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One Year Impact of the Advancing Coping and Engagement (ACE) Program on Advanced Placement and International Baccalaureate Student Success

by

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

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ABSTRACT

Student success hinges on educational settings that feature a well-developed, comprehensive mental health support system (Hoover et al., 2019). Salient pieces of well-functioning mental health supports adhere to Multi-Tiered Systems of Support (MTSS) principles, including evidence-based practices with incremental intensity (Stoiber & Gettinger, 2015). Adolescents pursuing accelerated curricula in high school, specifically Advanced Placement courses (AP) and the International Baccalaureate Diploma Programme (IBDP), display a need for psychosocial support related to the stressors inherent to a rigorous curriculum (Suldo & Shaunessy-Dedrick, 2013b). Suldo and colleagues’ (2018) research on AP and pre-IBDP youth identified malleable predictors of success that became intervention targets for a preventative social-emotional skill-building curriculum. The Advancing Coping and Engagement (ACE) program targets 9th grade AP and pre-IBDP students and consists of universal components for students, parents, and teachers and a selective component for students with signs of academic or emotional risk (Shaunessy-Dedrick et al., 2022). After multiple years of iterative development and pilot testing, Suldo et al. (2022) conducted a randomized control trial of the ACE program with 547 9th grade AP and pre-IBDP students in 14 schools (15 AP/IB school programs) during the 2017-2018 school year. Researchers gathered academic and self-report social-emotional data from students' pre-and-post intervention on ACE program targets (coping, engagement, eustress) and student outcomes (academic and mental health). Post-intervention results showed promising coping, engagement, eustress, and mental health outcomes among students in AP and pre-IBDP programs randomized to the intervention condition as compared to
students in programs in the control condition (Ferron et al., 2021; Suldo et al., 2022). The researchers collected data for a follow-up assessment at one-year post-intervention (2018-2019 school year). At one-year post-intervention, 336 (61.4%) previous study participants completed the same surveys administered at post-intervention (self-report social-emotional data) and academic records provided data on course grades and test scores. This dissertation examined this data from the one-year follow-up assessment and found significant differences ($p<.05$) between the treatment and control group on affective engagement (belongingness at school; $d=0.29$), behavioral engagement (in-class participation; $d=0.24$), behavioral engagement (extracurricular activities; $d=0.23$), eustress ($d=0.38$), and externalizing problems ($d=-0.25$). The treatment effects that remained significant from post-intervention to one-year follow-up included affective engagement (belongingness at school), behavioral engagement (in-class participation), and eustress. Behavioral engagement (extracurricular activities) and externalizing problems were not significant at post-intervention but emerged as significant treatment effects in 10th grade. Significant treatment effects at post-intervention for affective engagement (in-class positive emotions), achievement motivation (value school), and academic burnout attenuated to non-significance at the one-year follow-up. Of note, significantly more students who received the ACE program continued participating in AP/pre-IBD classes in 10th grade than their control group counterparts (88% compared to 76%). However, a sizeable percentage of students in the treatment group (49%) and the control group (56%) demonstrate the need for additional support. Data from these analyses indicate that the ACE program is an intervention that has lasting positive treatment effects on multiple outcomes. Implications for practice, study limitations, and directions for future research are discussed.
CHAPTER ONE: INTRODUCTION

Statement of the Problem

A comprehensive school-based mental health system is necessary to support students' positive academic, behavioral, and social-emotional growth (Hoover et al., 2019). Schools are the best places to meet student needs as they provide the broadest access to services and conceptualize student functioning as an interplay between educational and psychological functioning (Hoover et al., 2019). Through the Multi-Tiered Systems of Support (MTSS) model, schools provide these resources to students by matching the intensity of the service with the level of need (Stoiber & Gettinger, 2015; Zins, 2004). A primary goal of the MTSS framework is to invest in prevention efforts (termed Tier 1 or universal support) so that students have the proper tools and resources to draw on in times of need (Stoiber & Gettinger, 2015).

The MTSS model focuses on supporting students academically and social-emotionally since both domains work concurrently to move a student in a positive or negative direction. Increased awareness of developmental cascades (Masten & Cicchetti, 2010) expanded student success into a multidimensional construct that includes academic and social-emotional domains (Hoover et al., 2019). Adolescents, in particular, must navigate an ever-changing social-emotional landscape but are overlooked as the target population for social-emotional learning (SEL) interventions (Yeager, 2017). Many adolescents typically identified for support are in the drop-out risk category or display disruptive behaviors, such as fighting (Hoover et al., 2019). However, a growing population of students in accelerated curricula encounter psychosocial challenges related to their chosen curricular option (Suldo & Shaunessy-Dedrick, 2013b).
Students can take college-level classes in high school through the Advanced Placement (AP) classes (College Board, 2022) or the International Baccalaureate Diploma Programme (IBDP; IBO, 2022), among other options (e.g., dual enrollment, the Cambridge Advanced International Certificate of Education [AICE] Program). However, these accelerated curricula options are associated with increased stress levels beyond typical high-school students' experiences (Suldo et al., 2013). It is necessary to address this increased stress in 9th grade because the college benefits derived from these programs come from years of succeeding in these classes (Callahan & Caughey, 2020).

