 7 overlap,  $n = 184$ ), as well as the cross-sectional dataset (entire Study 7 sample,  $n = 2,379$ ). Table 10 displays the internal consistency for all factors and scales analyzed in the current study with each of those two datasets. At Time 1, coefficient alphas for four of the five StRESS factors were considered satisfactory ( $\geq .70$ ), ranging from .66 (Academic and Social Struggles) to .87 (Academic Requirements). Similarly, at Time 2, the coefficient alphas on the StRESS ranged

from .67 (Academic and Social Struggles) to .86 (Academic Requirements). In the cross-sectional dataset, four of the five StRESS factors were also satisfactory; alphas ranged from .67 (Academic and Social Struggles) to .87 (Academic Requirements). The alpha values for the Major Life Events composite are not reported because the stressors that comprise this score do not necessarily co-occur. At Time 1, coefficient alphas for the CADS factors ranged from .44 (Seek Academic Support) to .91 (Spirituality), with 11 of the 16 factors considered satisfactory. Similarly, at Time 2, coefficient alphas ranged from .49 (Seek Academic Support) to .92 (Spirituality), and 10 of 16 factors were satisfactory. Using the cross-sectional dataset, 10 of the 16 factors were satisfactory and the coefficient alphas ranged from .54 (Seek Academic Support) to .89 (Spirituality). The internal consistency for the 7-item SLSS was also explored using the cross-sectional dataset. The coefficient alpha for this scale was satisfactory, at .87.

**Descriptive analyses.** Descriptive statistics for the variables of interest (i.e., StRESS factors, CADS factors, SLSS, GPA) are presented in Table 11. To assess univariate normality, skewness and kurtosis of the variables were calculated using longitudinal data at Time 1 and Time 2, as well as cross-sectional data. Most of the variables have an approximately normal distribution (skew and kurtosis between -2.0 and +2.0). However, two StRESS factors (Cultural Issues, Major Life Events) and one CADS factor (Substance Use) consistently demonstrated non-normal distributions (kurtosis > 3.0) across samples and time points. Caution should thus be taken when interpreting results of analyses that include these variables.

**Correlational analyses.** Pearson product-moment correlations for all continuous variables were calculated to determine the strength and nature of relationships between variables within a given time point (i.e., Time 1 with Time 1 and Time 2 with Time 2), across time points

(i.e., Time 1 with Time 2), and within the cross-sectional sample. Across-time correlations are provided in Table 12, while those calculated using cross-sectional variables are in Table 13.

Table 10

*Reliability of Student Rating of Environment Stressors Scale (StRESS) Factors, Coping with Academic Demands Scale (CADS) Factors, and Students' Life Satisfaction Scale (SLSS)*

Factor/Scale	# of items	Longitudinal Sample ( <i>n</i> = 184)		Cross-sectional Sample ( <i>n</i> = 2379)
		Time 1 <i>α</i>	Time 2 <i>α</i>	<i>α</i>
<b>StRESS</b>				
F1. Academic Requirements	13	.87	.86	.87
F2. Parent-Child Conflict	6	.79	.81	.81
F3. Academic and Social Struggles	7	.66	.67	.67
F4. Financial Problems	3	.82	.81	.77
F5. Cultural Issues	3	.76	.69	.78
Major Life Events Composite	5	.56	.58	.52
<b>CADS</b>				
F1. Time and Task Management	6	.71	.75	.74
F2. Cognitive Reappraisal	4	.75	.81	.77
F3. Seek Academic Support	3	.44	.49	.54
F4. Turn to Family	3	.77	.79	.77
F5. Talk with Friends and Classmates	4	.73	.74	.70
F6. Skip School	3	.87	.89	.85
F7. Social Diversions	3	.71	.69	.69
F8. Athletic Diversions	3	.70	.75	.75
F9. Creative Diversions	3	.60	.53	.59
F10. Technology Diversions	3	.60	.52	.57
F11. Substance Use	3	.50	.69	.67
F12. Reduce Effort on Schoolwork	4	.75	.76	.78
F13. Handle Problems Alone	4	.59	.64	.63
F14. Deterioration	6	.79	.77	.76
F15. Sleep	3	.78	.74	.70
F16. Spirituality	3	.91	.92	.89
<b>SLSS</b>				
Full Scale	7	N/A	N/A	.87

*Note.* Cross-sectional sample includes longitudinal sample at Time 2. N/A indicates data were collected and analyzed for cross-sectional sample only.

Table 11

*Descriptive Statistics for Variables of Interest*

Variable	<i>n</i>	Min.	Max.	<i>M</i>	<i>SD</i>	Skew	Kurtosis
Academic Requirements							
Time 1	184	1.54	4.92	3.55	0.72	-0.49	-0.20
Time 2	184	1.85	4.92	3.71	0.69	-0.47	-0.31
Cross-Sectional	2,379	1.00	5.00	3.58	0.73	-0.39	-0.23
Parent-Child Conflict							
Time 1	184	1.00	5.00	2.80	0.94	0.10	-0.65
Time 2	184	1.00	5.00	2.79	0.91	0.18	-0.56
Cross-Sectional	2,379	1.00	5.00	2.82	0.95	0.20	-0.69
Academic and Soc Struggles							
Time 1	184	1.00	4.29	2.05	0.62	0.88	0.80
Time 2	184	1.00	3.86	2.00	0.61	0.51	-0.32
Cross-Sectional	2,379	1.00	4.71	2.01	0.61	0.68	0.35
Financial Problems							
Time 1	184	1.00	5.00	2.37	1.06	0.67	-0.20
Time 2	184	1.00	5.00	2.51	1.14	0.49	-0.55
Cross-Sectional	2,379	1.00	5.00	2.49	1.08	0.45	-0.65
Cultural Issues							
Time 1	184	1.00	5.00	1.32	0.69	2.79	9.18
Time 2	184	1.00	3.67	1.32	0.59	2.12	4.10
Cross-Sectional	2,379	1.00	5.00	1.44	0.73	2.00	3.91
Major Life Events							
Time 1	184	1.00	4.40	1.79	0.53	1.37	3.76
Time 2	184	1.00	4.00	1.77	0.48	1.53	4.36
Cross-Sectional	2,379	1.00	5.00	1.59	0.55	1.51	3.06
Time and Task Management							
Time 1	184	1.17	4.83	3.25	0.72	-0.30	0.07
Time 2	184	1.17	5.00	3.27	0.76	-0.17	-0.06
Cross-Sectional	2,379	1.00	5.00	3.25	0.77	-0.09	-0.36
Cognitive Reappraisal							
Time 1	184	1.00	5.00	3.44	0.83	-0.26	-0.26
Time 2	184	1.00	5.00	3.59	0.83	-0.24	-0.20
Cross-Sectional	2,379	1.00	5.00	3.59	0.85	-0.35	-0.36
Seek Academic Support							
Time 1	184	1.00	4.67	2.63	0.78	0.16	-0.39
Time 2	184	1.00	4.67	2.55	0.71	0.12	0.02
Cross-Sectional	2,379	1.00	5.00	2.51	0.76	0.37	-0.05
Turn to Family							
Time 1	184	1.00	5.00	2.66	0.99	0.01	-0.80
Time 2	184	1.00	5.00	2.80	0.98	0.31	-0.75
Cross-Sectional	2,379	1.00	5.00	2.74	1.00	0.19	-0.69
Talk with Friends and Classmate							
Time 1	184	1.00	5.00	2.98	0.88	0.01	-0.53
Time 2	184	1.00	5.00	3.09	0.82	-0.23	-0.31
Cross-Sectional	2,379	1.00	5.00	3.00	0.82	-0.05	-0.32

Table 11 (Continued)

Skip School								
Time 1	184	1.00	4.67	1.57	0.84	1.75	2.78	
Time 2	184	1.00	5.00	1.68	0.82	1.20	1.26	
Cross-Sectional	2,379	1.00	5.00	1.72	0.86	1.24	1.04	
Social Diversions								
Time 1	184	1.00	5.00	3.10	0.88	-0.12	-0.76	
Time 2	184	1.00	5.00	3.19	0.89	-0.02	-0.62	
Cross-Sectional	2,379	1.00	5.00	3.18	0.91	-0.11	-0.56	
Athletic Diversions								
Time 1	184	1.00	5.00	3.02	1.06	0.19	-0.81	
Time 2	184	1.00	5.00	3.14	1.11	0.02	-1.00	
Cross-Sectional	2,379	1.00	5.00	3.14	1.15	0.06	-1.04	
Creative Diversions								
Time 1	184	1.00	5.00	2.16	0.88	0.88	0.52	
Time 2	184	1.00	5.00	2.12	0.80	0.89	1.19	
Cross-Sectional	2,379	1.00	5.00	2.27	0.91	0.75	0.20	
Technology Diversions								
Time 1	184	1.00	5.00	2.95	0.92	0.06	-0.60	
Time 2	184	1.00	5.00	3.05	0.81	0.07	-0.04	
Cross-Sectional	2,379	1.00	5.00	3.13	0.84	-0.10	-0.30	
Substance Use								
Time 1	184	1.00	3.33	1.08	0.29	4.65	25.01	
Time 2	184	1.00	4.33	1.17	0.41	3.91	21.37	
Cross-Sectional	2,379	1.00	5.00	1.17	0.43	3.66	16.51	
Reduce Effort on Schoolwork								
Time 1	184	1.00	4.00	1.88	0.73	0.80	0.15	
Time 2	184	1.00	4.25	2.07	0.75	0.53	-0.21	
Cross-Sectional	2,379	1.00	5.00	2.13	0.81	0.64	-0.03	
Handle Problems Alone								
Time 1	184	1.50	5.00	3.42	0.74	0.03	-0.19	
Time 2	184	1.25	4.75	3.31	0.74	-0.16	-0.03	
Cross-Sectional	2,379	1.00	5.00	3.34	0.76	-0.10	-0.26	
Deterioration								
Time 1	184	1.00	4.83	2.71	0.80	0.65	0.46	
Time 2	184	1.00	4.67	2.88	0.76	0.09	-0.53	
Cross-Sectional	2,379	1.00	5.00	2.80	0.79	0.18	-0.41	
Sleep								
Time 1	184	1.00	5.00	2.66	1.00	0.31	-0.60	
Time 2	184	1.00	5.00	2.67	0.96	0.15	-0.60	
Cross-Sectional	2,379	1.00	5.00	2.70	0.98	0.22	-0.60	
Spirituality								
Time 1	184	1.00	5.00	2.16	1.26	0.81	-0.56	
Time 2	184	1.00	5.00	2.17	1.27	0.79	-0.69	
Cross-Sectional	2,379	1.00	5.00	2.35	1.27	0.57	-0.91	
Life Satisfaction								
Cross-Sectional	2,379	1.00	6.00	4.26	0.96	-0.51	-0.01	
Academic Achievement								
Cross-Sectional	2,379	.86	4.00	3.40	0.50	-0.85	0.55	

With respect to the longitudinal variables, Time 1 stressors (i.e., Academic Requirements, Parent-Child Conflict, Financial Problems, Cultural Issues, Major Life Events) demonstrated small to moderate positive correlations ( $r = .12$  to  $.48$ ) with each of the other stressors within this time point. Of note, the only Time 1 stressors that did not yield statistically significant correlations were Financial Problems and Parent-Child Conflict, and Cultural Issues and Major Life Events. The strongest bivariate relationship was between Academic Requirements and Major Life Events ( $r = .48, p < .01$ ). At Time 2, each of the stressors was positively correlated with the other stressors within this time point. Notably, the strongest bivariate relationships were between Academic Requirements and Major Life Events, and Academic and Social Struggles and Parent-Child Conflict (both  $rs = .43, p < .01$ ). Additionally, Time 1 stressors were also significantly related to the same stressor at Time 2 ( $r = .43$  to  $.74, p < .01$ ). The strongest bivariate relationship was between Financial Problems at Time 1 and Time 2 ( $r = .74, p < .01$ ).

Overall, Time 1 coping strategies did not demonstrate as many significant relationships with other coping strategies within this time point, as compared with stressors. The strongest significant bivariate relationships emerged between Deterioration and Talk to Friends and Classmates ( $r = .44, p < .01$ ), Social Diversions and Talk to Friends and Classmates ( $r = .43, p < .01$ ), Time and Task Management and Cognitive Reappraisal ( $r = .43, p < .01$ ) and Seek Academic Support ( $r = .41, p < .01$ ), and Cognitive Reappraisal and Seek Academic Support ( $r = .40, p < .01$ ). The strongest inverse relationship occurred between Reduce Effort on Schoolwork and Time and Task Management ( $r = -.22, p < .01$ ). At Time 2, the strongest correlations were once again between Deterioration and Talk to Friends and Classmates ( $r = .44, p < .01$ ), Social Diversions and Talk to Friends and Classmates ( $r = .42, p < .01$ ), Time and Task Management and Cognitive Reappraisal ( $r = .37, p < .01$ ) and Seek Academic Support ( $r = .39,$

$p < .01$ ), Cognitive Reappraisal and Seek Academic Support ( $r = .40, p < .01$ ), however Turn to Family and Seek Academic Support also emerged as one of the strongest relationships ( $r = .39, p < .01$ ). Within this time point, the strongest inverse relationship occurred between Reduce Effort on Schoolwork and Time and Task Management ( $r = -.38, p < .01$ ). Moreover, Time 1 coping strategies were also positively and statistically significantly related to the same coping strategy at Time 2 ( $r = .47$  to  $.84, p < .01$ ). The strongest relationship occurred between Spirituality at both time points ( $r = .84, p < .01$ ).

Correlational analyses between stressors and coping strategies at Time 1 revealed that coping strategies including Handle Problems Alone, Deterioration, Reduce Effort on Schoolwork, Talk to Friends and Classmates, and Creative Diversions demonstrated the strongest relationship with stressors including Academic Requirements, Parent-Child Conflict, and Academic and Social Struggles ( $r = .17$  to  $.48$ ). At Time 2, coping strategies including Talk to Friends and Classmates, Skip School, Handle Problems Alone, and Deterioration were most highly correlated with stressors including Academic Requirements, Parent-Child Conflict, and Academic and Social Struggles ( $r = .16$  to  $.39$ ).

With respect to cross-sectional variables, relationships between stressors were significant, ranging from  $.17$  to  $.44$  ( $p < .01$ ), demonstrating small to moderate correlations. The strongest relationship was between Parent-Child Conflict and Academic and Social Struggles ( $r = .44, p < .01$ ). Of note, StRESS factors demonstrated small correlations with students' free or reduced price lunch status, an indicator of socioeconomic status within the current study. The correlations between stressors and lunch status were as follows:  $-.02$  (Academic Requirements),  $.01$  (Parent-Child Conflict),  $-.01$  (Academic and Social Struggles),  $.25$  (Financial Problems),  $.09$  (Cultural Issues), and  $.17$  (Major Life Events). Coping strategies yielded weak to moderate correlations



with each other, however not all relationships were statistically significant. The strongest relationship was between Time and Task Management and Cognitive Reappraisal ( $r = .46, p < .01$ ). With regard to the relationship between stressors and coping strategies, Reduce Effort on Schoolwork, Handle Problems Alone, Deterioration, Sleep, and Creative Diversions each demonstrated significant relationships with all five stressors (Academic Requirements, Parent-Child Conflict, Academic and Social Struggles, Financial Problems, and Cultural Issues) and Major Life Events ( $r = .07$  to  $.43, p < .01$ ). Life satisfaction had a significant inverse relationship with all five stressors and Major Life Events ( $r = -.18$  to  $-.40, p < .01$ ), while academic achievement was significantly related to Parent-Child Conflict ( $r = .19, p < .01$ ), Academic and Social Struggles ( $r = .13, p < .01$ ), and Financial Problems ( $r = .12, p < .01$ ) only. Additionally, life satisfaction demonstrated a significant positive relationship with coping strategies including Time and Task Management ( $r = .22, p < .01$ ), Cognitive Reappraisal ( $r = .27, p < .01$ ), and Turn to Family ( $r = .36, p < .01$ ), and an inverse relationship with strategies such as Reduce Effort on Schoolwork ( $r = -.31, p < .01$ ), Handle Problems Alone ( $r = -.33, p < .01$ ), and Deterioration ( $r = -.36, p < .01$ ). Similarly, academic achievement was positively correlated with coping strategies including Time and Task Management ( $r = .24, p < .01$ ), Cognitive Reappraisal ( $r = .11, p < .01$ ), and Turn to Family ( $r = .14, p < .01$ ), and inversely related to others such as Skip School ( $r = -.21, p < .01$ ), Reduce Effort on Schoolwork ( $r = -.37, p < .01$ ), and Substance Use ( $r = -.19, p < .01$ ).