In 2018, Suldo and colleagues identified malleable success predictors for AP and pre-IBDP students. These factors, such as approach-focused coping, engagement, and eustress (a positive stress response), are the intervention targets for a multi-faceted SEL program titled the Advancing Coping and Engagement (ACE) program. The ACE program uniquely supports 9th grade AP and pre-IBDP students through four universal components (student curriculum, teacher training, parent information, mid-year screening; Shaunessy-Dedrick et al., 2022; Suldo et al., 2019) and one selective component (motivational, assessment, planning [MAP] meeting; O’Brennan, 2020) for students at academic or emotional risk.

After multiple years of iterative development and pilot testing, Suldo et al. (2022) conducted a randomized control trial of the ACE program with 9th grade AP/pre-IBDP students in 14 schools (15 AP/IBDP school programs). Researchers gathered academic and self-report social-emotional data from students' pre-and-post intervention on proximal (intervention targets) and distal (academic and mental health) outcomes. Post-intervention results showed promising effects on coping, engagement, eustress, and mental health outcomes with six significant treatment effects and effect estimates in the desired direction for six of the seven engagement
variables, all coping variables, all mental health variables, eustress and academic burnout (Ferron et al., 2021; Suldo et al., 2022).

Continued documentation of the ACE program intervention targets and outcomes is necessary to understand the program's long-term effects. Follow-up assessments of SEL programs are sparse even though these interventions are prone to delayed effects, especially regarding prevented adverse outcomes (Greenberg & Abenavoli, 2017; van Loon et al., 2020).

Since the ACE program supports students at the start of their accelerated coursework journey, it is necessary to assess the trajectory of these identified positive factors over time. A one-year follow-up assessment, the focus of this particular study, is the first step in documenting the continual effects of the ACE program. In particular, this study assessed coping, engagement, and eustress intervention targets at one-year post-intervention since they are associated with positive educational and psychological outcomes.

For coping, examining individual strategies in both the effective and ineffective category provided information about what specific techniques students practice and use one year after the intervention. Data from students in the intervention group informed practitioners on what strategies students in the ACE program continue to use over time. These data provide guidance for educators on which coping strategies are well-developed and which may need to be reinforced or encouraged. Knowing the distribution of coping strategies used in the control group illuminated what strategies students without intervention learn on their own and what they typically rely on to handle their stress.

Like coping, engagement is another intervention target that showed promise at post-intervention. A picture of this skill at one-year follow-up identified which aspects of engagement were most salient in comparison to the natural development of engagement practices over time.
This longitudinal look at engagement helped explain if learning about the benefits of staying engaged in various ways drives students to remain involved/engaged even though it may feel harder in the moment.

Eustress, a positive stress response (O’Sullivan, 2011), is another factor that had promising results at post-intervention and aligned with positive student outcomes. Since AP/pre-IBDP/IBDP students experience increased stress (Suldo & Shaunessy-Dedrick, 2013b), they must experience motivating stress, eustress, instead of debilitating stress, distress. Assessing eustress in both the treatment and control condition at one-year post-intervention illuminates’ levels of eustress in 10th grade AP/pre-IBDP students and hints at if using these effective strategies increases a positive stress response. A one-year look at these intervention targets clarifies if knowing the long-term benefits of effective strategies boosts students' ability to push through temporary discomfort and implement effective strategies in the long term.

This study also evaluates intervention outcomes at one-year follow-up, including mental health (both positive and negative indicators; Suldo & Doll, 2021) and academic achievement. These distal outcomes are, in their nature, long-term outcomes and require a temporal view to provide a nuanced view of the effects of the intervention. Long-term assessment over multiple years provides the most complete picture of the trajectory of these outcomes. However, a one-year follow-up provides the first step in understanding the shape of these outcomes over time. Mental health indicators, including life satisfaction (positive indicator) and burnout and psychopathology (negative indicators), showed promise post-intervention (Suldo et al., 2022). Outcomes assessing indicators of academic achievement, however, did not associate with positive outcomes in the desired direction (Suldo et al., 2022). A one-year follow-up assessment
continued to investigate how the effects of the ACE intervention relate to these outcomes- GPA and AP test scores- over time.

A longitudinal view also provides examination of two additional indicators of the ACE program’s effectiveness: retention in accelerated curriculum and students’ need for support above the universal level. Because students derive college benefits from persistence in these programs (Callahan & Caughey, 2020), it is essential to measure retention over the years. While it is inevitable that some students do not want to continue with accelerated curricula, those that do continue must be provided adequate support along the way. A look at retention in AP/pre-IBDP classes in 10th-grade is the first glimpse at this factor in this population. Retention would be an impactful intervention outcome that would be especially desirable and motivating for schools to implement the ACE program.

While universal support should serve most students, a percentage of students will demonstrate risk factors that require an additional level of support (Stoiber & Gettinger, 2015). Suldo et al. (2019) validated a mid-year screening procedure to determine AP/pre-IBDP students needing further support. Analyzing the percentage of students identified as "at-risk" by this screening a year after the intervention can provide information related to the effectiveness of the ACE program in 9th grade. If fewer students than expected qualify as emotionally or academically "at-risk" one-year post-intervention, it would seem that the ACE program adequately served their needs. However, if a sizable number of students indicate a need for additional support, this information will assist with intervention dissemination and dosage recommendations.
Purpose of the Study

AP and IBDP students are a growing population that demonstrates the need for evidence-based support to successfully overcome the academic and emotional challenges inherent to the pace and requirements of rigorous curricula (Suldo et al., 2018). The ACE program, a multi-component SEL program, instructed 9th grade AP/pre-IBDP students in research-based factors tied to student success, including coping, engagement, and eustress (Shaunessy-Dedrick et al., 2022). Through a randomized control trial with 15 AP/IBDP programs from 14 schools (Suldo et al., 2022), researchers assessed participants pre-and-post intervention on proximal and distal outcomes related to educational and emotional success. Intervention targets such as coping, engagement, eustress, and mental health outcomes showed promise post-intervention (Ferron et al., 2021; Suldo et al., 2022). As with many SEL programs, some intervention outcomes are longitudinal and need follow-up assessments to capture the broader picture of the intervention effects. Follow-up assessments of SEL interventions are rare (van Loon et al., 2020), and various studies have painted a muddy picture of the persistence of intervention effects (Kam et al., 2004; Sklad et al., 2012; Top et al., 2016; Vassilopoulos et al., 2018). Follow-up effects on specific interventions are needed to provide practitioners with comprehensive data on the program’s effectiveness.

This study analyzed a one-year follow-up assessment of the multi-faceted ACE program to provide further information on the effectiveness of the intervention on proximal and distal outcomes. This study examined intervention targets such as coping, engagement, and eustress between the intervention and control groups at the one-year follow-up assessment. Other aspects of interest between groups also analyzed included the intervention outcome indicators of mental health and academic achievement. While a one-year follow-up assessment does not provide the
whole picture of intervention effects over time, these data one year out are the first indicators of how the intervention targets and outcomes trend over time. Further, two additional indicators of the ACE intervention effectiveness were assessed, including continued participation in the AP/pre-IBDP program in 10th grade and students’ need for support above the universal level (Tier 2) in 10th grade. Information on these other effectiveness aspects provided a dynamic view of the ACE program and contributes to understanding if the ACE program content needs reinforcement after 9th grade.

**Definition of Key Terms**

**Student Success**

Student success is a multi-dimensional construct defined by positive academic and psychological outcomes (Hoover et al., 2019). Students spend years within the educational setting, and their academic resume determines their access to future high-education and career options. A holistic view of student success focuses on both educational and psychological well-being since these domains are interrelated (Masten & Cicchetti, 2010). The present study represented academic success through unweighted grade point average (GPA) and passing AP exam scores. For psychological outcomes, complete mental health consists of indicators of both positive and negative psychological outcomes (Suldo & Shaffer, 2008). To that end, both positive indicators, life satisfaction, and negative indicators, burnout, and psychopathology, represented mental health outcomes.

**Multi-Tiered Systems of Support**

Multi-Tiered Systems of Support (MTSS) is the model used to address academic, social-emotional, and behavioral needs within the educational setting (Stoiber & Gettinger, 2015; Zins, 2004). Based on a public health model, the tiers define the levels of student support. Tier 1, often
referred to as the universal level in public health, is the core instruction given to all students. Approximately 80% of students should be supported by quality Tier 1 instruction (Stoiber & Gettinger, 2015). Tier 2 is equivalent to a selective level of intervention, which works to re-teach and practice skills taught in Tier 1. Approximately 20% of students should need this level of support (Stoiber & Gettinger, 2015). Tier 3 represents the highest level of support which is typically individualized and focused on skills remediation. Only 5% of students should need this intensive level of support (Stoiber & Gettinger, 2015). This tiered system of support aligns students' needs with proper levels of support and uses resources effectively by concentrating on Tier 1, or prevention efforts, to serve all students effectively (Hoover et al., 2019; Stoiber & Gettinger, 2015). A well-developed MTSS approach fosters student success in academics, social-emotional functioning, and behavior (Hoover et al., 2019). Within this study, support elements meant for universal dissemination are Tier 1 supports. Intervention elements that provide support beyond the Tier 1 level comprise Tier 2 or selective intervention components.

**Social-Emotional Learning**

Social-Emotional Learning (SEL) focuses on prevention and functions within the MTSS framework at the Tier 1 level. SEL refers to universal programs used to teach students social-emotional competencies, including self-awareness, self-management, responsible-decision making, relationship skills, and social awareness (CASEL, 2022). SEL programs should function within the school environment as necessary skills for educational development (CASEL, 2022). SEL programs are most effective when they target evidence-based success factors within their population of interest (Yeager, 2017).
Delayed Effects of Interventions

Delayed effects refer to intervention effects that appear after time has passed from the immediate completion of the intervention. While proximal outcomes may show change immediately after intervention termination, certain results may only show significant changes in longitudinal assessments, such as distal outcomes. SEL interventions are prone to delayed intervention effects because only time reveals the prevention of deleterious consequences (Greenberg & Abenavoli, 2017). Follow-up assessments, or ones with a temporal gap after intervention completion, are needed to determine intervention-specific effects over time.