**Comparison of grade level and program changes over time.** A mixed between-within subjects 3 (grade level) X 2 (time) X 6 (StRESS factor) ANOVA was first conducted to determine if there was a significant three-way interaction between the between subjects factor (grade level) and both within subjects factors (time, StRESS factor). The three-way interaction

was not significant, Wilks' Lambda = .91,  $F(10, 354) = 1.62$ ,  $p = .10$ . Because this preliminary analysis indicates that students did not experience significantly different changes in stressors over time according to their grade level, in subsequent analyses students from different grade levels were collapsed into a single sample, and StRESS changes were simply examined over time among the combined sample of high school youth. Similarly, a mixed between-within subjects 2 (program type [AP vs. IB] X 2 (time) X 6 (StRESS factor) ANOVA was conducted to determine if there was a significant three-way interaction between the between subjects factor (program type) and the within subjects factors (time, StRESS factor). The three-way interaction was not significant Wilks' Lambda = .95,  $F(5, 178) = 1.70$ ,  $p = .14$ , suggesting that students' changes in stressors over time did not differ significantly as a function of student program type. Therefore, in subsequent analyses students from different program types were combined into a single sample of AP/IB youth.

A mixed between-within subjects 3 (grade level) X 2 (time) X 16 (CADS factor) ANOVA was also conducted to determine if there was a significant three-way interaction between the between subjects factor (grade level) and within subjects factors (time, CADS factor). The three-way interaction was not significant, Wilks' Lambda = .88,  $F(30, 334) = .72$ ,  $p = .86$ . Thus, further analyses collapse changes in CADS factors over time across students' grade levels. Similarly, a mixed between-within 2 (program type [AP vs. IB]) X 2 (time) X 16 (CADS factor) ANOVA was conducted to determine if there was a significant three-way interaction between the between subjects factor (program type) and within subjects factors (time, CADS factor).

Table 12  
*Correlations between Variables within the Longitudinal Dataset (n = 184)*

	1	2	3	4	5	6	7	8	9	10	11
1. T1-Academic Requirements	1										
2. T1-Parent-Child Conflict	.39**	1									
3. T1-Academ & Soc Struggles	.46**	.39**	1								
4. T1-Financial Problems	.29**	.12	.32**	1							
5. T1-Cultural Issues	.33**	.29**	.33**	.15*	1						
6. T1-Major Life Events	.48**	.29**	.34**	.36**	.14	1					
7. T2-Academic Requirements	<b>.63**</b>	.28**	.28**	.14	.17*	.21**	1				
8. T2-Parent-Child Conflict	.10	<b>.62**</b>	.23**	.05	.08	.06	.33**	1			
9. T2-Academ & Soc Struggles	.14	.22**	<b>.47**</b>	.11	.08	.04	.37**	.43**	1		
10. T2-Financial Problems	.20**	.12	.29**	<b>.74**</b>	.10	.18*	.26**	.23**	.30**	1	
11. T2-Cultural Issues	.32**	.30**	.28**	.13	<b>.67**</b>	.10	.18*	.19*	.15*	.15*	1
12. T2-Major Life Events	.31**	.23**	.17*	.17*	.07	<b>.43**</b>	.43**	.31**	.26**	.26**	.03
13. T1-Time & Task Mngmt	.16*	-.17*	.06	.03	-.04	.16*	.18*	-.17*	-.06	.03	-.02
14. T1-Cognitive Reappraisal	.11	-.06	.05	.03	.09	.10	.06	-.11	-.11	-.04	.07
15. T1-Seek Academ. Supp.	.10	-.07	.07	.04	-.05	.13	.17*	.02	.01	.02	.03
16. T1-Turn to Family	.00	-.26**	-.13	-.01	-.12	-.04	.00	-.14	-.15*	-.03	-.10
17. T1-Talk Frnds & Classmates	.30**	.23**	.26**	.12	.02	.20**	.23**	.13	.18*	.12	-.02
18. T1-Skip School	.13	.10	.20**	.02	-.02	.13	.10	.08	.09	.06	-.05
19. T1-Social Diversions	.01	.09	.11	-.07	-.13	.07	.02	.18	.11	-.04	-.09
20. T1-Athletic Diversions	-.03	-.01	.09	-.02	.00	.06	-.05	.08	.09	-.05	-.02
21. T1-Creative Diversions	.24**	.22**	.24**	-.03	.14	.22**	.17*	.13	.13	.09	.10
22. T1-Tech Diversions	.09	.04	.03	.02	.05	.02	-.05	-.05	-.13	-.04	.03
23. T1-Substance Use	.07	-.03	.22**	-.03	-.07	.07	.04	.06	.13	-.02	-.04
24. T1-Reduce Eff. Schoolwork	.17*	.31**	.34**	.11	.04	.03	.06	.23**	.14	.14	.09
25. T1-Handle Probs Alone	.38**	.35**	.29**	.28**	.13	.27**	.29**	.15*	.12	.23**	.21**
26. T1-Deterioration	.48**	.33**	.31**	.22**	.01	.24**	.39**	.24**	.22**	.22**	.07
27. T1-Sleep	.07	.13	.11	.13	.01	.07	.11	.10	.06	.08	.03
28. T1-Spirituality	.07	.07	.10	.01	.14	.14	.03	.02	.00	.02	.22**

*Note.* Across-time correlations between same variables are denoted with boldface type.

\* $p < .05$ , \*\* $p < .01$

Table 12 (Continued)

	1	2	3	4	5	6	7	8	9	10	11
29. T2-Time & Task Mngmt	.08	-.12	.00	.06	-.05	.15*	.22**	-.11	-.07	.09	-.06
30. T2-Cognitive Reappraisal	.08	-.04	.02	.10	.05	.09	.14	-.08	-.04	.00	.05
31. T2-Seek Academ. Support	.01	.00	.04	-.02	-.03	.11	.06	.02	.02	-.03	-.02
32. T2-Turn to Family	-.02	-.12	-.11	-.04	-.10	-.05	-.01	-.13	-.09	-.09	-.05
33. T2-Talk Frnds & Classmates	.19**	.27**	.16*	.14	.00	.17*	.34**	.25**	.26**	.20**	-.04
34. T2-Skip School	.12	.17*	.19**	-.04	-.08	.13	.16*	.18*	.19*	.08	-.03
35. T2-Social Diversions	-.01	.15*	.21**	.03	-.08	.09	.04	.18*	.19*	.04	-.08
36. T2-Athletic Diversions	-.18*	-.05	.01	-.05	-.06	-.04	-.03	.09	.09	-.08	-.07
37. T2-Creative Diversions	.11	.09	.08	-.02	.01	.10	-.17*	.09	.06	.09	-.01
38. T2-Tech Diversions	.03	.12	.05	.04	.03	-.06	-.06	-.04	-.03	.03	.06
39. T2-Substance Use	-.03	.09	.14	-.03	-.07	-.07	-.03	.09	.28**	.05	.09
40. T2-Reduce Eff. Schoolwork	.03	.17*	.12	.05	-.05	-.08	.02	.18*	.21**	.15*	.06
41. T2-Handle Probs Alone	.05	.14	.06	.10	-.06	-.07	.22**	.23**	.13	.20**	.07
42. T2-Deterioration	.26**	.23**	.17*	.14	-.06	.08	.38**	.36**	.39**	.30**	-.02
43. T2-Sleep	.17*	.14	.07	.09	.04	.10	.20**	.08	.11	.11	.02
44. T2-Spirituality	.01	.07	.04	.03	.07	.09	.00	.08	.02	.07	.15*

Note. Across-time correlations between same variables are denoted with boldface type.

\* $p < .05$ , \*\* $p < .01$

Table 12 (Continued)

	12	13	14	15	16	17	18	19	20	21	22
12. T2-Major Life Events	1										
13. T1-Time & Task Mngmt	.15*	1									
14. T1-Cognitive Reappraisal	.10	.43**	1								
15. T1-Seek Academ. Supp.	.13	.41**	.40**	1							
16. T1-Turn to Family	.04	.24**	.33**	.29**	1						
17. T1-Talk Frnds & Classmates	.20**	.16*	.15*	.23**	.24**	1					
18. T1-Skip School	.04	-.04	.02	.06	.01	.19**	1				
19. T1-Social Diversions	.06	.14	.28**	.36**	.25**	.43**	.25**	1			
20. T1-Athletic Diversions	.06	-.06	.13	.07	.04	-.01	.09	.28**	1		
21. T1-Creative Diversions	.30**	.17*	.12	.21**	.03	.18*	.05	.01	.07	1	
22. T1-Tech Diversions	-.07	-.01	.12	-.05	.14	.09	.07	.18*	-.11	-.04	1
23. T1-Substance Use	.22**	.02	.13	.07	.05	.11	.25**	.25**	.16*	.11	.02
24. T1-Reduce Eff. Schoolwork	-.01	-.22**	-.10	-.08	-.07	.14	.36**	.06	-.08	.09	.18
25. T1-Handle Probs Alone	.15*	.00	-.03	-.01	.26**	.01	-.01	-.12	-.08	.12	.05
26. T1-Deterioration	.25**	.10	-.05	.11	.07	.44**	.23**	.07	-.14	.21**	.09
27. T1-Sleep	-.01	-.07	.21**	.12	.06	.17*	.33**	.30**	.08	.01	.13
28. T1-Spirituality	.10	.13	.09	.21*	.19**	.23	.10	.18*	.18*	.21**	-.09
29. T2-Time & Task Mngmt	.24**	<b>.65**</b>	.29**	.26**	.17*	.09	.02	.11	-.10	.16*	-.14
30. T2-Cognitive Reappraisal	.18*	.21**	<b>.53**</b>	.21**	.16*	.06	-.01	.17*	.22**	.04	.07
31. T2-Seek Acad. Support	.17*	.26**	.30**	<b>.48**</b>	.14	.12	.18*	.29**	.22**	.24**	-.20**
32. T2-Turn to Family	.01	.22**	.20**	.19**	<b>.57**</b>	.19*	.02	.26**	.15*	.02	.01
33. T2-Talk Frnds & Classmates	.32**	.12	.09	.26**	.24**	<b>.48**</b>	.13	.27**	.01	.20**	-.12
34. T2-Skip School	.07	-.10	.03	.12	-.01	.25**	<b>.65**</b>	.31**	.07	.01	.06
35. T2-Social Diversions	.18*	.05	.15*	.23**	.12	.31**	.21**	<b>.66**</b>	.24**	.06	.10
36. T2-Athletic Diversions	.01	-.07	.14	.00	.04	-.06	.08	.18*	<b>.74**</b>	.01	-.11
37. T2-Creative Diversions	.29**	.18*	.10	.24**	.08	.15*	-.01	-.02	.03	<b>.65**</b>	-.11
38. T2-Tech Diversions	-.06	-.14	.03	-.12	-.08	.01	-.01	-.02	-.14	-.05	<b>.67**</b>
39. T2-Substance Use	.04	-.11	.03	-.12	-.05	.02	.10	.18*	.21**	.01	.02
40. T2-Reduce Eff. Schoolwork	-.09	-.31**	-.22**	-.09	-.08	.01	.16*	-.01	.02	-.02	.07
41. T2-Handle Probs Alone	.10	-.11	-.18*	-.07	-.25**	-.07	-.04	-.16*	-.12	.01	.04
42. T2-Deterioration	.23**	-.09	-.20**	-.05	.05	.31**	.12	.03	-.11	.12	.07
43. T2-Sleep	.09	-.12	.18*	.11	.04	.07	.24**	.17*	.04	.00	-.01
44. T2-Spirituality	.10	.07	.07	.14	.15*	.17*	.05	.13	.19*	.20**	-.21**

Note. Across-time correlations between same variables are denoted with boldface type.

\* $p < .05$ , \*\* $p < .01$

Table 12 (Continued)

	23	24	25	26	27	28	29	30	31	32	33
23. T1-Substance Use	1										
24. T1-Reduce Eff. Schoolwork	.13	1									
25. T1-Handle Probs Alone	.02	.24**	1								
26. T1-Deterioration	.05	.35**	.35**	1							
27. T1-Sleep	.16*	.31**	.15*	.17*	1						
28. T1-Spirituality	.02	.13	.06	.13	.26**	1					
29. T2-Time & Task Mngmt	.06	-.19*	-.01	.02	-.09	.19*	1				
30. T2-Cognitive Reappraisal	.09	-.18*	-.04	-.11	.09	.07	.37**	1			
31. T2-Seek Academ. Support	.19**	-.08	-.06	.05	.15*	.19**	.39**	.27**	1		
32. T2-Turn to Family	.00	-.12	-.20**	.07	.06	.27**	.31**	.26**	.39**	1	
33. T2-Talk Frnds & Classmates	.09	.15*	-.02	.36**	.13	.17*	.22**	.13	.27**	.36**	1
34. T2-Skip School	.11	.35**	-.01	.18*	.25**	.16*	.05	.01	.21	.03	.24**
35. T2-Social Diversions	.23	.18*	-.07	.10	.27**	.15*	.15*	.28**	.36**	.30**	.42**
36. T2-Athletic Diversions	.12	-.06	-.12	-.20**	.10	.14	-.04	.34**	.24**	.19*	.04
37. T2-Creative Diversions	.04	-.02	.02	.15*	-.01	.10	.22**	.18*	.33**	.07	.17*
38. T2-Tech Diversions	-.01	.19*	.05	.07	.06	-.10	-.15*	.04	-.05	.01	-.07
39. T2-Substance Use	<b>.47**</b>	.02	-.03	.06	.09	.03	-.12	.03	.06	.07	.01
40. T2-Reduce Eff. Schoolwork	-.02	<b>.52**</b>	.18*	.19*	.12	.05	-.38**	-.22**	-.22**	-.17*	.02
41. T2-Handle Probs Alone	-.01	.10	<b>.55**</b>	.12	.01	-.02	-.07	-.01	-.21**	-.36**	-.12
42. T2-Deterioration	.07	.21**	.18*	<b>.59**</b>	.09	-.02	-.02	-.22**	-.08	.00	.44**
43. T2-Sleep	.15*	.25**	.24**	.12	<b>.62**</b>	.13	-.04	.09	.12	.11	.18*
44. T2-Spirituality	.01	.08	.04	.10	.19*	<b>.84**</b>	.20**	.09	.22**	.27**	.22**

Note. Across-time correlations between same variables are denoted with boldface type.

\* $p < .05$ , \*\* $p < .01$

Table 12 (Continued)

	34	35	36	37	38	39	40	41	42	43	44
34. T2-Skip School	1										
35. T2-Social Diversions	<b>.36**</b>	1									
36. T2-Athletic Diversions	.07	<b>.28**</b>	1								
37. T2-Creative Diversions	-.01	.12	.10	1							
38. T2-Tech Diversions	.12	.11	-.04	-.01	1						
39. T2-Substance Use	.14	.18*	<b>.20**</b>	-.04	.12	1					
40. T2-Reduce Eff. Schoolwork	<b>.31**</b>	.09	-.01	-.04	.18*	.19*	1				
41. T2-Handle Probs Alone	-.02	-.12	-.09	.06	.13	-.02	<b>.24**</b>	1			
42. T2-Deterioration	<b>.22**</b>	.08	-.15*	.07	.10	.10	<b>.25**</b>	<b>.21**</b>	1		
43. T2-Sleep	<b>.31**</b>	<b>.25**</b>	.09	-.06	.08	.16*	<b>.26**</b>	.10	.11	1	
44. T2-Spirituality	<b>.20**</b>	.15*	<b>.26**</b>	.16*	-.08	.06	.05	-.05	.02	.12	1

Note. Across-time correlations between same variables are denoted with boldface type.