Accelerated Curricular Options

Secondary schools are increasingly providing advanced-level, rigorous coursework for students to take throughout high school. These options allow students to pursue challenging curricula and receive future college benefits such as increased college acceptance, more selective college admission, and reduced college tuition through waived college credit (Callahan & Caughey, 2020). Most accelerated curricular options start in 9th grade with either a preparatory program or the actual college-level course. Advanced Placement (AP) classes and the International Baccalaureate Diploma Programme (IBDP) are two popular accelerated curricular options offered within the high school environment. Starting in 9th grade, students can take a select number of AP classes, with the menu of AP class options increasing in later grades. For IBDP in Florida, many students in 9th and 10th grade who intend to enroll in the IBDP complete the pre-IBDP program before formal entrance into the IBDP program in 11th grade (some schools offer the Middle Years Program to students in 9th and 10th grade who are intending to enroll in the IBDP). Even though AP classes and the IB program have different implementation styles, students in these programs face similar curricular and psychosocial challenges (Suldo &
Shaunessy-Dedrick, 2013b). Therefore, references to accelerated or rigorous curriculum refer to students in either AP classes or the IB program.

**Advanced Placement (AP).** AP classes are stand-alone year-long classes culminating in an end-of-year exam. The end-of-the-year exam, referred to as the AP exam, is often used by colleges/universities to determine if possible college credit may be awarded. Most states use a state-wide AP exam qualification score (3 or above) for college credit consideration (College Board, 2022, AP Cohort Data Report 2020); however individual secondary educational institutions ultimately decide if college credit is awarded based on AP exams scores. Only select AP courses are available for 9th-grade students, and course selection expands in the later high school years (College Board, 2022). Higher education institutions view AP classes favorably (Callahan & Caughey, 2020), and students can receive college credit for the classes in which they obtained a qualifying AP exam score.

**International Baccalaureate (IB).** The IB program has accelerated programs for elementary, middle, and high school students. The students intending to pursue the IB Diploma Programme (pre-IBDP) constitute the population relevant to this study. Even though students choose to pursue IBDP in 9th grade, they do not receive admittance into the program until 11th grade. In Florida, 9th and 10th grade students engage in a pre-IBDP program to prepare them for the requirements of the DP program. The pre-IBDP and the IBDP program include a structured progression of classes. Students must pass all curricular requirements, including a character development project and an extended essay, to obtain the IB diploma (IBO, 2022). The IB diploma carries college benefits such as increased admissions and waived core classes (Callahan & Caughey, 2020). Specific universities determine what benefits to award students who participate in the IB program but do not obtain the diploma.
**Advancing Coping and Engagement Program**

The Advancing Coping and Engagement (ACE) program is a multi-component SEL skill-building curriculum for 9th-grade students in an accelerated curriculum (Shaunessy-Dedrick et al., 2022). Foundational research with AP/IB students (Suldo et al., 2018) guided the ACE program’s targets—coping and engagement. In line with MTSS principles, the ACE program provides a Tier 1 (universal) and Tier 2 (selective) level of support. Tier 1 supports include four components including the student curriculum, teacher training, parent information, and a mid-year screening for academic and social-emotional risk (Shaunessy-Dedrick et al., 2022; Suldo et al., 2019). The Tier 2 support component includes the Motivational, Assessment, and Planning (MAP) meetings offered to students identified as “at-risk” at the mid-year screening (O’Brennan et al., 2020). Throughout this document, references to the ACE program include all five elements. The iterative development of the ACE program over four years of data collection and analysis in 18 high schools and included material development/refinement with stakeholders (year 1), implementation trial of the full intervention (year 2), evaluation of the program effectiveness (year 3), and the assessment of follow-up effects (year 4). Chapter 2 expands upon the foundational research of the ACE program and details the content and implementation of each component.

**Retention in Accelerated Curricula**

In this study, student academic success will be broadened from analysis of GPA and test score data to include retention in accelerated classes. Retention refers to continued enrollment in AP classes or the pre-IBDP program. Participation in accelerated curricula is voluntary, so students must decide to stay enrolled in the pre-IBDP program or add AP classes to their schedule every year. Research suggests that students who reap the maximum college benefits
perform well on the end-of-course AP exams or graduate with the IB diploma (Callahan & Caughey, 2020; Sadler, 2010). Skill-wise, students develop higher-level critical thinking and analysis skills with continued exposure to challenging and independent coursework (Callahan & Caughey, 2020). Continuous enrollment in AP classes or the IB program would be an especially salient metric of the ACE program's success to educators.

Research Questions

This study addresses the following research questions in the realm of intervention targets one year after completion of the ACE program.

1. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their utilization of:
   a) Approach-problem focused coping strategies (time and task management, turn to family, seek academic support, positive thinking, relaxation, turn to spirituality)?
   b) Alone/avoidance coping strategies (withdraw/rely on self, skip school, substance use, reduce effort on schoolwork, take shortcuts, sleep)?

2. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of:
   a) Affective engagement,
   b) Cognitive engagement,
   c) Behavioral engagement,
   d) Achievement motivation?
3. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of eustress?

This study addresses the following research questions in the realm of intervention outcomes one year after completion of the ACE program.

4. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in mental health outcomes including:
   1. Positive affect,
   2. Life satisfaction,
   3. Psychopathology,
   4. Academic burnout?

5. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in academic outcomes including:
   1. GPA,
   2. AP exam scores,
   3. Participation in AP classes and/or the IB program?

6. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their qualification for selective Tier 2 support (demonstrate academic or emotional risk factors) using the screening qualification validated in Suldo et al. (2019)?
Significance of the Study

A well-developed MTSS framework must employ evidence-based support that targets specific needs for students to succeed (Hoover et al., 2019). Until the development of the ACE program (Shaunessy-Dedrick et al., 2022), no SEL interventions targeted the specific psychosocial challenges experienced by students in demanding rigorous curricula. A randomized control trial of the ACE program with 14 schools (15 AP or IB programs) provided promising results on coping, engagement, eustress, and mental health outcomes immediately after intervention completion (Ferron et al. 2021; Suldo et al., 2022). While post-intervention assessments show changes in proximal intervention targets, follow-up assessments capture long-term effects, which interest many researchers and practitioners. However, many SEL programs do not employ follow-up assessments; for example, van Loon et al. (2020) report that only 30% of school-based adolescent stress reduction interventions conducted follow-up assessments. Research by Greenberg and Abenavoli (2017) indicates that follow-up assessments are necessary for SEL intervention evaluation because delayed intervention effects, especially around preventing adverse outcomes, tend to appear.

This study analyzed the follow-up effects of the ACE program one-year after the completion of the intervention. The significance of this study is two-fold.

First, a one-year look at the intervention targets and outcomes constituted an important step in building a comprehensive view of the ACE program's reach. Consistent evaluation of the ACE program has occurred from conception to implementing a randomized controlled trial (Shaunessy-Dedrick et al., 2022). Iterative evaluation of the ACE program has built an archive of data that allows a comprehensive view of the program. Reviewing the one-year follow-up data from the randomized control trial added to this trend of iterative evaluation of the ACE program.
Results from this follow-up assessment can be used in tandem with post-intervention data and other longer-term follow-up data to establish the trajectory of the intervention targets and outcomes. Data from this study allows educators to consider the long-term benefits of the ACE program when weighing the resources needed to employ the intervention.

Second, this study also contributes to the literature base on follow-up effects of SEL interventions. A small percentage of SEL interventions assess effects over time (van Loon et al., 2020), so this study contributed data on intervention targets and outcomes one-year post-intervention. Understanding the importance of follow-up intervention assessments and how they contribute to understanding the full intervention effects will help researchers decide whether to include a follow-up assessment in their research design.
CHAPTER TWO: REVIEW OF THE LITERATURE

Overview

A successful student excels in academics while maintaining positive mental health throughout their educational experience (Hoover et al., 2019; Masten & Cicchetti, 2010). Multi-tiered systems of support (MTSS) is the framework used to provide academic, behavioral, and social-emotional support to students in a way that balances the level of help with the severity of the need, to promote positive mental health for all students. MTSS focuses on prevention with Tier 1 supports and progressively increases support to students with continued challenges, with targeted Tier 2 and Tier 3 interventions. Social-emotional supports must provide a lasting impact on both a system and individual level. The goal is to have resource-efficient interventions that support students throughout their post-secondary academic endeavors. This support ultimately sets up students with skills that will positively impact their professional and personal trajectory.

Students who take accelerated curriculum during high school, particularly during their freshman year, face academic and psychosocial challenges beyond students in general education. Potentially malleable factors, such as problem-focused coping, motivation to achieve, and engagement, are positively associated with academic and social-emotional well-being among students in Advanced Placement (AP) and preparatory International Baccalaureate (IB) curricula (Suldo et al., 2018). This targeted research led to the development of a multi-component social-emotional program, the Advancing Coping and Engagement Program, hereby referred to as ACE. Researchers at the University of South Florida implemented the ACE program with 9th grade AP and pre-IBDP students in a randomized control trial. Immediate intervention effects of
the ACE program were assessed via self-report emotional indicators and academic performance (Ferron et al., 2021; Suldo et al., in progress), but long-term intervention effects beyond the school year in which students took part in ACE are unknown. Social-emotional programs are associated with lasting results and delayed effects (Greenberg & Abenavoli, 2017). The purpose of the current study is to investigate the longitudinal impact of the ACE program at one-year post-intervention. This longitudinal look at the ACE program illuminates the full effect of the program and contributes to the social-emotional intervention impact literature.

This chapter reviews recent literature surrounding the narrative above. First, the need for tiered levels of intervention within the educational setting is discussed. The structure of both Advanced Placement classes and the International Baccalaureate Diploma Programme and the unique predictors of success in this student population provide the ACE program’s basis. The ACE program, which comprises five support elements, and the post-intervention effects are described. The need for longitudinal assessment of the ACE program intervention targets compared to other longitudinal social-emotional programs concludes this chapter.

**Multi-Tiered Systems of Support for Mental Health**

In schools, the term “successful student” has evolved from a focus purely on performance to an expanded view of success that includes mental well-being as a separate yet equally important indicator of positive academic outcomes (Hoover et al., 2019; Roeser et al., 2000; Zins, 2004). Domains of functioning that were compartmentalized, such as mental health, academic performance, social functioning, are interrelated, as learning happens within the context of internal (emotional) and external (teacher, peer) relationships (Masten & Cicchetti, 2010; Zins, 2004). The bi-directional relationship between social-emotional functioning and
school performance shows that difficulties in a single domain significantly affect other areas of performance and well-being (Masten & Cicchetti, 2010; Suldo & Shaffer, 2008).