\* $p < .05$ , \*\* $p < .01$

Table 13

*Correlations between Variables within the Cross-sectional Dataset (n = 2,379)*

	1	2	3	4	5	6	7	8	9	10	11	12
1. Academic Requirements	1											
2. Parent-Child Conflict	.44**	1										
3. Academic & Soc. Struggles	.39**	.43**	1									
4. Financial Problems	.33**	.31**	.37**	1								
5. Cultural Issues	.20**	.24**	.25**	.17**	1							
6. Major Life Events	.19**	.22**	.31**	.36**	.18**	1						
7. Time & Task Management	.17*	-.12**	-.13**	-.01	-.02	.01	1					
8. Cognitive Reappraisal	.07**	-.09**	-.07**	.01	.04*	.03*	.46**	1				
9. Seek Academ. Support	.13**	.04*	.02	-.02	.06**	.06**	.38**	.32**	1			
10. Turn to Family	.03	-.22**	-.10**	-.12**	-.04*	-.04	.31**	.31**	.30**	1		
11. Talk Friends & Classmates	.29**	.18**	.25**	.13**	.04	.09**	.15**	.13**	.28**	.29**	1	
12. Skip School	.15**	.08*	.24**	.17**	.02	.20**	-.10**	-.03	.02	.03	.17**	1
13. Social Diversions	.08**	.14**	.20**	.01	-.02	.07**	.11**	.22**	.29**	.24**	.41**	.19**
14. Athletic Diversions	.11**	.04*	.09**	-.06**	-.05*	-.01	.15**	.26**	.25**	.20**	.12**	-.05*
15. Creative Diversions	.10**	.16**	.13**	.12**	.12**	.20**	.12**	.16**	.18**	.09**	.19**	.06**
16. Technology Diversions	-.03	.10**	.02	.02	.06**	-.03	-.13**	.02	.00	-.01	.08**	.04*
17. Substance Use	.04*	.14**	.29**	.14**	.04	.12**	-.10*	-.02	.00	-.10**	.07**	.24**
18. Reduce Eff. Schoolwork	.15**	.29**	.36**	.21**	.09**	.13**	-.41**	-.26**	-.14**	-.19**	.14**	.35**
19. Handle Probs Alone	.19**	.25**	.14**	.20**	.10**	.14**	-.06**	-.01	-.15**	-.32**	-.15**	.01
20. Deterioration	.43**	.37**	.39**	.29**	.16**	.21**	-.05*	-.11**	.02	.02	.37**	.20**
21. Sleep	.15**	.13**	.18**	.10**	.07**	.08**	-.04	.09**	.11**	.07**	.21**	.29**
22. Spirituality	.03	.00	.01	.03	.15**	.08**	.19**	.24**	.21**	.26**	.11**	.00
23. Life Satisfaction	-.21**	-.38**	-.29**	-.40**	-.18**	-.27**	.22**	.27**	.14**	.36**	-.01	-.11**
24. Academic Achievement	.01	-.19**	-.13**	-.12**	-.01	-.17**	.24**	.11**	.03	.14**	.00	-.21**

Note. \* $p < .05$ , \*\* $p < .01$



Table 13 (Continued)

	13	14	15	16	17	18	19	20	21	22	23	24
13. Social Diversions	1											
14. Athletic Diversions	.32**	1										
15. Creative Diversions	.19**	.09**	1									
16. Technology Diversions	.22**	-.03	.12**	1								
17. Substance Use	.20**	.07**	.08**	.02	1							
18. Reduce Eff. Schoolwork	.12**	-.05*	.06**	.17**	.25**	1						
19. Handle Probs Alone	-.12**	-.09**	.12**	.05*	.08**	.23**	1					
20. Deterioration	.13**	-.07**	.15**	.13**	.15**	.38**	.28**	1				
21. Sleep	.26**	.02	.11**	.15**	.13**	.30**	.04*	.21**	1			
22. Spirituality	.17**	.18**	.15**	-.03	-.04*	-.07**	-.06**	.03	.09**	1		
23. Life Satisfaction	.13**	.23**	-.11**	-.08**	-.11**	-.31**	-.33**	-.36**	-.08**	.08**	1	
24. Academic Achievement	-.11**	.03	-.09**	-.09**	-.19**	-.37**	-.13**	-.07*	-.07**	-.01	.19**	1

Note. \* $p < .05$ , \*\* $p < .01$

Results revealed that this three-way interaction was also not significant, Wilks' Lambda = .93,  $F(15, 168) = .89, p = .57$ , thus changes in coping strategies over time did not vary significantly as a function of whether students were in AP or IB programs. Further analyses thus collapse changes in CADS factors over time across program types.

### **Analysis of Differences Over Time**

A 2 (time) X 6 (StRESS factor) repeated measures ANOVA was conducted to determine the extent to which high achieving students' levels of various environmental stressors changed between Time 1 (when participants were in grades 9, 10, or 11) and one year later, at Time 2 (when participants were in grades 10, 11, or 12). A parallel 2 (time) X 16 (CADS factor) repeated measures ANOVA was conducted to identify the extent to which high achieving students' use of various academic coping strategies changed between Time 1 and one year later, at Time 2.

**Changes in environmental stressors over time.** A 2 (time) X 6 (StRESS factor) repeated measures ANOVA was conducted to detect the changes in students' environmental stressors over time. Follow-up comparisons were made using paired *t*-tests to determine the change in each StRESS factor between Time 1 and one year later, at Time 2. The analysis revealed that there was a significant interaction between time and StRESS factor,  $F(5, 179) = 5.71, p < .001$ , partial eta squared = .138, indicating that students experienced a significant change in levels of environmental stressors over time. A significant main effect was not found for time,  $F(1, 183) = 1.51, p = .22$ , partial eta squared = .01. To further investigate the significant interaction, post-hoc comparisons were made using paired *t*-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979; see Table 14). Analyses revealed that students experienced a statistically significant increase in stress due to

Academic Requirements between Time 1 and Time 2,  $t(183) = -3.43, p < .01$ . However, the magnitude of this change was small,  $d = 0.25$ . The trend towards significant increases in stress pertinent to financial problems over time was not statistically significant when the modified Bonferroni procedure was applied. The other four sources of stress stayed fairly constant across the 1-year interval.

Table 14

*Change in Mean Levels of Environmental Stressors Over Time (n = 184)*

StRESS Factor	Time 1		Time 2		<i>t</i>	<i>p</i>	<i>α</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Academic Requirements	3.55	0.72	3.71	.69	-3.43*	.001	.008	0.25
Parent-Child Conflict	2.80	0.94	2.80	.91	0.02	.986	.050	0.01
Academic & Social Struggles	2.05	0.62	2.00	.61	1.12	.266	.013	0.08
Financial Problems	2.37	1.06	2.51	1.13	-2.48	.014	.010	0.18
Cultural Issues	1.32	0.69	1.32	.59	0.09	.926	.025	0.01
Major Life Events	1.79	0.53	1.77	.43	0.35	.729	.017	0.03

*Note.* \*Significant *p*-value based on comparison with the adjusted alpha value, specified in column for *α* in above table.

**Changes in academic coping strategies over time.** A 2 (time) X 16 (CADS factor) repeated measures ANOVA was conducted to detect the changes in students' levels of various academic coping strategies over time. This analysis revealed that there was a significant interaction between time and CADS factor,  $F(15, 169) = 2.88, p < .01$ , partial eta squared = .20, indicating that students experienced significant changes in their use of coping strategies between time points. There was also a statistically significant main effect of time,  $F(1, 183) = 10.63, p < .01$ , partial eta squared = .06, with the average usage across CADS factors increasing between time 1 and 2, however this effect should be interpreted with caution given the significant

interaction. To further explore the source of the significant interaction, post-hoc comparisons were made using paired t-tests, with alpha values modified to control for type I error using a modified Bonferroni procedure (Holm, 1979; see Table 15), to determine the change in each CADS factor between Time 1 and one year later, at Time 2. Analyses revealed that as students aged, they experienced a statistically significant increase in the frequency with which they responded to academic stressors by using three types of coping strategies, specifically Substance Use,  $t(183) = -2.98, p < .01$ , Reduce Effort on Schoolwork,  $t(183) = -3.52, p < .01$ , and Deterioration,  $t(183) = -3.35, p < .01$ . The magnitude of such changes were small,  $d = .25$  to  $.26$ . The trend towards significant increases in coping with academic demands by turning to family, skipping school, and engaging in athletic diversions were not statistically significant when the modified Bonferroni procedure was employed.

### **Cross-sectional Grade Level Differences in Stress and Coping**

To determine if students in 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade experience differential levels of environmental stressors and reliance on academic coping strategies, a series of two separate MANOVAs were conducted. This omnibus multivariate analysis was selected to adjust for the increased risk of Type I error that results from conducting multiple univariate analyses. Moreover, this analysis allows for the exploration of differences between students within distinct grade levels on a combination of dependent variables, including stressors and strategies to cope with academic demands. The first MANOVA included the 6 StRESS factors as dependent variables, while the second included the 16 CADS factors as dependent variables. An alpha value of .05 was used to determine statistical significance. Significant MANOVAs were followed by univariate ANOVAs to determine the specific stressors and coping strategies in which students across grade levels differed. Post-hoc comparisons were then made using Tukey tests to

determine which grade levels differed from each other on a particular stressor or academic coping strategy. With respect to all follow-up analyses, a modified Bonferroni adjustment procedure was utilized to control for type I error by using more stringent alpha values (Holm, 1979).

Table 15

*Change in Mean Levels of Academic Coping Strategies Over Time (n = 184)*

CADS Factor	Time 1		Time 2		<i>t</i>	<i>p</i>	<i>α</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Time & Task Management	3.25	0.72	3.27	0.76	-0.43	.668	.013	0.03
Cognitive Reappraisal	3.44	0.83	3.59	0.83	-2.56	.011	.004	0.19
Seek Academic Support	2.63	0.78	2.55	0.71	1.45	.148	.008	0.11
Turn to Family	2.66	0.99	2.80	0.98	-2.10	.038	.005	0.16
Talk to Classmate & Friends	2.98	0.88	3.09	0.82	-1.82	.070	.006	0.13
Skip School	1.57	0.84	1.68	0.82	-2.25	.026	.004	0.17
Social Diversions	3.10	0.88	3.19	0.89	-1.69	.093	.007	0.12
Athletic Diversions	3.02	1.06	3.14	1.11	-2.01	.046	.005	0.15
Creative Diversions	2.16	0.88	2.12	0.80	0.90	.371	.010	0.06
Tech. Diversions	2.95	0.92	3.05	0.81	-1.91	.058	.006	0.14
Substance Use	1.08	0.29	1.17	0.41	-2.98*	.003	.004	0.25
Reduce Effort Schoolwork	1.88	0.73	2.07	0.75	-3.52*	.001	.003	0.26
Handle Problems Alone	3.32	0.74	3.31	0.74	0.10	.923	.025	0.01
Deterioration	2.71	0.80	2.88	0.76	-3.35*	.001	.003	0.25
Sleep	2.66	1.00	2.67	0.96	-0.17	.864	.017	0.01
Spirituality	2.16	1.26	2.17	1.27	-0.05	.959	.050	0.01

*Note.* \* Significant *p*-value based on adjusted alpha.

**Assumptions.** All assumptions of MANOVA were explored prior to conducting analyses to determine if this omnibus analysis was an appropriate method to answer the research

questions. Sampling was first considered to determine if the assumption of independence of observations was met. Although students were clustered within 19 schools and therefore responses were not truly independent, the sample was drawn from a well-defined population (high school students in accelerated academic curricula) and the sample was large ( $n = 2,379$ ), thus the assumption of independence of observation vectors is not a significant concern. To assess normality of the data, skewness and kurtosis, as well as univariate and multivariate outliers for the overall sample, were observed during data screening. Evidence of higher than desirable skew or kurtosis values is not considered to be a significant concern, as the large sample size will allow for robust results despite non-normality (Tabachnick & Fidell, 2013). To evaluate the assumption of linearity, matrices of scatterplots between variables were examined for each grade level (9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup>). The plots did not show any obvious evidence of non-linearity, thus the assumption of linearity was satisfied. Box's M test of equality was used to test the homogeneity of variance-covariance matrices. Significant Box's M statistics indicate that this assumption was violated, such that there is unequal covariance for both the StrESS factors (Box's M = 127.76,  $F(63, 12846199) = 2.02, p < .001$ ) and CADS factors (Box's M = 693.81,  $F(408, 11586861) = 1.68, p < .001$ ). However, Tabachnick and Fidell (2013) warn that Box's M may be too strict with large samples, as this statistic is sensitive to violations of normality and more robust violations may occur when the sample size in each group is large. Although MANOVA is considered an appropriate statistical procedure for the research questions, the violation of assumptions (normality, homogeneity of variance-covariance matrices) suggest that caution should be taken when interpreting the results of the current study.

**MANOVA results.** Results of the multivariate analysis of variance (MANOVA) are reported separately for students' environmental stressors, as indicated by the StRESS factors, and

coping strategies to manage academic demands, as measured by the CADS. Grade level means and standard deviations for each StRESS and CADS factor are presented following MANOVA results.

***Grade level differences in environmental stressors.*** A one-way between-groups MANOVA was performed to investigate the extent to which students in 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade levels experience different levels of environmental stressors. The six dependent variables are represented by each StRESS factor (Academic Requirements, Parent-Child Conflict, Academic and Social Struggles, Financial Problems, Cultural Issues) and single composite (Major Life Events). The independent variable was grade level (9<sup>th</sup>-12<sup>th</sup>). The multivariate analysis of combined StRESS variables yielded statistically significant differences between grade levels, Wilks' lambda = .91,  $F(18, 6704) = 13.22$ ,  $p < .001$ , partial eta squared = .03.

Given the significance of the multivariate analysis, univariate main effects were explored. Significant main effects were found using a modified Bonferroni procedure (Holm, 1979) for Academic Requirements,  $F(3, 2375) = 23.13$ ,  $p < .001$  (adjusted alpha = .008), partial eta squared = .03, Parent-Child Conflict,  $F(3, 2375) = 6.95$ ,  $p < .001$  (adjusted alpha = .01), partial eta squared = .01, Academic and Social Struggles,  $F(3, 2375) = 12.17$ ,  $p < .001$  (adjusted alpha = .013), partial eta squared = .02, and Financial Problems,  $F(3, 2375) = 25.37$ ,  $p < .001$  (adjusted alpha = .017), partial eta squared = .03. Tukey post-hoc analyses consisted of conducting pairwise comparisons with each grade level. Each comparison was tested using the modified Bonferroni adjustment (see Table 16). Results indicate that students in 9<sup>th</sup> grade experienced significantly less stress due to academic requirements than those in 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade. Regarding stress due to parent-child conflict, 12<sup>th</sup> grade students experienced significantly less stress than students in 10<sup>th</sup>, and 11<sup>th</sup> grade. Students in 9<sup>th</sup> grade also experienced less stress than

those in 11<sup>th</sup> and 12<sup>th</sup> grade in the domain of academic and social struggles, while 9<sup>th</sup> and 10<sup>th</sup> grade students reported less stress with financial issues than 11<sup>th</sup> and 12<sup>th</sup> grade students.

***Grade level differences in academic coping strategies.*** A one-way between-groups MANOVA was conducted to explore the extent to which student in 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade differentially rely on various coping strategies to manage academic demands. The dependent variables included the 16 CADS factors (Time and Task Management, Cognitive Reappraisal, Seek Academic Support, Turn to Family, Talk with Friends and Classmates, Skip School, Social Diversions, Athletic Diversions, Create Diversions, Technology Diversions, Substance Use, Reduce Effort on Schoolwork, Handle Problems Alone, Deterioration, Sleep, and Spirituality). The independent variable was grade level (9<sup>th</sup>-12<sup>th</sup>). The multivariate analysis of combined CADS variables yielded statistically significant differences between grade levels, Wilks' lambda = .89,  $F(48, 7020) = 6.06, p < .001$ , partial eta squared = .04.

Because the multivariate analysis was statistically significant, univariate main effects were investigated. Significant main effects were found using a modified Bonferroni procedure (Holm, 1979) for the following CADS factors: Seek Academic Support,  $F(3, 2375) = 5.22, p = .001$  (adjusted alpha = .005), partial eta squared = .007; Skip School,  $F(3, 2375) = 37.12, p < .001$  (adjusted alpha = .003), partial eta squared = .045; Athletic Diversions,  $F(3, 2375) = 4.94, p = .001$  (adjusted alpha = .006), partial eta squared = .006; Creative Diversions,  $F(3, 2375) = 11.87, p < .001$  (adjusted alpha = .003), partial eta squared = .015; Substance Use,  $F(3, 2375) = 11.67, p < .001$  (adjusted alpha = .004), partial eta squared = .015; Reduce Effort on Schoolwork,  $F(3, 2375) = 11.78, p < .001$  (adjusted alpha = .004), partial eta squared = .015; Sleep,  $F(3, 2375) = 10.09, p < .001$  (adjusted alpha = .004), partial eta squared = .013; and Spirituality,  $F(3, 2375) = 6.46, p < .001$  (adjusted alpha = .005), partial eta squared = .008. Tukey post-hoc



analyses consisted of conducting pairwise comparisons with each grade level. Each comparison was tested using the modified Bonferroni adjustment (see Table 17). Analyses revealed that 10<sup>th</sup> grade students relied on Seeking Academic Support significantly more than 12<sup>th</sup> grade students. Students in 12<sup>th</sup> grade used Skipping School as an academic coping strategy significantly more than students in 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade, while 11<sup>th</sup> grade students relied on this coping strategy significantly more than those in 9<sup>th</sup> and 10<sup>th</sup> grade. Students in 12<sup>th</sup> grade used Athletic Diversions to cope with academic demands significantly less than those in 10<sup>th</sup> and 11<sup>th</sup> grade. With respect to Creative Diversions, students in 9<sup>th</sup> grade used this strategy significantly more than those in 11<sup>th</sup> and 12<sup>th</sup> grade, while 10<sup>th</sup> graders relied on Creative Diversions significantly more than 11<sup>th</sup> graders. Students in 12<sup>th</sup> grade relied on Substance Use significantly more than 9<sup>th</sup> and 10<sup>th</sup> grade students, while 11<sup>th</sup> grade students used this strategy significantly more than 9<sup>th</sup> grade students only. Regarding Reduced Effort on Schoolwork and Sleep, 9<sup>th</sup> grade students employed these strategies significantly less than those in 11<sup>th</sup> and 12<sup>th</sup> grade. Finally, 10<sup>th</sup> grade students relied on Spirituality significantly more than 11<sup>th</sup> and 12<sup>th</sup> grade students.