This inextricable link between mental health and academic outcomes supports the need for comprehensive school mental health systems. To support best practices in the provision of high-quality school mental health support, the U.S. Department of Health and Human Services, the Substance Abuse and Mental Health Services Administration, and the Health Resources and Services Administration developed a guidance document with feedback from practitioners, a variety of academic experts, and other educational stakeholders. The guidance document by Hoover et al. (2019) posits that schools are considered the most accessible place for a comprehensive mental health system to impact a large share of youth. Comprehensive school mental health systems involve a variety of systemic and school-level factors, including specialized school professionals, accessible resources, collaboration among educational and family stakeholders, fully developed MTSS practices, student identification of services through screening and referral, progress-monitoring data, and policies that provide funding for wrap-around services (Hoover et al., 2019). A fully functioning comprehensive school mental health system connects 70%-80% of youth needing mental health services with specialized educational professionals (Rones & Hoagwood, 2000).

The Multi-Tiered Systems of Support (MTSS) framework addresses student needs within a comprehensive mental health system. This tiered level of support applies to various domains, including academic, behavior, and social-emotional (Stoiber & Gettinger, 2015). The tiers continually use a prevention, screening, and intervention system. Universal interventions referred to as Tier 1 represent high-quality core instruction that teaches critical content, usually following standards aligned with successful outcomes. Effective implementers of Tier 1 differentiate
instruction to scaffold student learning. In theory, between 75%-80% of students should meet academic and behavioral expectations with high-quality Tier 1 instruction (Stoiber & Gettinger, 2015). Progress monitoring and screening measures identify the 20%-25% of students expected to need supplemental instruction. Tier 2 interventions provide opportunities for practice and targeted skill remediation and should “incorporate more exposure, more time, and more opportunities to learn” (Stoiber & Gettinger, 2015, p. 127). Students receive intensive Tier 3 interventions after receiving both Tier 1 and Tier 2 interventions. The approximately 5% of students who need this level of support receive increased intervention time through various resources. A specialized provider implements intense instruction with frequent progress monitoring (Stoiber & Gettinger, 2015).

The public health approach, which promotes tiered interventions, focuses on the interplay between the environment and the individual that sustains positive impacts for youth. Bronfenbrenner (1992) articulated that an intervention solely based on individual behavior change (similar to a Tier 3 intervention) is less effective compared to an intervention that captures both the individual and the environment (more aligned with a Tier 1 approach). With effective universal (Tier 1) and selective (Tier 2) supports, underlying vulnerabilities and environmental stressors may be halted before they develop into mental health problems. In a well-developed comprehensive school mental health system, students experience many positive effects such as better academic outcomes, access to care, early identification and intervention, positive school climate and safety, youth, family, educator and peer engagement, a continuum of services, and experience better psychosocial outcomes (Hoover et al., 2019). Comprehensive school mental health systems address the vast array of needs faced by different students and match those needs with evidence-based practices. While much research has focused on the needs
of students who are at risk for poor academic performance, there is a growing population of
students in accelerated academic courses that show unique needs. These students may perform
sufficiently well in prior courses to support promise of likely achievement in accelerated courses
yet struggle academically or emotionally during participation in accelerated curricula. A deeper
understanding of accelerated curriculum contextualizes students’ educational and psychosocial
experience in rigorous classes.

**Accelerated Curriculum in High School Students**

Advanced Placement (AP) courses and International Baccalaureate (IB) programs are
among the most popular options for accelerated curricula for high school students in Florida.
Schools that implement AP and IB programs have their curricula certified by the organization’s
accrediting body (College Board for AP and International Baccalaureate Organization [IBO] for
IBDP). These organizations also provide instructional resources such as professional
development for teachers that implement AP or IBDP curricula (College Board, 2022; IBO,
2022). These accelerated coursework curricula offer students learning experiences that embed
advanced concepts, above-grade-level content, and opportunities for college-level credit via end-
of-course exams (Finn & Scanlan, 2019; Hertberg-Davis & Callahan, 2014). The following
sections describe key features of AP classes and the IB program.

**Advanced Placement**

Since the introduction of AP courses in the late 1960s, these courses have become widely
available throughout the United States. They are the most common accelerated curricular option
for high school students seeking college credit by exam (Finn & Scanlan, 2019). Currently, 38
AP classes span seven subject areas: Arts, English, History and Social Sciences, Math and
Computer Sciences, Sciences, World Languages and Cultures, and Capstone (College Board,
The Capstone Diploma program, added in 2014, is the newest addition to the AP course offering and incorporates a comprehensive research component (Callahan & Caughey, 2020). This additional research component facilitates original research work and results in an AP Seminar and Research certificate (Callahan & Caughey, 2020).