### **Stress and Coping as Predictors of Student Success**

To determine the extent to which students' environmental stressors and academic coping strategies predict their success in terms of academic achievement and life satisfaction, a series of four logistic regression analyses were conducted using the cross-sectional sample ( $n = 2,379$ ). This dataset was selected for regression analyses because the larger sample size yields greater power. This statistical approach was selected as it provides an indication of the relative importance of each predictor variable (StRESS and CADS factors), as well as an estimate of how well the set of predictor variables predicts the dichotomous dependent variables (GPA and average SLSS score).

Table 16

*Grade Level Means and Standard Deviations on Environmental Stressors (n = 2,379)*

StRESS Factor	<i>F</i>	<i>p</i>	9 <sup>th</sup> ( <i>n</i> = 604)		10 <sup>th</sup> ( <i>n</i> = 644)		11 <sup>th</sup> ( <i>n</i> = 593)		12 <sup>th</sup> ( <i>n</i> = 538)	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Academic Requirements	23.13	<.001	3.37	0.73	3.62 <sup>a</sup>	0.70	3.69 <sup>a</sup>	0.73	3.63 <sup>a</sup>	0.73
Parent-Child Conflict	6.95	<.001	2.83	1.01	2.91 <sup>d</sup>	0.92	2.87 <sup>d</sup>	0.97	2.67	0.88
Academic & Social Struggles	12.17	<.001	1.89	0.60	2.00	0.62	2.08 <sup>a</sup>	0.61	2.07 <sup>a</sup>	0.57
Financial Problems	25.37	<.001	2.25	1.00	2.39	1.05	2.66 <sup>a,b</sup>	1.15	2.71 <sup>a,b</sup>	1.07
Cultural Issues	3.05	.027	1.43	0.74	1.51	0.79	1.40	0.73	1.42	0.67
Major Life Events	1.38	.246	1.59	0.54	1.59	0.56	1.62	0.57	1.55	0.54

*Note.* <sup>a</sup>Grade level mean significantly higher than 9<sup>th</sup> grade, <sup>b</sup>Grade level mean significantly higher than 10<sup>th</sup> grade, <sup>c</sup>Grade level mean significantly higher than 11<sup>th</sup> grade, <sup>d</sup>Grade level mean significantly higher than 12<sup>th</sup> grade.

Table 17

*Grade Level Means and Standard Deviations on Academic Coping Strategies (n = 2,379)*

CADS Factor	<i>F</i>	<i>p</i>	9 <sup>th</sup> ( <i>n</i> = 604)		10 <sup>th</sup> ( <i>n</i> = 644)		11 <sup>th</sup> ( <i>n</i> = 593)		12 <sup>th</sup> ( <i>n</i> = 538)	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Time & Task Management	1.82	.141	3.23	0.77	3.31	0.76	3.26	0.77	3.20	0.79
Cognitive Reappraisal	2.59	.052	3.51	0.89	3.63	0.86	3.62	0.82	3.59	0.83
Seek Academic Support	5.22	.001	2.55	0.78	2.58 <sup>d</sup>	0.78	2.50	0.76	2.41	0.71
Turn to Family	1.34	.259	2.73	1.00	2.80	0.99	2.69	0.99	2.72	1.02
Talk to Class & Friends	2.51	.057	2.92	0.81	3.03	0.83	3.03	0.84	3.02	0.80
Skip School	37.12	<.001	1.51	0.74	1.62	0.80	1.78 <sup>a,b</sup>	0.88	2.00 <sup>a,b,c</sup>	0.95
Social Diversions	.44	.723	3.20	0.95	3.20	0.92	3.20	0.92	3.14	0.87
Athletic Diversions	4.94	.002	3.13	1.20	3.21 <sup>d</sup>	1.14	3.22 <sup>d</sup>	1.19	2.99	1.05
Creative Diversions	11.87	<.001	2.41 <sup>c,d</sup>	0.97	2.34 <sup>c</sup>	0.90	2.13	0.88	2.20	0.84
Tech. Diversions	1.34	.260	3.19	0.84	3.12	0.84	3.13	0.85	3.10	0.80
Substance Use	11.67	<.001	1.11	0.35	1.15	0.40	1.19 <sup>a</sup>	0.45	1.25 <sup>a,b</sup>	0.51
Reduce Effort Schoolwork	11.78	<.001	1.99	0.80	2.10	0.77	2.18 <sup>a</sup>	0.84	2.25 <sup>a</sup>	0.80
Handle Problems Alone	2.73	.042	3.27	0.80	3.33	0.78	3.39	0.75	3.36	0.71
Deterioration	2.19	.087	2.73	0.81	2.83	0.79	2.83	0.79	2.79	0.76
Sleep	10.09	<.001	2.55	0.96	2.65	0.98	2.78 <sup>a</sup>	1.00	2.83 <sup>a</sup>	0.95
Spirituality	6.46	<.001	2.42	1.26	2.48 <sup>c,d</sup>	1.30	2.23	1.27	2.23	1.22

*Note.* <sup>a</sup>Grade level mean significantly higher than 9<sup>th</sup> grade, <sup>b</sup> Grade level mean significantly higher than 10<sup>th</sup> grade, <sup>c</sup>Grade level mean significantly higher than 11<sup>th</sup> grade, <sup>d</sup>Grade level mean significantly higher than 12<sup>th</sup> grade

Prior to analyses, the continuous variable represented by life satisfaction score was recoded as a dummy variable (average life satisfaction  $< 4.00 = 0$ ; average life satisfaction score  $\geq 4.0 = 1$ ), consistent with prior research distinguishing between youth who are satisfied vs. dissatisfied with life (Suldo & Huebner, 2004). Similarly, the continuous variable for achievement represented by current GPA was recoded as a dummy variable (GPA  $< 3.00 = 0$ ; GPA  $\geq 3.00 = 1$ ), in accordance with benchmarks commonly associated with student success among students in accelerated academic program (i.e., AP and IB). The first logistic regression analysis included the six StRESS factors as independent variables and academic achievement (GPA) as the dichotomous dependent variable, while second included the same set of independent predictor variables and life satisfaction (SLSS score) as the dichotomous dependent variable. The third and fourth logistic regression analyses included the 16 CADS factors as independent variables, while also using academic achievement (GPA), and life satisfaction (SLSS score) as dichotomous dependent variables, respectively.

**Predicting student success from environmental stressors.** Logistic regression analyses were used to determine the extent to which environmental stressors predict students' success in terms of both academic achievement and life satisfaction (see Tables 18 and 19). The six predictors in both analyses are represented by each StRESS factor (Academic Requirements, Parent-Child Conflict, Academic and Social Struggles, Financial Problems, Cultural Issues) and single composite (Major Life Events). The outcome variables included the dummy-coded variables for GPA and average score on the SLSS, separately. For each regression analysis, the full model chi-square value, indicating whether or not the model was able to distinguish between participants who were and were not successful (according to GPA and life satisfaction), and pseudo *R* square values, representing the variance explained by the set of predictors in the model

are interpreted. Additionally, the percentage of cases correctly classified, indicating how well the model is able to predict the correct category (successful/unsuccessful for GPA and life satisfaction), and odds-ratios, representing the change in odds of being successful or unsuccessful when the value of the predictor increases by one unit (Tabachnick & Fidell, 2013) are discussed.

**GPA.** The full model containing all predictor variables was statistically significant,  $\chi^2(6, N = 2,370) = 104.79, p < .001$ , indicating that the model was able to distinguish between students who were and were not academically successful. The model as a whole explained between 4.30% (Cox and Snell R Square) and 6.50% (Nagelkerke R squared) of the variance in academic achievement, and correctly classified 75.70% of cases. Four of the independent variables made a unique statistically significant contribution ( $p < .05$ ) to the model (Academic Requirements, Parent-Child Conflict, Financial Problems, and Major Life Events). The strongest predictor of academic achievement was stress due to academic requirements, recording an odds ratio of 1.53. This indicated that students who experienced stress due to academic requirements were 1.53 times *more* likely to be academically successful than those who did not experience stress within this domain. The odds ratios for parent-child conflict, financial problems, and major life events, which are less than 1, indicate that for every additional point students endorsed on the StRESS for these factors, students were .66, .89, and .69 times *less* likely to achieve academic success while controlling for other stressors, respectively.

**Life satisfaction.** The full model containing all predictors was statistically significant,  $\chi^2(6, N = 2,379) = 438.31, p < .001$ , indicating that the model was able to distinguish between students who were and were not satisfied with life. The model as a whole explained between 16.80% (Cox and Snell R Square) and 23.40% (Nagelkerke R squared) of the variance in life

satisfaction, and correctly classified 72.80% of cases. Five of the independent variables made a unique statistically significant contribution ( $p < .05$ ) to the model (Parent-Child Conflict, Academic and Social Struggles, Financial Problems, Cultural Issues, and Major Life Events).

Table 18

*Logistic Regression Predicting Likelihood of High Academic Achievement from Environmental Stressors (n = 2,370)*

StRESS Factor	<i>B</i>	S.E.	Wald	Odds ratio	<i>p</i>
Academic Requirements	0.42	.08	27.73	1.53**	<.001
Parent-Child Conflict	-0.41	.06	44.79	0.66**	<.001
Academic & Social Struggles	-0.09	.10	0.98	0.91	.322
Financial Problems	-0.12	.05	5.17	0.89*	.023
Cultural Issues	0.13	.07	3.34	1.14	.068
Major Life Events	-0.38	.09	16.95	0.69**	<.001
Constant	1.75	.27	42.56	5.73	<.001

*Note.* Higher odds ratios reflect a greater likelihood of having high academic achievement (GPA  $\geq 3.0$ ), whereas odds ratio values less than one indicate a higher score on the variable is predictive of low academic achievement (GPA  $< 3.0$ ).

\* $p < .05$ , \*\* $p < .01$

The strongest predictor of life satisfaction was stress due to cultural issues, recording an odds ratio of .85. This indicated that students who experienced stress due to cultural issues were .85 times less likely to be satisfied with life than those who did not experience stress within this domain. Similarly, parent-child conflict, academic and social struggles, financial problems, and major life events yielded odds ratios less than 1, indicating students who experienced these stressors were also less likely to be satisfied with life, while controlling for other stressors.

Table 19

*Logistic Regression Predicting Likelihood of High Life Satisfaction from Environmental Stressors (n = 2,379)*

StRESS Factor	<i>B</i>	S.E.	Wald	Odds ratio	<i>p</i>
Academic Requirements	0.05	.08	0.40	1.05	.529
Parent-Child Conflict	-0.53	.06	78.57	0.59**	<.001
Academic & Social Struggles	-0.21	.09	5.02	0.81*	.025
Financial Problems	-0.52	.05	105.51	0.60**	<.001
Cultural Issues	-0.16	.07	6.05	0.85*	.014
Major Life Events	-0.25	.09	7.20	0.78*	.007
Constant	4.27	.30	230.06	87.29	<.001

*Note.* Higher odds ratios reflect a greater likelihood of having high life satisfaction (average SLSS score  $\geq 4.0$ ), whereas odds ratio values less than one indicate a higher score on the variable is predictive of low life satisfaction (average SLSS score  $< 4.0$ ).

\* $p < .05$ , \*\* $p < .01$

**Predicting student success from academic coping strategies.** Logistic regression analyses were used to determine the extent to which strategies to cope with academic demands predict students' success in terms of both academic achievement and life satisfaction (see Tables 20 and 21). The 16 predictors in both analyses are represented by each CADS factor (Time and Task Management, Cognitive Reappraisal, Seek Academic Support, Turn to Family, Talk with Friends and Classmates, Skip School, Social Diversions, Athletic Diversions, Create Diversions, Technology Diversions, Substance Use, Reduce Effort on Schoolwork, Handle Problems Alone, Deterioration, Sleep, and Spirituality). The outcome variables included the dummy-coded variables for GPA and average score on the SLSS, separately.

**GPA.** The full model containing all predictor variables was statistically significant,  $\chi^2(16, N = 2,370) = 333.97, p < .001$ , indicating that the model was able to distinguish between

students who were and were not academically successful. The model as a whole explained between 13.10% (Cox and Snell R Square) and 19.60% (Nagelkerke R squared) of the variance in academic achievement, and correctly classified 77.40% of cases. Ten of the independent variables made a unique statistically significant contribution ( $p < .05$ ) to the model (Time and Task Management, Seek Academic Support, Skip School, Social Diversions, Creative Diversions, Substance Use, Reduce Effort on Schoolwork, Handle Problems Alone, Deterioration, and Sleep). The strongest predictor of academic achievement was coping with academic demands through Time and Task Management, recording an odds ratio of 1.43. This indicated that students who relied on Time and Task Management to cope with academic demands were 1.43 times *more* likely to be academically successful than those who did not rely on this strategy. The odds ratios for Deterioration and Sleep were also above 1, indicating that students who rely on these coping strategies are more likely to experience academic success than those who do not use these strategies. Seeking Academic Support, Skipping School, Social Diversions, Creative Diversions, Substance Use, Reduced Effort on Schoolwork, and Handling Problems Alone, which produced odds ratios *less* than 1, indicate students who relied on these coping strategies were less likely to achieve academic success, while controlling for other coping behaviors.

***Life satisfaction.*** The full model containing all predictors was statistically significant,  $\chi^2(16, N = 2,379) = 624.09, p < .001$ , indicating that the model was able to distinguish between students who were and were not satisfied with life. The model as a whole explained between 23.10% (Cox and Snell R Square) and 32.00% (Nagelkerke R squared) of the variance in life satisfaction, and correctly classified 74.30% of cases. Eight of the independent variables made a unique statistically significant contribution ( $p < .05$ ) to the model (Cognitive Reappraisal, Turn



to Family, Social Diversions, Athletic Diversions, Creative Diversions, Reduced Effort on Schoolwork, Handle Problems Alone, and Deterioration). The strongest predictor of life satisfaction was coping with academic demands by Turning to Family, yielding an odds ratio of 1.90. This indicated that students who relied on Turn to Family when faced with academic stress were 1.90 times *more* likely to be satisfied with life than those who did not rely on this coping strategy. The odds ratios for Cognitive Reappraisal, Social Diversions, and Athletic Diversions were also above 1, indicating that students who relied on these strategies were more likely to be satisfied with life. Creative Diversions, Reduce Effort on Schoolwork, Handling Problems Alone, and Deterioration yielded odds ratios less than 1, indicating students who rely on these strategies to cope with academic demands were less likely to be satisfied with life, when controlling for other coping behaviors.

Table 20

*Logistic Regression Predicting Likelihood of High Academic Achievement from Academic Coping Strategies (n = 2,370)*

CADS Factor	<i>B</i>	S.E.	Wald	Odds ratio	<i>p</i>
Time & Task Management	0.36	.09	16.52	1.43**	<.001
Cognitive Reappraisal	-0.02	.08	0.07	0.98	.797
Seek Academic Support	-0.16	.08	4.00	0.85*	.045
Turn to Family	0.12	.06	3.59	1.13	.058
Talk to Classmate & Friends	0.02	.08	0.08	1.02	.775
Skip School	-0.30	.06	23.11	0.74**	<.001
Social Diversions	-0.22	.07	9.40	0.80**	<.001
Athletic Diversions	0.08	.05	2.67	1.09	<.001
Creative Diversions	-0.17	.06	8.11	0.85**	<.001
Tech. Diversions	-0.02	.07	0.06	0.98	.810
Substance Use	-0.34	.11	8.99	0.71**	<.001
Reduce Effort Schoolwork	-0.74	.08	77.53	0.48**	<.001
Handle Problems Alone	-0.21	.08	6.78	0.81**	.003
Deterioration	0.32	.08	15.32	1.38**	<.001
Sleep	0.16	.06	6.84	1.17**	.009
Spirituality	-0.07	.04	2.72	0.93	.099
Constant	3.18	.51	39.42	23.92	<.001

*Note.* Higher odds ratios reflect a greater likelihood of having high academic achievement (GPA  $\geq 3.0$ ), whereas odds ratio values less than one indicate a higher score on the variable is predictive of low academic achievement (GPA  $< 3.0$ ).

\* $p < .05$ , \*\* $p < .01$

Table 21

*Logistic Regression Predicting Likelihood of High Life Satisfaction from Academic Coping**Strategies (n = 2,379)*

CADS Factor	<i>B</i>	S.E.	Wald	Odds ratio	<i>p</i>
Time & Task Management	0.07	.08	0.66	1.07	.418
Cognitive Reappraisal	0.28	.07	15.08	1.32**	<.001
Seek Academic Support	-0.11	.08	1.87	0.90	.172
Turn to Family	0.64	.06	105.97	1.90**	<.001
Talk to Classmate & Friends	-0.13	.08	2.72	0.88	.099
Skip School	0.01	.06	0.01	1.01	.922
Social Diversions	0.18	.07	7.20	1.20**	.007
Athletic Diversions	0.20	.05	16.65	1.22**	<.001
Creative Diversions	-0.21	.06	13.60	0.81**	<.001
Tech. Diversions	-0.07	.06	1.34	0.93	.247
Substance Use	-0.06	.12	0.29	0.94	.591
Reduce Effort Schoolwork	-0.23	.08	8.09	0.80**	.004
Handle Problems Alone	-0.41	.08	26.80	0.67**	<.001
Deterioration	-0.72	.08	82.82	0.49**	<.001
Sleep	-0.06	.06	1.10	0.94	.293
Spirituality	-0.05	.04	1.24	0.95	.266
Constant	2.28	.49	21.56	9.82	<.001

*Note.* Higher odds ratios reflect a greater likelihood of having high life satisfaction (average SLSS score  $\geq 4.0$ ), whereas odds ratio values less than one indicate a higher score on the variable is predictive of low life satisfaction (average SLSS score  $< 4.0$ ).

\* $p < .05$ , \*\* $p < .01$

## **Chapter V: Discussion**

The purposes of the current study were to examine developmental trends in stressors and coping strategies used by high school students within accelerated academic programs, as well as investigate the extent to which stressors and coping strategies predict students' success. Specifically, longitudinal differences in students' levels of environmental stressors and use of strategies to manage academic demands at Time 1 (while students were in grades 9, 10, or 11) and one year later, at Time 2 (while students were in grades 10, 11, or 12) were explored. Additionally, levels of environmental stressors and academic coping strategies between students enrolled in grades 9, 10, 11, and 12 were compared. Finally, the extent to which environmental stressors and strategies to cope with academic demands predict students' success in terms of academic achievement and life satisfaction were investigated.

This chapter summarizes the results of analyses conducted in the study and discusses key findings within the context of the existing research literature. Then, implications of these results for school psychologists and other key stakeholders involved in the education of students in accelerated academic curriculum are then discussed. This chapter concludes with a review of the study's limitations along with recommendations for future research.

### **Changes in Students' Stressors and Strategies to Manage Academic Demands Over Time**

The purpose of the first two research questions was to investigate mean differences in students' levels of various environmental stressors and use of specific strategies to cope with academic demands at Time 1 (while students were in grades 9, 10, or 11) and one year later, at Time 2 (while students were in grades 10, 11, or 12). A summary of findings that address these

research questions and an integration of findings with the current body of literature follow. Of note, the literature does not currently include studies investigating longitudinal changes in environmental stressors or coping strategies among the specific population of interest—students in accelerated academic curricula.

**Environmental stressors.** In line with previous research findings that younger adolescents experience greater relationship stressors (Laursen, Coy, Collins, 1998; Nieder & Seiffge-Krenke, 2001) and older adolescents experience greater stress related to academic performance (Lee, Puig, Lea, & Lee, 2013), this researcher hypothesized that students would experience higher levels of stressors related to academic requirements and lower levels of stressors related to parent-child conflict and academic and social struggles at Time 2. The finding that high-achieving high school students' environmental stressors differed significantly between Time 1 (grade 9, 10, or 11) and one year later, at Time 2 (grade 10, 11, or 12) was consistent with the hypothesis that students would experience a change in stressors over time, particularly with regard to stressors due to academic requirements. However, when changes within levels of individual stressors including academic requirements, parent-child conflict, academic and social struggles, financial problems, cultural issues, and major life events were explored simultaneously, support for specific hypotheses was mixed. Although a significant increase in stress due to academic requirements was observed, high-achieving students' levels of other stressors, such as parent-child conflict, academic and social struggles, and cultural issues remained relatively stable over time, contrary to the anticipated declines in stress pertinent to parent-child conflict, and academic and social struggles. Of note, there was a trend towards significance for the increase in stress due to financial problems, however the stringent alpha value employed yielded non-significant results.

Although the current study is the first to explore changes in levels of *environmental* stressors among high-achieving youth in accelerated academic curricula, the finding that students experienced a significant increase in stress due to academic requirements is consistent with prior research comparing the changes in *perceived* stress among students entering the IB program or general education curricula in ninth grade (Suldo & Shaunessy-Dedrick, 2013b). While the authors did not directly measure changes using an indicator of academic stressors, they concluded that the increase in students' reported levels of general stress was attributable to their rigorous academic environment. Moreover, the finding that students experience greater stress due to academic requirements over time is consistent with research using samples of youth in general education. Case in point, Lee, Puig, Lea, and Lee (2013) found that academic burnout among 1,530 students in grades 4-12 gradually increased across grade levels, however this was indicated by heightened exhaustion, antipathy, cynicism, and inefficacy likely stemming from stress. Because the number of AP exams participants in the current study completed increased from an average of 1.70 across grade levels (i.e., 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup>) during Time 1 to 2.14 across grade levels (i.e., 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup>) during Time 2, the finding that these students also experienced a corresponding increase in stress associated with academic demands is perhaps unsurprising as the Academic Requirements scale of the StRESS includes items about tests and associated preparations (e.g., studying, homework). Additionally, College Board policy states that AP courses are best positioned as part of high school students' 11<sup>th</sup> and 12<sup>th</sup> grade curriculum (College Board, 2010), suggesting that as high-achieving students progress through high school, they are likely to enroll in a greater number of accelerated courses and thus are likely to experience high stress associated with rigorous academic demands.

The finding that students' levels of stress related to parent-child conflict and academic and social struggles remained relatively stable over time is inconsistent with prior research demonstrating that younger adolescents experience greater relationship stress than do older adolescents (Laursen, Coy, & Collins, 1998; Nieder & Seiffge-Krenke, 2001). This discrepancy may be attributable to the fact that previous studies compared youths' changes in levels of relationship stress over the course of multiple years. Because the current study investigated changes in stress due to parent-child conflict, and academic and social struggles after collapsing participants across grade levels into a single sample, this study may not be as sensitive to changes in stress as investigations yielding significant decreases in relationship stressors over time using distinct age or grade-level cohorts. However, the non-significant 3-way interactions suggested that the differences in stressors across time were quite similar in magnitude and direction between students in different grade levels). Notably, results from the current study are consistent with findings from Groër, Thomas, and Shoffner's (1992) longitudinal investigation of students' stressors in 9<sup>th</sup> grade, and three years later during 12<sup>th</sup> grade, which indicated that students' most frequent sources of stress at both time points included hassling with parents.

**Coping strategies to manage academic demands.** It was hypothesized that the coping strategies AP-IB students used to manage academic demands would differ significantly between Time 1 and one year later, at Time 2, such that students would rely more frequently on strategies often conceptualized as productive (e.g., cognitive reappraisal, seek academic support, turn to family) or independent (i.e., handle problems alone), or talk to friends and classmates (Amirkhan & Auyeung, 2007; Frydenberg & Lewis, 2000), and reduce use of strategies conceptualized as avoidant including skipping school and reducing effort on schoolwork (Amirkhan & Auyeung, 2007; Zimmer-Gembeck & Skinner, 2011). As hypothesized, the coping strategies this sample of

high-achieving high school students used to manage academic demands differed at Time 1 (grade 9, 10, or 11) and Time 2 (grade 10, 11, or 12). However, when changes in mean levels of individual coping strategies were explored, hypotheses were not supported. Students experienced a significant *increase* in coping strategies typically considered maladaptive or unproductive, including substance use, reduce effort on schoolwork, and deterioration. This was inconsistent with the hypothesis that students would increase their use of productive (i.e., cognitive reappraisal) or individual (i.e., handle problems alone) coping strategies, and decrease their use of avoidant or coping strategies (i.e., skipping school). Of note, findings in the current study indicated a trend towards significant increases in frequency of coping with academic demands by turning to family, skipping school, and engaging in athletic diversions; these changes were not significant when the stringent alpha value was adopted.

Although there have been no other published studies investigating changes in high-achieving students' strategies to manage academic demands over time, the findings of the current study may be explored through the broader context of changes in coping styles across adolescence. The finding that high-achieving students increased their use of three coping strategies, while maintain levels of all others, is consistent with Frydenberg and Lewis' (2000) conclusion that adolescent youth increased their repertoire of coping strategies (both productive and non-productive) between grades 9 and 11, without terminating use of coping strategies that may have been unsuccessful in reducing stress. Of interest, however, is that students within the current study only increased their use of coping strategies typically considered maladaptive, rather than also increasing those expected to result in a reduction in students' levels of academic stress (i.e., time and task management, cognitive reappraisal). The finding that high-achieving students coped more often through substance use over time is consistent with national trends in



youth substance usage, as 22.1% of 8<sup>th</sup> graders, 47.1% of 10<sup>th</sup> graders, and 62.0% of 12<sup>th</sup> graders report drinking alcohol within the past year (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2015). Moreover, 14.8% of 8<sup>th</sup> graders, 25.7% of 10<sup>th</sup> graders, and 38.1% of 12<sup>th</sup> graders report having ever smoked cigarettes in their lifetime (Johnston et al., 2015). The increase in substance use to cope with academic demands over time within the current sample may thus reflect the tendency for older adolescents to use substances (for any reason), rather than reflect a coping strategy specific to high-achieving youth. The finding that high-achieving students increased their use of avoidant strategies including reducing effort on schoolwork is discrepant from findings supported by studies of general youth in which younger adolescents (ages 13-15) decreased use of non-productive coping strategies over time (through age 16-18) (Amirkhan & Auyeung, 2007; Zimmer-Gembeck & Skinner, 2011). Of note, this particular strategy may be reflective of high-achieving youths' academic burnout (i.e., exhaustion, antipathy, cynicism, and inefficacy), which tends to increase with age (Lee, Puig, Lea, & Lee, 2013). Similarly, the increased frequency in coping through behaviors described as deterioration (e.g., get mad, annoyed, or irritated) may reflect an increase in negative emotions generated by exhaustion, cynicism, or inadequacy associated with academic burnout among older students (Tuominen-Soini & Salmela-Aro, 2014).

### **Grade Level Differences in Stressors and Coping Strategies to Manage Academic Demands**

The purpose of the research questions three and four was to investigate differences in mean levels of students' environmental stressors and strategies to cope with academic demands between grades 9, 10, 11, and 12. A summary of findings that address these research questions and an incorporation of findings with the current body of literature follow. Of note, no studies

investigating grade level differences in stressors or coping strategies among students in accelerated academic curricula have been published.

**Environmental stressors.** Akin to the anticipated findings in the across-time changes in stress, it was hypothesized that older students would report higher frequency of stressors related to academic requirements and lower levels of stressors related to parent-child conflict and academic and social struggles. The finding that high-achieving high school students' levels of categories of environmental stressors differed significantly between 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade was consistent with the hypothesis that students would experience unique stressors at each grade level. The hypothesis that students would experience an increasing trend in environmental stress due to academic requirements was supported, as students in 9<sup>th</sup> grade experienced significantly less stress due to academic requirements than students in 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade. The hypothesis that students would experience a decreasing trend in stress associated with parent-child conflict was also supported, as 12<sup>th</sup> grade students experienced significantly less stress due to conflict of this nature than students in 10<sup>th</sup> and 11<sup>th</sup> grade. In contrast, the hypothesis that students would report a decreasing trend in stress due to academic and social struggles was not supported, as students in 9<sup>th</sup> grade experienced significantly *less* stress in this domain than those in 11<sup>th</sup> and 12<sup>th</sup> grade. Interestingly, analyses also revealed a significant difference in stress due to financial problems between grade levels, with 9<sup>th</sup> and 10<sup>th</sup> grade students reporting significantly less stress due to financial issues than students in 11<sup>th</sup> and 12<sup>th</sup> grade.

While the literature does not currently include other research studies investigating differences in high-achieving students' environmental stressors across grade levels, the findings of the current study may be explored through the broader context of differential levels of stressors experiences across adolescence. Consistent with previous research investigating

samples of general youth, high-achieving students in 9<sup>th</sup> grade reported significantly less stress due to academic requirements than those in 10<sup>th</sup> through 12<sup>th</sup> grade, indicating that older adolescents experience heightened stress related to their academic performance (Lee et al., 2013). This is likely influenced by older students' impending graduation and recognition that academic performance plays an important role in college and career trajectories. Moreover, older adolescents within this sample enrolled in a greater number of AP courses; 9<sup>th</sup> grade students took less than one AP course on average, while 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> graders took an average of 1.53, 2.53, and 2.34 AP courses, respectively. A greater number of college-level courses may thus contribute to higher levels of stress due to requirements associated with enrollment.

The finding that students in 12<sup>th</sup> grade experienced less stress than those in 10<sup>th</sup> and 11<sup>th</sup> grade due to parent-child conflict is also supported by the research literature using samples of general youth in which younger adolescents reported greater stress due to relationships than older adolescents (Laursen, Coy, & Collins, 1998; Nieder & Seiffge-Krenke, 2001). Of note, 11<sup>th</sup> and 12<sup>th</sup> graders within the current study reported greater stress due to academic and social struggles than those in 9<sup>th</sup> grade. This may reflect greater challenges among older students within college-level curricula to navigate academic, rather than exclusively social, demands.

In the current study, 11<sup>th</sup> and 12<sup>th</sup> grade students reported greater stress due financial problems than their peers in 9<sup>th</sup> and 10<sup>th</sup> grade, which likely reflects older adolescents' employment status and/or dissatisfaction with their wage. For example, older students may be unable to work despite being of age due to academic demands, or have minimal income due to the nature of the jobs they are qualified for. Of note, national trends in employment indicate that only 16.6% of 16-17 year olds are employed, while 37.9% of 18-19 year olds are employed (U.S.

Department of Labor, 2013), which may correspond to an increase in stress due to financial problems associated with personal employment among high-achieving youth.

Taken together, both the longitudinal and cross-sectional components of the current study indicate that older AP-IB students are likely to report more frequent stressors specific to academic requirements in comparison to their younger AP-IB peers, particularly freshmen. Changes in stressors in other domains are not as robust within students across grade levels, and may be unique to differences between grade level cohorts. Specifically, cross-sectional comparisons revealed that 11<sup>th</sup> and 12<sup>th</sup> grade students reported more frequent stress due to academic and social struggles and financial problems compared to underclassmen, while longitudinal analyses indicate students did not have significantly higher stress in these domains over time. Of note, there was a trend towards significant increases in stress pertinent to financial problems within students, supportive of the finding that upperclassmen experience greater stress within this domain.

**Coping strategies to manage academic demands.** Akin to the anticipated findings in the across-time changes in coping, it was hypothesized that coping strategies used to manage academic demands will differ significantly across high achieving students from different grade levels, with older students reporting greater use of problem-oriented strategies (cognitive reappraisal, academic support seeking, turning to family, and talking to friends and classmates), and less use of avoidant strategies (handling problems alone, skipping school, and reducing effort on schoolwork). As hypothesized, this sample of high-achieving high school students' use of strategies to cope with academic demands differed significantly between 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade. However, hypotheses specific to the direction in which specific coping strategies would differ were not supported. Interestingly, older students (11<sup>th</sup> and 12<sup>th</sup> graders) reported

greater use of strategies typically considered non-productive or maladaptive, including skip school, substance use, sleep, and reduce effort on schoolwork, as compared to students in 9<sup>th</sup> and 10<sup>th</sup> grade. Of note, 9<sup>th</sup> and 10<sup>th</sup> grade students more frequently relied on strategies typically considered productive, such as seeking academic support, creative diversions, and spirituality.