AP classes have two components, the course itself and the AP exam given at the end of the class. Committees comprising college and high school level educators create the course framework for each AP class and the AP exam simultaneously over a two to six-year period. Each AP class framework is developed using the Understanding by Design ® backward planning model (College Board, 2022) and specifies the learning objectives for students. The methods and activities used to implement these standards throughout the year are designed by the classroom teacher and approved by the College Board (Callahan & Caughey, 2020). The course-specific AP exam assesses the knowledge gained from each AP class at the end of the spring semester. Each exam is scored on a scale from one through five, with a score of three or above recommended as the qualifying score to receive college credit for that course (College Board, 2020). As of Fall 2020, 31 states have implemented a statewide acceptance policy of qualifying AP exam scores (3 or above), while the other 19 states let the individual college or university determine what AP exam score will be accepted for college credit (College Board, 2022, AP Cohort Data Report 2020). This state-wide acceptance policy has grown 14% since 2015 (College Board, 2022, AP Cohort Data Report 2020). Only the AP exam score is considered when determining college credit. The quarterly or semester grades attained in the AP class are only used for GPA calculation and school-specific grade maintenance policies for participation in advanced classes. Select AP classes are offered as early as 9th grade, with course availability expanding as students’ progress through their high school careers. Recently, the College Board
implemented a Pre-AP program, offered in late middle school or early high school, to prepare students for AP classes. The Pre-AP program provides educators with course frameworks, instructional resources, assessments for learning, and collaborative educator workshops (College Board, 2022, Pre-AP). The Pre-AP classes apply critical thinking processes to grade-level work, such as “close observation and analysis, evidence-based writing, higher-order questioning, and academic conversation” (College Board, 2022, Pre-AP). While Pre-AP classes are not a pre-requisite for AP classes, these classes represent College Board’s response to equip students with academic skills necessary to succeed in AP classes, which present above-grade-level materials at a speedy pace.

The AP Cohort Data Report for 2020 (College Board, 2022, AP Cohort Data Report 2020) shows that in 2020, 1,213,760 students (38.3% of all graduates) in public schools nationwide took 4,109,003 AP exams. These data indicate students are likely to take multiple AP classes during the school year. Students in Florida had the second highest qualification exam rate (scoring a 3 or higher) of 34.2%, which surpassed the national exam qualification rate of 24.4%. Florida has increased its qualification exam rate by 12.6% in ten years. Even though these data show a positive trend, in 2020, 56.1% of students took an AP exam but only 34.2% obtained a score that could potentially qualify for college credit. This gap between participation in AP and exam qualification rates documents a need for support for this growing population to attain its academic goals.

**International Baccalaureate Diploma Program**

While AP courses are conceptualized as individualized courses, the International Baccalaureate (IB) program follows a specified course progression. The IB organization has four programs for different age groups that offer advanced learning opportunities from a global
perspective. The Primary Years Programme targeted students ages 3 through 12 and was first offered in 1997. The Middle Years Programme started in 1994 and addressed students ages 11 through 16. The oldest program, the IB Diploma Programme, began in 1968 and is implemented in 11th and 12th grade. The newest addition to the IB programs is the Career-related Program (started in 2012), which prepares high school students for various career pathways (IBO, 2022).

Students who took part in the ACE program described below were on track to enroll in the Diploma Programme, referred to as DP, and taking part in a pre-IBDP program, overseen by their school’s DP coordinator. The pre-IBDP is not an official program of IBO, but schools in Florida implement the pre-IBDP program to support 9th and 10th grade students’ successful transition into IBDP.

Achievement of the DP requires completion of three core elements, in addition to a series of courses in six domains: Studies in Language and Literature, Language Acquisition, Individuals and Societies, Sciences, Mathematics, and Arts. Students take between three and four higher level (HL) classes and various standard level (SL classes) throughout their high school career. The three core elements represent self-directed projects, including a theory of knowledge class (to understand research), the extended essay (an independent research project described in a 4,000-word paper), and a creativity, activity, service (CAS) project (IBO, 2022). With this project, students develop at least one element of creativity, action, or service within themselves. The IB requirements described above are met in 11th and 12th grade.

A points system determines diploma eligibility for students to successful graduate from IBDP. Points are awarded based on class performance and competence on core elements. Students receive a score from one through seven (seven being the highest) in each subject area based on an end-of-course written assessment. Students receive between zero and three points for
the core elements, Theory of Knowledge, and the extended essay. The CAS project is graded on completion and does not factor into the points calculation. To be awarded the IB diploma, students must receive between 24 and 45 points (45 points is the maximum; IBO, 2022, Assessment Principles and Practices- IB, 2017). From 2015 to 2019, higher education institutions have grown 37.9% in their recognition of the DP (Callahan & Caughey, 2020). The individual educational institution determines the translation of the IBDP courses into college credit. Students who do not complete the DP, but have taken classes within the program, may also receive college credit under the specific university policy. In Florida, there are approximately 90 schools, both public and private, that offer the DP program (FLIBS, 2022).

**Unique Experiences of AP/IB Students**

Most research on the benefits of accelerated classes focuses on these students’ self-reported experiences and academic products in college. Many students experienced positive educational outcomes and mixed psychosocial experiences within accelerated programs, as described in the subsequent paragraphs.

On the positive side, students taking AP and IBDP courses (N = 84 students from four diverse schools) reported they valued the increased quality of instruction delivered by a knowledgeable teacher (Foust et al., 2009). Beyond the traditional responsibilities of a general education high school teacher, AP/IBDP teachers have extra responsibilities and training related to the pedagogy of delivering advanced-level content. The level of dedication required by both student and teacher to succeed in these rigorous programs creates a prime environment for building strong relationships. Students reported having pride in their program and stronger relationships with students and teachers in the accelerated program (Callahan & Caughey, 2020).
Academically, students reported having a strong academic self-concept and felt most confident in critical thinking and writing skills (Callahan & Caughey, 2020). With the strong emphasis on research and original work, a requirement of IB, and an experience offered with AP Capstone, students have practiced these skills on lengthy assignments. Better college outcomes, such as college acceptance and persistence, were found for students in advanced classes.