There have been no other published research studies investigating differences in high-achieving students' strategies to manage academic demands across grade levels, however the findings of the current study may be explored through the broader context of coping styles employed across adolescence. The finding that older high-achieving students in grades 11 and 12 more frequently relied on maladaptive strategies including skip school, reduce effort on schoolwork, and sleep remain unsupported by the literature on samples of general youth, which suggest that students experience a decrease in coping strategies considered unproductive (Amirkhan & Auyeung, 2007; Zimmer-Gembeck & Skinner, 2011). As with the longitudinal findings, the conclusion that older adolescents skip school and reduce effort on schoolwork may be reflective of their academic burnout, which tends to increase with age (Lee et al., 2013). Another potential explanation for 12<sup>th</sup> grade students' reliance on these maladaptive coping strategies includes their knowledge of acceptance to college, as most students learn of their college acceptances by the spring of their senior year, around the time data was collected. The increase in these non-productive strategies by 11<sup>th</sup> and 12<sup>th</sup> grade students is also consistent with Frydenberg and Lewis's (2000) finding that 11<sup>th</sup> grade students were significantly higher on the scale measuring students' inability to cope or "not cope" than 9<sup>th</sup> grade students. Additionally, the finding that students in 11<sup>th</sup> and 12<sup>th</sup> grade more frequently relied on substance use to cope with academic demands may reflect the increasing trend in substance abuse among the general

adolescent population (Johnston et al., 2015), consistent with findings from longitudinal analyses.

The conclusion that 9<sup>th</sup> and 10<sup>th</sup> grade students more frequently rely on adaptive coping strategies including seek academic support, creative diversions, and spirituality is also inconsistent with findings using general samples of youth. Frydenberg and Lewis (2000) found that students increased coping through support seeking between 9<sup>th</sup> and 11<sup>th</sup> grade, while coping through engaging in diversions and seeking spiritual support remained stable during this transition. One explanation for 9<sup>th</sup> and 10<sup>th</sup> graders' reliance on seeking academic support could be that they have not yet learned how to master their rigorous curriculum independently and thus more frequently turn to teachers for assistance. Additionally, longitudinal research investigating students' perceptions of teacher academic support has found a linear downward trend from primary through secondary school, indicating perceptions of support may inhibit 11<sup>th</sup> and 12<sup>th</sup> grade students from seeking academic assistance (Bru, Stormes, Munthe, & Thuen, 2010). The finding that 9<sup>th</sup> and 10<sup>th</sup> grade students more frequently engaged in coping through creative diversions may be due to their greater access to diversions of this nature, as many creative diversions, including writing, drawing, cooking, and playing an instrument, may be done within the home and independently. Older adolescents who drive may be able to engage in athletic and social diversions more readily than younger adolescents without such ease of mobility. Finally, the finding that 10<sup>th</sup> grade students turned to spirituality to cope with academic demands more frequently than 11<sup>th</sup> and 12<sup>th</sup> grade students may be a reflection of younger adolescents' tendency to preserve their "well-adjusted" identities. A study of high school students' religiosity and psychosocial adjustment found that spirituality was a significant predictor of substance abuse, whereby those with high personal spirituality were less likely to engage in substance use, both

concurrently and in the future (Good & Willoughby, 2013). Because, as a whole, 11<sup>th</sup> and 12<sup>th</sup> graders rely on substances more often than 10<sup>th</sup> graders to cope, this may also correspond with their less frequent reliance on spirituality.

Taken together, both the longitudinal and cross-sectional components of the current study indicate that older AP-IB students are likely to report greater use of potentially problematic coping strategies in comparison to underclassmen. Such strategies often deemed non-productive employed by older students include substance use, reduce effort on schoolwork, and deterioration. As with stressors, there were some inconsistent findings between comparisons of academic coping strategies within students over time and between grade level cohorts. Specifically, cross-sectional analyses detected a trend for older students to seek academic support, turn to spirituality, and engage in creative diversions less often than their younger AP-IB counterparts, while longitudinal comparisons did not reveal significant declines in the use of these more productive strategies within students over time.

### **Stress and Coping as Predictors of Student Success**

The purpose of the final research questions was to understand the extent to which students' success, in terms of both academic achievement and life satisfaction, could be predicted from their environmental stressors and strategies used to cope with academic demands. A summary of findings that address these research questions and an incorporation of findings with the current body of literature follow.

**Predicting academic achievement from environmental stressors.** It was hypothesized that environmental stressors would explain a large, statistically significant amount of variance in most indicators of student success, with higher levels of stressors across domains investigated (e.g., academic requirements, parent-child conflict) predictive of lower academic achievement

(Cunningham et al., 2002; Schraml et al., 2012) and lower life satisfaction (Ash & Huebner, 2001; Chappel, Suldo, & Ogg, 2014; Suldo & Huebner, 2004). In the current sample, environmental stressors explained about 4 to 7% of the variance in students' GPA, which was a smaller size effect than anticipated. Regardless of the relatively small magnitude of the effect, the model of stressors significantly distinguished between the students who were and were not considered academically successful (GPA > 3.0). Environmental stressors including academic requirements, parent-child conflict, financial problems, and major life events demonstrated unique contributions to students' achievement. In line with expectations, students who experienced more stress due to parent-child conflict, financial problems, and major life events were less likely to be academically successful, whereas students with more stress due to academic requirements had *higher* GPAs.

The finding that students who experienced higher stress due to academic requirements were more likely to be academically successful contrasts with previous findings using samples of general youth, which linked heightened stress to lower academic performance (Cunningham, Hurley, Foney, & Hayes, 2002; Schraml, Perski, Grossi, & Makower, 2012). Notably, Suldo and colleagues' previous investigations of the impact of perceived stress on high-achieving students vs. peers in general education found that high-achieving students had better performance, in spite of reporting greater levels of stress (Suldo, Shaunessy, & Hardesty, 2008; Suldo & Shaunessy-Dedrick, 2013a). Thus, taken together, findings indicate that high-achieving youth are able to excel academically, particularly when experiencing greater stress due to rigorous academic coursework. However, high-achieving youth who experience greater stress due to parent-child conflict, financial problems, and major life events are likely to experience lower academic



performance, similar to their general education peers (Cunningham, Hurley, Foney, & Hayes, 2002; Schraml, Perski, Grossi, & Makower, 2012).

**Predicting life satisfaction from environmental stressors.** Environmental stressors explained about 17 to 23% of the variance in students' life satisfaction, indicating a stronger relationship between stressors and psychological versus academic indicators of student success. The model of stressors distinguished between students who were and were not satisfied with life (SLSS average  $\geq 4.0$ ). Environmental stressors including parent-child conflict, academic and social struggles, financial problems, cultural issues, and major life events made unique, negative contributions to students' life satisfaction. Students who experienced higher levels of stress due to each of these stressors were more likely to experience lower satisfaction with life. Whereas academic stress was associated with better student success in terms of GPA, level of stress in the domain of academic requirements was unrelated to students' life satisfaction, suggesting academic stress may be neither facilitative nor harmful with regard to the life satisfaction appraisals of high-achieving students.

The finding that students who experienced greater stress due to parent-child conflict, academic and social struggles, financial problems, cultural issues, and major life events were less likely to experience satisfaction with life is consistent with previous research investigating stress and satisfaction among samples of general youth (Abolghasemi & Varaniyab, 2010; McKnight, Huebner, & Suldo, 2012). In contrast, prior research with general samples of youth has identified inverse relationships between school-related stress and life satisfaction (Natvig, Albrektsen, & Qvarnstrom, 2003; Suldo, Riley, & Shaffer, 2006). As academic requirements did not uniquely predict diminished life satisfaction within the current sample, it is possible that high-achieving youth may be able to maintain a positive appraisal of their life, despite

experiencing heightened stress due to rigorous academic requirements associated with their program enrollment. This is consistent with Suldo and colleagues' previous findings that high-achieving youth had comparable life satisfaction to their general education peers, despite experiencing greater perceived stress due to academic demands (Suldo, Shaunessy, & Hardesty, 2008; Suldo & Shaunessy-Dedrick, 2013a).

**Predicting academic achievement from coping strategies to manage academic demands.** It was hypothesized that academic coping strategies would explain a large amount of variance in students' academic achievement (i.e., GPA) as well as life satisfaction, with higher achievement predicted by more frequent use of strategies that are adaptive in nature (e.g., cognitive reappraisal, time and task management, seek academic support; Reis, Colbert, & Hebert, 2005) and lower life satisfaction predicted by more frequent use of strategies maladaptive in nature, such as substance use and anger/obsessive thoughts (Suldo, Shaunessy, & Hardesty, 2008). Coping strategies accounted for roughly 13 to 20% of the variance in students' GPA, which was somewhat less than hypothesized but more than the effect of stressors that was identified in this study. The model including all coping strategies distinguished between the students who were and were not considered academically successful (GPA > 3.0). Time and task management, seek academic support, skip school, social diversions, creative diversions, substance use, reduce effort on schoolwork, handle problems alone, deterioration, and sleep each made statistically significant unique contributions to students' academic achievement. Students who employed time and task management, deterioration, and sleep to cope with academic demands were more likely to achieve academic success, while those who relied on seeking academic support, skipping school, social diversions, creative diversions, substance use, reduced effort on schoolwork, and handling problems alone were less likely to achieve academic success.

The finding that students who employed time and task management, a strategy considered adaptive in nature, to cope with academic demands were more likely to experience academic success is consistent with previous investigations of academically talented youth (Reis, Colbert, & Hebert, 2005) as well as general samples of students (Frydenberg & Lewis, 1999). Discrepant from previous findings, this sample of high-achieving youth was also more likely to be academically successful when responding to academic stress through deterioration (e.g., ruminating; getting mad, annoyed, or irritated) and sleeping. No previous studies supporting the finding that deterioration is linked to academic success could be located within the current body of research literature. One possible explanation for this phenomenon is that rumination over academic work may reflect academically successful AP-IB students' concern with their academic performance; they do not easily "let go" of performing poorly on academic work and become frustrated with themselves when they do not meet their high expectations for achievement. Qualitative research on high-achieving high school students demonstrates that this population of youth maintains the belief they should experience academic success and thriving social lives, which comes at the expense of their sleep (Foust, Hertberg-Davis, & Callahan, 2008). Poor sleeping patterns may thus reflect AP and IB students' dedication to their academic pursuits, allowing them to spend more time studying for exams, writing papers, and completing projects to earn higher grades.

Consistent with previous research on how high school youth coped with academic stress, high-achieving students using avoidant coping (e.g., skip school, substance use, reduce effort on schoolwork) were less likely to experience academic success (Arsenio & Loria, 2014). Additionally, students who elected to cope with academic demands by handling problems alone were less likely to achieve academic success, consistent with the finding that students who cope

through disengagement (e.g., denial, avoidance) experience lower GPAs (Arsenio & Loria, 2014). Discrepant from previous research with elementary and middle school youth that found students who rely on help-seeking in the classroom have better academic outcomes (Skinner, Pitzer, & Steele, 2013), high-achieving high school students who coped by seeking academic support were less likely to experience academic success. This finding may be in part due to the fact students who are in the greatest need of academic assistance are those who are not already academically successful. Thus, reliance on seeking academic support from educators may only pertain to students who did not meet the threshold for academic success used in the current study (i.e., GPA > 3.0).

#### **Predicting life satisfaction from coping strategies to manage academic demands.**

Coping strategies accounted for roughly 23 to 32% of the variance in students' life satisfaction, in accordance with the hypothesis. The model including all coping strategies reliably distinguished between the students who were and were not satisfied with life (SLSS score  $\geq 4.0$ ). Cognitive reappraisal, turn to family, social diversions, athletic diversions, creative diversions, reduced effort on schoolwork, handle problems alone, and deterioration each made significant unique contributions to students' life satisfaction. Specifically, students who in times of academic stress relied more frequently on turning to family, cognitive reappraisal, social diversions, and athletic diversions were more likely to report high life satisfaction, while students who coped with academic demands through more frequent use of creative diversions, reduce effort on schoolwork, handling problems alone, and deterioration were less likely to report high life satisfaction.

The finding that coping strategies accounted for nearly one-third of the variance in global life satisfaction among high-achieving youth is consistent with the findings reported by Suldo,

Shaunnessy, and Hardesty (2008). Moreover, the positive relationship between coping strategies typically considered adaptive (e.g., cognitive reappraisal, turning to family, and social and athletic diversions), and positive emotions and higher life satisfaction has been identified among samples of students in general education (Arsenio & Loria, 2014; Lews & Frydenberg, 2004; Saha, Huebner, Hills, Malone, & Valois, 2014) and high-achieving students (Suldo, Shaunnessy, & Hardesty, 2008). The negative associations between strategies categorized in the literature as maladaptive (e.g., reduce effort on schoolwork, handle problems alone, deterioration) and life satisfaction is also consistent with research using general samples (Lewis & Frydenberg, 2004) as well as among high-achieving youth (Suldo, Shaunnessy, & Hardesty, 2008). Of note, creative diversions, which has previously been categorized as a productive coping strategy among other relaxing diversions (Frydenberg & Lewis, 1999), was inversely related to students' appraisal of their global life satisfaction. One potential explanation for this finding is that students who rely on creative diversions (e.g., write about problems or feelings) use written expression as a form of rumination that does not actively reduce stress, thus producing detrimental effects on students' life satisfaction.

### **Implications for School Psychologists**

Advanced Placement courses and the International Baccalaureate programs are among the most prevalent curricular options offered to high-achieving and gifted high school youth. During the 2010-2011 school year, approximately 3.5 million U.S. students enrolled in AP and IB courses (Thomas, Marken, Gray, & Lewis, 2013), a considerable increase since 2002-2003, when only 1.5 million and 165,000 students enrolled in AP and IB, respectively (Waits, Setzer, & Lewis, 2005). AP and IB enrollment continues to increase, in part due to federal policy initiatives to offer access to accelerated curriculum to all students (Spalding, Eden, & Heppner,

2012). Such an expansion affords more students who successfully complete accelerated high school coursework with benefits including greater satisfaction with the caliber of their high school education (Bleske-Rechek, Lubinski, & Benbow, 2004), feeling better prepared for college (Taylor & Porath, 2006), higher SAT scores (McKillip & Rawls, 2013), higher college GPAs (Murphy & Dodd, 2009), and higher college graduation rates (Shah, Dean, & Chen, 2010). Additionally, most American colleges offer course credit for passing scores obtained on AP and IB exams, thus lowering students' total college tuition cost and time to degree completion (Dougherty, Mellor, & Jian, 2006).

Despite the many benefits realized by high-achieving youth completing accelerated high school curricula, previous research has demonstrated that there are a number of challenges uniquely associated with enrollment in AP courses and IB programs. Specifically, comparisons of stress levels of students in different curricula indicate that AP and IB students have significantly higher perceived stress (i.e., overall or general stress levels) compared to students in general education, even after accounting for between-group differences in personality and family SES (Suldo & Shaunessy-Dedrick, 2013a; Suldo, Shaunessy, & Hardesty, 2008). Because the accumulation of stressful life occurrences serves as a pervasive risk factor for the development of psychopathology (Grant et al., 2003), AP and IB students may be particularly vulnerable to mental health concerns. Furthermore, the extent to which students are negatively impacted by stress is partly influenced by their use of productive coping strategies (Frydenberg, 2008; Nicolai, Laney, & Mezulis, 2013).

By identifying the environmental stressors students in accelerated high school curricula experience within a given grade level, this study provides school psychologists with information pertinent to targeted prevention and intervention efforts. Longitudinal analyses revealed that,

across all grade levels, students experienced an increase in stress due to academic requirements. Findings from cross-sectional analyses suggested that 9<sup>th</sup> grade students in particular may have the lowest levels of stress due to academic requirements, whereas upticks in levels of stress in this domain may appear in the sophomore year and persist through 11<sup>th</sup> and 12<sup>th</sup> grades. Ninth graders also experienced less stress than upperclassmen in the domain of academic and social struggles, while 9<sup>th</sup> and 10<sup>th</sup> grade students reported less stress with financial issues than 11<sup>th</sup> and 12<sup>th</sup> grade students. Unfortunately, findings from this study indicate that the increase in stressors over the course of high school co-occurs with an increase in frequency of use of maladaptive coping strategies. Longitudinal analyses revealed that in a similar manner across all grade levels, students increased their reliance on substance use, reducing effort on schoolwork, and deterioration in response to academic stressors. Cross-sectional comparisons further supported that 11<sup>th</sup> and 12<sup>th</sup> grade students relied more heavily on some maladaptive coping strategies, namely, skipping school, substance use, and disrupted sleep patterns. Taken together, these results indicate that 9<sup>th</sup> grade may be an optimal time for universal prevention efforts aimed at maintaining and improving high-achieving students' use of adaptive coping strategies for use in managing current and future academic demands. Moreover, findings suggest that 11<sup>th</sup> and 12<sup>th</sup> grade students may benefit from information on productive methods of coping given their heavy reliance on strategies considered maladaptive. The importance of helping students cultivate adaptive coping strategies is underscored by this study's findings pertinent to the increased likelihood of student success, in terms of a desirable GPA and high life satisfaction, among students who rely on specific coping strategies while limiting use of others, as described next.

Results from the current study shed light on which specific coping strategies are associated with academic success and optimal life satisfaction among high-achieving high school

students. The findings suggest that school psychologists would be wise to encourage students to cope through time and task management, cognitive reappraisal, turning to family, and athletic diversions, as each of these strategies was linked to student success. Concurrently, school psychologists may wish to discourage students from avoidance strategies (skipping school, using substance, reducing effort on schoolwork), handling problems alone, relying too frequently on diversion of a creative or social nature, and responding emotionally or obsessively, as these strategies were predictive of lower achievement and/or life satisfaction.

To equip high-achieving 9<sup>th</sup> grade students with the aforementioned coping strategies suggested as adaptive in the current study, school psychologists could facilitate a universal prevention effort aimed (a) educating students on productive and non-productive coping responses to academic stress, and (b) building their adaptive coping skills. Prior investigations suggest that school-based primary prevention programs targeting stress management have positive effects on reductions in indicators of stress and improvements in coping skills (Kraag, Zeegers, Kok, Hosman, & Abu-Saad, 2006), as well as positive academic outcomes such as performance on high-stakes tests (Keogh, Bond, & Flaxman, 2006) and GPA (Chinaveh, Ishak, & Salleh, 2010). Because most high schools offer an orientation for incoming 9<sup>th</sup> grade students during the summer prior to entry, this would be an optimal time to offer instruction to high-achieving students who are embarking on accelerated coursework. In addition to offering direct support to students, school psychologists can consult with other key stakeholders, including parents and teachers, who are in a more proximal position to monitor and reinforce appropriate coping behaviors more consistently within the home and school environments.

After providing initial content related to adaptive coping to students in 9<sup>th</sup> grade, school psychologists could provide supplemental information regarding the relationship between



various coping strategies and academic and mental health indicators during 11<sup>th</sup> and 12<sup>th</sup> grade. This would be an optimal time to provide refresher information, perhaps through a series of in-school assemblies, as this study revealed 11<sup>th</sup> and 12<sup>th</sup> grade students rely on maladaptive strategies more frequently than those in 9<sup>th</sup> and 10<sup>th</sup> grade. Moreover, if maladaptive coping is detected as indicated by academic burnout and/or symptoms of mental health problems, school psychologists could direct more targeted intervention efforts towards small groups of students. The small group intervention could provide more detailed coaching regarding coping strategies, for instance through direct instruction in productive methods of coping, providing students with the opportunity to observe a model then actively role play adaptive coping strategies, and monitoring students' progress related to increased use of adaptive (and decreased use of maladaptive) coping strategies.

### **Contributions to the Literature**

The current study contributes to the limited body of research literature on the social-emotional functioning of high-achieving students enrolled in accelerated academic curricula including AP courses and IB programs. To date, there are no published longitudinal investigations of the changes in stressors and supplemental coping strategies in a sample of high-achieving students enrolled in rigorous high school curricula. Additionally, cross-sectional studies of the differences in the environmental stressors experienced by, and coping strategies used by, high-achieving high school students remain absent from the literature. This study thus provides a unique contribution by delineating changes in students' stressors and academic coping strategies over time, as well as identifying the differences in stressors and coping strategies of students across grade levels. Regarding stress, findings indicate that, across all grade levels, students experience a significant increase in stress related to academic requirements over time.

Between grade level comparisons further reveal that 9<sup>th</sup> graders experience less due to academic requirements, academic and social struggles, and financial issues than their older peers more advanced in their accelerated curricula (i.e., grades 11-12). Findings related to coping indicate that, across all grade levels, students increase their use of coping strategies considered maladaptive, including substance use, reduce effort on schoolwork, and deterioration, over time. Between grade level comparisons further demonstrate that 11<sup>th</sup> and 12<sup>th</sup> grade students more frequently rely on skipping school, substance use, and sleep than 9<sup>th</sup> and 10<sup>th</sup> grade students, while 9<sup>th</sup> and 10<sup>th</sup> grade students more often use creative diversions, seek academic support, and spirituality to cope with academic demands. Taken together, these findings shed light on the fact that early school-based prevention/intervention efforts should target 9<sup>th</sup> grade students to equip them with skills before they (a) encounter an increase in stress related to academic demands, coupled with (b) develop a tendency to respond to such stressors through maladaptive coping strategies, upon entering higher grade levels.

While previous investigations have examined the relationship between high-achieving students' stress and coping, and their academic and mental health outcomes, no former studies have explored this relationship using measures developed specifically for use with this population of students. The current study contributes to the literature by delineating the relationship between high-achieving high school students' stressors and coping strategies to manage academic demands using the StRESS (Suldo, Dedrick, Shaunessy-Dedrick, Roth, & Ferron, in press) and CADS (Suldo, Dedrick, Shaunessy-Dedrick, Fefer, & Ferron, in press), both of which were developed to measure stressors and coping particular to high-achieving youth in accelerated curricula. Findings from the study indicate that these students are *more* likely to experience academic success (i.e., GPA > 3.0) when they experience stress due to academic

requirements, however students experiencing stress due to parent-child conflict, financial problems, and major life events were *less* likely to be academically successful. Similarly, stress due to academic requirements was not related to suboptimal life satisfaction (i.e., SLSS average < 4.0), however stress in the domains of cultural issues, parent-child conflict, academic and social struggles, financial problems, and major life events was related to low life satisfaction. Regarding the relationship of coping to indicators of student success, findings indicate that students who relied on time and task management, emotional deterioration, and sleep were *more* likely to achieve academic success, while those relying on seeking academic support, skipping school, social diversions, creative diversions, substance use, reduce effort on schoolwork, and handle problems alone were *less* likely to achieve academic success. Findings related to life satisfaction suggest that students who use turn to family, cognitive reappraisal, and social and athletic diversions were *more* likely to be satisfied with life, while those using creative diversions, reduce effort on schoolwork, handle problems alone, and deterioration are *less* likely to have high life satisfaction. These findings contribute to the literature as they indicate that the heightened stress related to academic demands experienced by students enrolling in accelerated academic curricula does not necessarily co-occur with diminished academic or mental health outcomes. Furthermore, findings suggest coping strategies often categorized as “maladaptive” (i.e., sleep, deterioration) in samples of general youth, may actually be adaptive for high-achieving students’ academic success, while coping strategies frequently labeled “adaptive” (i.e., seeking academic support, social and creative diversions) may be problematic with regard to academic outcomes.

## **Limitations**

The first potential limitation of this study is the heavy reliance on data collected via students' self-report. Self-report data may be biased due to inaccuracy given the retrospective nature of the data collection (e.g., recalling experience "within the current school year") and socially desirable responding; this may be particularly true for a sample of high-achieving youth regarding their beliefs, attitudes, and behaviors related to their academic environment

Another potential limitation of the current study is that high-achieving students' changes in stressors and coping strategies were measured at only two time points separated by one year. Multiple waves of data collection (e.g., 9<sup>th</sup> grade through 12<sup>th</sup> grade) could provide information to further disentangle the degree to which stressors are experienced and academic coping strategies are employed by high-achieving students throughout high school, and to detect trends throughout a given school year (e.g., fall to spring). Additionally, nonlinear trends cannot be examined with the data collected from these two time points. More frequent data collection throughout the year (e.g., weekly, monthly) could thus provide for a better understanding of stress and coping throughout a given grade level over time. However, high correlations between stressors at both time points, and between strategies used to cope with academic demands at both time points, are indicative of the rather high stability of these variables.

A third limitation of this study is the questionable generalizability, given the restrictions of the current sample (i.e., high school students residing in a single southeastern state in the U.S.). The use of convenience sampling from 19 high schools offering accelerated academic curricula may have resulted in a sample that is not representative of the larger population of American high school youth enrolled in AP courses and IB programs. The lack of a comparison sample of high school students in general education precludes a full understanding of the extent

to which findings obtained in the current study are unique to high-achieving students in AP-IB, versus teenagers in general. Moreover, it is important to note that there can be as many within-group as between-group differences among samples. The current study created subsamples of students grouped according to grade level, without detecting nuances within a given grade level. By using a statistical procedure such as cluster sampling, levels of stress, coping, and student success (e.g., life satisfaction, GPA) within grade levels could have also been explored. Another limitation of this study is that the author did not examine nor statistically account for school-level differences in students' mean levels of stressors or strategies to manage academic demands.

A final limitation of this study is that it is non-experimental and thus recommendations for key stakeholders working with AP-IB youth are based on correlational findings rather than findings that can establish causal relations. The use of an experimental design that randomly assigned AP-IB students across different grade levels to an intervention designed to improve their use of productive coping strategies and decrease their use of non-productive strategies to manage their stress would further delineate the appropriate timing and methods of increasing AP-IB student success.

### **Summary and Future Directions**

In conclusion, the current study augments the existing literature on the social-emotional functioning of high-achieving high school students enrolled in accelerated curricula by revealing developmental trends in environmental stressors and academic coping strategies through longitudinal and cross-sectional comparisons. Results from the current study indicate that high-achieving students experience an increase in stress due to academic requirements over time, with students in 10<sup>th</sup>-12<sup>th</sup> grade reporting higher levels of academic stress than students in 9<sup>th</sup> grade. Students in 11<sup>th</sup> and 12<sup>th</sup> grade also report experiencing significantly more stress than 9<sup>th</sup> graders

in the domains of academic and social struggles and financial issues. Unfortunately, this increase in stress is not supplemented by increased use of productive coping strategies. This study revealed that, overall, students respond to the increased stress through increasing their use of maladaptive strategies including substance use, reduce effort on schoolwork, and deterioration. This is also evidenced by 11<sup>th</sup> and 12<sup>th</sup> grade students' more frequent reliance on strategies including skipping school, substance use, and reduce effort on schoolwork to manage their academic demands.

This study also delineates high-achieving students' academic and mental health trajectories by examining the likelihood of success based on stressors experienced and coping strategies used to manage academic demands. Environmental stressors explained three to four times as much of the variance in students' life satisfaction as explained in academic achievement. Fortunately given the primary type of stressor this population incurs, findings indicate that high-achieving students' stress due to academic requirements is related to greater academic success and may not compromise life satisfaction. Moreover, while stress due to academic and social struggles is predictive of suboptimal life satisfaction, stress within this domain was not predictive of poorer academic outcomes. These findings indicate that high-achieving students may be uniquely capable of managing stress related to their academic requirements, or possess internal assets and/or environmental resources that facilitate health and offset potential negative effects of stress, as they do not experience deleterious academic outcomes similar to effects observed among general samples of youth. Of note, coping strategies accounted for more variance in both academic achievement and life satisfaction, with estimations of 13-20% and 23-32%, respectively. This study found that students who employ time and task management, sleep, and deterioration to cope experience better academic performance, while

those relying on seek academic support, skip school, social and creative diversions, substance use, reduce effort on schoolwork, and handling problems alone were less likely to be academically successful. Although time and task management was predictive of high achievement as anticipated from previous research findings, students who jeopardized their sleep and got upset or ruminated over academic demands also experienced high academic performance. This finding may be reflective of high-achieving students' desire to maintain high grades at all expenses, including sufficient hours of sleep, and concern for their academic work, influencing their angry emotional response to their workload that they diligently attend to. Additionally, students who employ cognitive reappraisal, turn to family, and social and athletic diversions were more likely to experience high life satisfaction, while those relying on creative diversions, reduce effort on schoolwork, handle problems alone, and deterioration were less likely to have optimal life satisfaction.

Given that this study is the first to examine developmental trends in environmental stressors and coping strategies to manage academic demands among high-achieving students in accelerated academic curricula, future research can replicate and extend this research to a more representative sample of youth (e.g., AP and IB students from across the U.S.) to determine if similar trends are observed.

Additionally, future studies could expand the longitudinal investigation by comparing high-achieving students' levels of environmental stressors and strategies to manage academic demands throughout high school (e.g., 9-12<sup>th</sup> grade). This would further disentangle the stability of stress and coping across high school, rather than comparing cohorts of students during the transition between 9<sup>th</sup> and 10<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup>, and 11<sup>th</sup> and 12<sup>th</sup> grade over a one-year timespan. Moreover, extended longitudinal investigations could examine the relationship between students'

stress and coping, and indicators of success over time to determine the extent to which specific responses to stress lead to academic achievement and subjective well-being.

Future directions in research on stress and coping in high-achieving youth could also incorporate other indicators of student success. The current study was restricted to exploring two indicators of success: semester GPA and life satisfaction. Future investigations may include other outcome variables such as AP and IB exam performance, cumulative high school GPA, academic burnout, psychopathology, and negative and positive affect, to create a more comprehensive picture of how stress and coping relate to academic performance and mental health among high-achieving high school students. Furthermore, they could explore the extent to which such indicators have curvilinear (versus linear) relationships with students' levels of stressors and coping strategies used.

Finally, future research could explore coping strategies as a moderator between academic stress and indicators of student success. By exploring the interaction effects, researchers could determine the extent to which use of specific coping strategies change the magnitude and direction of the relationship between academic stress and students' achievement and mental health. This could detect nuances in the relationship between stress due to academic requirements, and students' GPA and life satisfaction observed in the current study.



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## Appendix A: Study 6 Demographics Form

Spring 2011 (Study 6)      School: \_\_\_\_\_      Code #: \_\_\_\_\_

PLEASE READ EACH QUESTION AND CIRCLE **ONE** ANSWER PER QUESTION:

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
6. Are you currently taking Advanced Placement (AP) classes?      Yes                      No
7. In middle school, 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
8. Do you receive free or reduced-price school lunch?      Yes                      No
9. 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):* \_\_\_\_\_
10. My ethnic identity is:
  - a. American Indian or Alaska Native
  - b. Asian
  - c. Black or African American
  - d. Hispanic or Latino
  - e. Native Hawaiian or Other Pacific Islander
  - f. White
  - g. Multi-racial (please specify): \_\_\_\_\_
  - h. Other (please specify): \_\_\_\_\_
11. My father's highest education level is:
  - a. 8<sup>th</sup> 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
12. My mother's highest education level is:
  - a. 8<sup>th</sup> 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
13. My biological parents are:
  - a. Married
  - b. Divorced
  - c. Separated
  - d. Never married
  - e. Never married but living together
  - f. Widowed
14. Primarily, which adult 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):* \_\_\_\_\_

*Sample Questions:*

<i>When you are (or have been) faced with school-related problems or felt stress due to school situations, how often do you:</i>	Never	Sometimes	Often	Almost Always
1. Make flash cards	1	2	3	4

<i>How stressful has each situation been for you during the last month?</i>	Not at All Stressful or Not	A Little Stressful	Moderately Stressful	Quite Stressful	Very Stressful
1. Being caught in a traffic jam	1	2	3	4	5

## Appendix B: Study 7 Demographics Form

Spring 2012 (Study 7)    School: \_\_\_\_\_    Version: \_\_\_\_\_    Code #: \_\_\_\_\_    IB

1. Birthdate: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
(month)                      (day)                      (year)
2. I am in grade:                      9              10              11              12
3. My age is:                              13              14              15              16              17              18              19              20
4. My gender is:                      Male                              Female
5. In middle school, were you:
- a. in an IB school (MYP)?                      No                      Yes    Which school? \_\_\_\_\_
- b. in a magnet program?                      No                      Yes                      Which program? \_\_\_\_\_
- c. in Honors/advanced classes?                      No                      Yes
6. Have you attended your current high school since the start of 9<sup>th</sup> grade?
- a. Yes
- b. No                      c. If no, what grade were you in when you transferred to this high school?    9    10    11    12
7. Are you of Hispanic, Latino, or Spanish origin?
- e. No, not of Hispanic, Latino, or Spanish origin
- f. Yes, Puerto Rican                      d. Yes, Mexican, Mexican American, Chicano
- g. Yes, Cuban                              e. Yes, another Hispanic, Latino, or Spanish origin (*specify*) \_\_\_\_\_
8. My race/ethnic identity is: (*circle all that apply*)
- a. White    d. American Indian/Alaska Native
- b. Black or African American                      e. Native Hawaiian or Other Pacific Islander
- c. Asian    f. Other (*specify*): \_\_\_\_\_
9. My parents are:
- d. Married    d. Never married
- e. Divorced    e. Never married but living together
- f. Separated    f. Widowed
10. Which adult(s) do you live with most of the time?
- a. Mother and Father                              e. Father and Step-mother (or partner)
- b. Mother only    f. Grandparent(s)
- c. Father only    g. Other relative (*please specify*): \_\_\_\_\_
- d. Mother and Step-father (or partner)                      h: Other (*please specify*): \_\_\_\_\_
11. My father's highest education level is:
- e. 8<sup>th</sup> grade or less    e. College/university degree
- f. Some high school, did not complete                      f. Master's degree
- g. High school diploma/GED                      g. Doctoral level degree (Ph.D, M.D.) or other degree
- h. Some college, did not complete                      beyond Master's level
12. My mother's highest education level is:
- e. 8<sup>th</sup> grade or less    e. College/university degree
- f. Some high school, did not complete                      f. Master's degree
- g. High school diploma/GED                      g. Doctoral level degree (Ph.D, M.D.) or other degree
- h. Some college, did not complete                      beyond Master's level
13. About how long does it take you to travel from your house to school on most mornings?    \_\_\_ hrs    \_\_\_ mins
14. About how many times have you visited the school nurse's office this school year?    \_\_\_\_\_

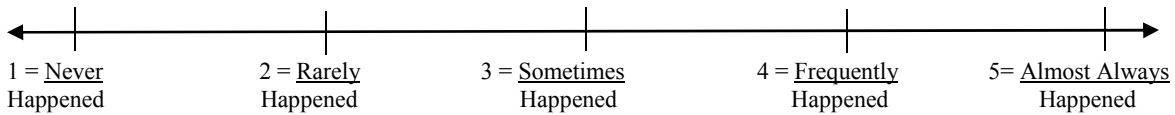
	None of Them	A Few of Them	About Half of Them	Most of Them	All of Them
15. How many of your friends are in an IB program?	1	2	3	4	5

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
16. I am satisfied with my school program (IB)	1	2	3	4	5

## Appendix C: Student Rating of Environmental Stressors Scale (StRESS)

### StRESS

**Instructions:** Listed below are events or situations that may be stressful for students. Please think about your experience with each event or situation this school year. For example, if you have not experienced the event or situation this year, bubble in 1 for “Never Happened,” but if the event or situation seems to happen every day or every week, bubble in 5 for “Almost Always Happened.”



<i>How <u>often</u> have you experienced the event or situation <u>this year</u>?</i>	Never	Rarely	Sometimes	Frequently	Almost Always
1. Conflict or arguments with teacher(s)	1	2	3	4	5
2. Family move	1	2	3	4	5
3. Problems related to romantic relationships, such as arguments with boy/girlfriend, breaking up, etc.	1	2	3	4	5
4. Separation or divorce of parents	1	2	3	4	5
5. Overly high expectations for achievement related to the reputation of your school program	1	2	3	4	5
6. Having teachers, administrators, or counselors who do not understand your culture or ethnic/racial group	1	2	3	4	5
7. Parents too involved with school (for example, check grades online too often, email or call teachers too often)	1	2	3	4	5
8. Pressure from peers to do risky behaviors, such as drinking, drugs, sex, etc.	1	2	3	4	5
9. Not getting enough help from teachers to learn or do well on assignments	1	2	3	4	5
10. Pressure to excel in school while involved in extracurricular activities	1	2	3	4	5
11. Having classmates who do not understand your culture or ethnic/racial group	1	2	3	4	5
12. Parents hassling and nagging you	1	2	3	4	5
13. High costs of high school, including fees, school supplies, special events, extracurricular activities, etc.	1	2	3	4	5
14. Problems with the representation of your culture or ethnic/racial group in textbooks and other materials in the classroom	1	2	3	4	5
15. Additional program requirements, such as extended essay, internal assessments, service hours, etc.	1	2	3	4	5
16. Tests or assignments that have a large impact on your grade	1	2	3	4	5
17. Disagreements between you and your parent(s)	1	2	3	4	5



18. Parents' overly high expectations for achievement	1	2	3	4	5
19. Difficult classes	1	2	3	4	5
20. Problems at your school, such as with the schedule, cafeteria/lunch, or building	1	2	3	4	5
21. New school policies, schedules, layout, etc.	1	2	3	4	5
22. Large amount of homework	1	2	3	4	5
23. Not enough money to do or buy the things that you want	1	2	3	4	5
24. Problems with friends or classmates, such as rumors, fights, gossip ("high school drama")	1	2	3	4	5
25. Change in who lives in your house, such as sibling leaving home, new person moving in, etc.	1	2	3	4	5
26. Insufficient time to sleep	1	2	3	4	5
27. Being surrounded by classmates that are exceptionally bright	1	2	3	4	5
28. Not enough free time or down time	1	2	3	4	5
29. Multiple tests and/or assignments due on the same day	1	2	3	4	5
30. Family financial problems	1	2	3	4	5
31. Family member's death or serious illness	1	2	3	4	5
32. Parents not understanding your school experiences and/or demands	1	2	3	4	5
33. Health issues	1	2	3	4	5
34. Pressure from parent(s) to stay in your high school program	1	2	3	4	5
35. Competition among students in your classes or program	1	2	3	4	5
36. Requirements to study a lot of information at once	1	2	3	4	5
37. Too little time (Feeling like there are "not enough hours in the day")	1	2	3	4	5

StRESS Factors:

F1. Academic Requirements= 5, 10, 15, 16, 19, 22, 26, 27, 28, 29, 35, 36, 37

F2. Parent-Child Conflict= 7, 12, 17, 18, 32, 34

F3. Academic and Social Struggles= 1, 3, 8, 9, 20, 21, 24

F4. Financial Problems= 13, 23, 30

F5. Cultural Issues= 6, 11, 14,

Major Life Events= 2, 4, 25, 31, 33

## Appendix D: Coping with Academic Demands Scale (CADS)

### CADS

**Instructions:** Many students face **challenges or stress due to school**. When this happens, students may react differently and do different things to make things better or to feel better about the way things are. For the items below, indicate *how often* you did each one **in response to school-related challenges or stress this school year**. There are no right or wrong answers, so please select the response that best reflects how often you react in each way during times of stress.

- 1 = Never (this means you do not ever respond to stress in this way)
- 2 = Rarely (this means you respond to stress in this way about a quarter of the time you feel stress)
- 3 = Sometimes (this means you respond to stress in this way about half the time you feel stress)
- 4 = Frequently (this means you respond to stress in this way about three-quarters of the time you feel stress)
- 5 = Almost always (this means you respond to stress in this way every or almost every time you feel stress)

<i>Think about the <u>current school year</u>. When you are (or have been) faced with school-related challenges or stress, how often do you:</i>	Never	Rarely	Sometimes	Frequently	Almost Always
1. Play videogames	1	2	3	4	5
2. Go over and over a negative situation in a conversation with a friend	1	2	3	4	5
3. Vent or complain to friends outside of your school program	1	2	3	4	5
4. Talk to parent(s) about what's bothering you	1	2	3	4	5
5. Go to church or place of worship	1	2	3	4	5
6. Panic or "freak out" about the problem without trying to fix it	1	2	3	4	5
7. Turn in assignments late	1	2	3	4	5
8. Watch TV or videos	1	2	3	4	5
9. Have fun with other people to get your mind off the problem	1	2	3	4	5
10. Take naps	1	2	3	4	5
11. Take a day off from school to get work done	1	2	3	4	5
12. Try to handle things on your own	1	2	3	4	5
13. Try to ignore feelings of stress	1	2	3	4	5
14. Vent or complain to parent(s)	1	2	3	4	5
15. Take part in enjoyable extra-curricular activities	1	2	3	4	5
16. Focus on the work until it is complete	1	2	3	4	5
17. Ask teacher(s) questions about assignments or coursework	1	2	3	4	5
18. Pray	1	2	3	4	5
19. Exercise (run, go to the gym, swim, dance, etc.)	1	2	3	4	5
20. Continue to think about your problem(s) even when doing other activities	1	2	3	4	5
21. Stop caring about schoolwork	1	2	3	4	5
22. Keep problems to yourself	1	2	3	4	5
23. Break work into manageable pieces	1	2	3	4	5
24. Think about the bigger picture (your goals or values) to put things in perspective	1	2	3	4	5
25. Tell yourself that you can do it, for example that you've managed similar situations before	1	2	3	4	5

26. Use a planner to keep track of activities and assignments due	1	2	3	4	5
27. Keep thinking about work to be done (obsess about workload)	1	2	3	4	5
28. Spend time with family	1	2	3	4	5
29. Talk to others to get your mind off the problem	1	2	3	4	5
30. Become quiet (talk less or not at all to others)	1	2	3	4	5
31. Study with other students	1	2	3	4	5
32. Get extra help for class from tutors	1	2	3	4	5
33. Take a day off from school to sleep or relax (a “mental health day”)	1	2	3	4	5
34. Write creatively (poetry, lyrics, etc.)	1	2	3	4	5
35. Yell, scream, or swear	1	2	3	4	5
36. Rely on your faith to help deal with the problem	1	2	3	4	5
37. Surf the Internet (YouTube, news websites, etc.)	1	2	3	4	5
38. Go shopping	1	2	3	4	5
39. Pursue a hobby or interest such as cooking, drawing, playing an instrument, etc.	1	2	3	4	5
40. Stop trying (give up)	1	2	3	4	5
41. Sleep to escape or put off the problem	1	2	3	4	5
42. Write about problems and feelings	1	2	3	4	5
43. Work less on or just don’t do assignments that are less important	1	2	3	4	5
44. Drink alcoholic beverages, such as beer, wine, liquor, etc.	1	2	3	4	5
45. Play team sports (basketball, soccer, football, crew, etc.)	1	2	3	4	5
46. Use drugs, such as marijuana, medications not prescribed to you, etc.	1	2	3	4	5
47. Skip school to avoid tests you are not ready for or assignments you have not finished	1	2	3	4	5
48. Adopt an optimistic or positive attitude	1	2	3	4	5
49. Talk to classmates (friends in your school program) about what’s bothering you	1	2	3	4	5
50. Get and keep materials for school organized	1	2	3	4	5
51. Take it out on other people (lash out, be mean, be sarcastic)	1	2	3	4	5
52. Get mad, annoyed, or irritated	1	2	3	4	5
53. Remind yourself of future benefits or rewards of finishing your school program, such as getting into college or getting scholarships	1	2	3	4	5
54. Be purposeful about how you schedule and spend all of your time	1	2	3	4	5
55. Sleep to recharge so you can tackle a problem	1	2	3	4	5
56. Smoke cigarettes or use other tobacco products	1	2	3	4	5
57. Prioritize the order in which you complete your work	1	2	3	4	5
58. Hang out with friends	1	2	3	4	5

CADS Factors:

F1. Time and Task Management= 16, 23, 26, 50, 54, 57

F2. Cognitive Reappraisal= 24, 25, 48, 53

F3. Seek Academic Support= 17, 31, 32

F4. Turn to Family= 4, 14, 28

F5. Talk with Classmates and Friends= 2, 3, 29, 49

F6. Skip School= 11, 33, 47

F7. Social Diversions= 9, 38, 58

F8. Athletic Diversions= 15, 19, 45

F9. Creative Diversions= 34, 39, 42

F10. Technology Diversions= 1, 8, 37

F11. Substance Use= 44, 46, 56

F12. Reduce Effort on Schoolwork = 7, 21, 40, 43

F13. Attempt to Handle Problems Alone= 12, 13, 22, 30

F14. Deterioration= 6, 20, 27, 35, 51, 52

F15. Sleep= 10, 41, 55

F16. Spirituality= 5, 18, 36

## Appendix E: Students' Life Satisfaction Scale (SLSS)

### 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 F: Study 6 Parent Consent Letter

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.
- ✓ **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

-----  
**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.

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

**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

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(813) 974-3246 • FAX (813) 974-5814

## Appendix G: Study 7 Parent Consent Letter

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. We are examining high school students in academically demanding college preparatory programs in order to understand what factors are linked to emotional wellness and academic success among youth 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 an International Baccalaureate (IB) Program and/or Advanced Placement (AP) courses.
- ✓ Why Your Child Should Participate: There is a great need for educators and researchers to understand what leads to school success and happiness for students in rigorous academic programs. The information that we collect from your child may help increase our overall knowledge of how factors such as stressors and coping strategies relate to academic, social, and emotional success among high-achieving students. 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, which we will use to inform our work with educational professionals. 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 will receive either a \$10 iTunes gift card or a pre-paid movie ticket to a local theater.
- ✓ What Participation Requires: If you grant your child permission to participate in the study, we will ask him or her to complete several paper-and-pencil surveys. These surveys will ask your child about his or her stressors and coping strategies; school-related attitudes and behaviors; personal academic engagement; relationships with classmates, teachers, and parents; thoughts about his or her personality and psychological well-being (happiness and emotional distress); and participation in extracurricular activities. 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. A final part of participation involves a review of your child's school records. School/district employees will provide the USF research team with the following information about your child: courses taken for high school credit, including grades earned in these courses as well as scores on AP and IB exams; scores on college entrance/readiness exams (e.g., PSAT, SAT, ACT); FCAT scores since middle school; student demographic characteristics including race/ethnicity, eligibility for free or reduced-price lunch, identification as an English Language Learner (ELL) or a student with an exceptionality; student distance from current high school (e.g., high school student is zoned to attend); extent of involvement in unique educational services, such as the AVID program, services for ELL students, and/or gifted education; district/state student ID numbers; student attendance and discipline history (i.e., number of office discipline referrals); number of community service hours completed; for 12<sup>th</sup> grade students: college acceptances and scholarships, and obtainment of IB diploma and/or IB certificate.
- ✓ 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.

- ✓ **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 five years after the study is complete. 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.
- ✓ **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, which coping strategies are associated with positive and negative outcomes, and which student characteristics and environmental factors are associated with success and risk in AP and IB courses. 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. The second copy of this letter is yours to keep.

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

**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.

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

**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 H: Study 6 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

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## Appendix I: Study 7 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” (Pro00001094). You will be asked to complete several surveys that inquire about stressors that you experience; the things you do to deal with those stressors; your attitudes towards your classes and schooling in general; your relationships with classmates, teachers, and parents; features of your personality; your happiness and emotional distress, and your participation in extracurricular activities. Completing these surveys will take you approximately 45-60 minutes. To thank you for your participation, you will receive your choice of either a pre-paid movie ticket or a \$10 iTunes gift card.

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

DEPARTMENT OF PSYCHOLOGICAL AND SOCIAL FOUNDATIONS • COLLEGE OF EDUCATION  
University of South Florida • 4202 East Fowler Avenue – EDU 105 • Tampa, FL 33620-5650  
(813) 974-3246 • FAX (813) 974-5814

## Appendix J: Institutional Review Board Approval of Studies



DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE  
Institutional Review Boards, FWA No. 00001669  
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799  
(813) 974-5638 • FAX (813) 974-5618

July 23, 2010

Shannon Suldo, PhD  
Psychological and Social Foundations  
EDU 105

RE: Expedited Approval for Initial Approval  
IRB#: Pro00001094  
Title: Intrapersonal Factors Associated with Academic Success among High School Students in Advanced Placement and International Baccalaureate (AP-IB) Programs

Dear Dr. Suldo,

On 7/23/2010 the Institutional Review Board (IRB) reviewed and **APPROVED** the above referenced protocol. Please note that your approval for this study will expire on 7/23/2011.

Approved Items:  
Consent/Assent Document(s):

<a href="#">Educator Consent Study 3 Educator Focus Groups.docx.pdf</a>	7/23/2010 2:15 PM	0.01
<a href="#">Parent Consent Study 1 Student Focus Groups.docx.pdf</a>	7/23/2010 2:15 PM	0.01
<a href="#">Parent Consent Study 2.docx.pdf</a>	7/23/2010 2:15 PM	0.01
<a href="#">Student Assent Study 1 Student Focus Groups.docx.pdf</a>	7/23/2010 2:15 PM	0.01
<a href="#">Student Assent Study 2 Individual Interviews.docx.pdf</a>	7/23/2010 2:15 PM	0.01

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

(6) Collection of data from voice, video, digital, or image recordings made for research purposes.

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

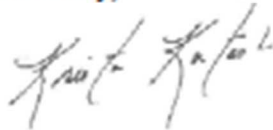
**Please be advised that this initial approval only includes subjects recruited from the Pinellas County School District. Data collection within Hillsborough, Pasco, Broward and Duval school districts cannot begin until approval letters from those school districts are provided to the USF IRB.**

Please note, the informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form. Valid consent must be documented on a copy of the most recently IRB-approved consent form.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-9343.

Sincerely,



Krista Kutash, PhD, Chairperson  
USF Institutional Review Board

Cc: Anna Davis, USF IRB Professional Staff