Compared to a matched group of students, Coca et al. (2012) found that IBDP students demonstrated superior college outcomes, including college enrollment, reputable college acceptance, and college persistence. These researchers accounted for the contribution of students' prior academic skills to these positive academic effects. Previous test scores and grades did not significantly affect these desirable college outcomes, indicating that previous educational skills do not fully explain the positive academic outcomes associated with IBDP. For AP classes, the educational benefits of college were most impactful for students who obtained a qualifying score on the AP end-of-year exam (Callahan & Caughey, 2020). As noted above, a considerable percentage of students do not receive a qualifying score on the end-of-year exam. A study of over 2,000 high school students enrolled in AP classes or the IBDP program found that a large percentage (52%) of students did not obtain a qualifying score on any AP exams they took in a current school year, and 24.3% of students had a GPA below 3.0 during that school year (Suldo et al., 2018). Supports are needed to ensure more AP/IBDP students receive post-secondary benefits, including early college credit and reduced college tuition (Callahan & Caughey, 2020).

Students in these rigorous curricula also report struggles with these programs. The emphasis on the end-of-year exam, which determines college credit (AP) and points towards the IB diploma (IBDP), was reported as the most significant dissatisfaction for students (Callahan & Caughey, 2020).
In the psychosocial realm, students struggled to develop relationships with various peers and experienced high levels of stress (Callahan & Caughey, 2020; Suldo & Shaunessy-Dedrick, 2013a). Socially, while students reported strong bonds with peers within the program, they felt a disconnection with students in general education classes (Callahan & Caughey, 2020). Psychologically, students in rigorous academic curricula experienced significantly higher stress levels than their peers in general education classes (Suldo & Shaunessy-Dedrick, 2013b). Further, between 15% to 33% reported lower life satisfaction and mental health problems (Suldo et al., 2018). This significant stress level is primarily associated with the increased academic demands inherent to AP/IBDP coursework (Suldo et al., 2009). These academic demands, such as sheer workload and pressure to succeed (Feld, 2011; Milburn, 2011), differ from academic struggles that may be more typical to high school students, stressors such as poor grades, challenges understanding course content, or negative interactions with teachers.

The increased level of stress may be especially prominent in minority students (Callahan & Caughey, 2020). Traditionally, advanced-level classes have lacked appropriate diversity. The federal government recognized increasing diversity in advanced courses in 2012 (Callahan & Caughey, 2020). A $275 million government program was intended to relieve the financial burden of participating in these classes, by covering the fee required for each AP exam. For African American students, participation in these programs increased by 307% from 1999 to 2009 and 67% from 2009 to 2019 (Callahan & Caughey, 2020). For Latinx students, participation increased more rapidly, with enrollment expanding by 312% from 1999 to 2009 and 190% from 2009 to 2019 (Callahan & Caughey, 2020). However, increased participation in accelerated classes has not translated into substantial increases in qualifying AP exam scores, which is the strongest indicator of future success (Callahan & Caughey, 2020).
While students have increased access to rigorous courses, the next step is for educators to provide adequate psychosocial support for maintaining positive mental health (i.e., few symptoms of emotional distress, high levels of life satisfaction) while achieving educational benefits through AP and IBDP. To do this, the mechanisms that underlie success in this population must be understood. The following section details the research Suldo et al. (2018) conducted with AP/IB students.

Factors of Success in AP/IB Students

Because of the psychosocial impact of accelerated curricula, it is necessary to equip students with the proper support to receive the full benefits of AP and IBDP. Much research exists looking at predictors and various negative academic/emotional outcomes of general adolescent stress (Chappel et al., 2014; Duprere et al., 2015; Kaplan et al., 2005; Snyder et al., 2017). However, the unique stressors experienced by AP and IBDP students dealing with a rigorous curriculum have not been the focus of much research or intervention development. For students enrolled in these academically rigorous programs, Suldo et al. (2018) continued to build off previous research on AP/pre-IBDP/IBDP students (Suldo & Shaunessy-Dedrick, 2013b; Suldo et al., 2015) to pinpoint the factors associated with positive academic and mental health outcomes in this student population. In 2012, students in grades 9 through 12 who were enrolled in either AP classes, pre-IBDP (9th and 10th grade), or IBDP (11th or 12th grade) filled out surveys related to 34 predictors of success. These factors were grouped into different categories, including motivation (achievement), student engagement (cognitive, behavioral, affective), school support (classmate support, schoolwide academic support), family (authoritative parenting, home environment supportive of learning, parents value of achievement), coping (approach/problem-focused, diversions, avoidance, alone, rumination, organizational skills),
eustress, stressors (academic requirements, parent-child conflict, academic/social struggles, financial problems, cultural issues, major life events), demographic features, and student personal educational history (past completion of accelerated classes, academic skills as identified by grades and statewide exam performance). The above factors were examined related to specific mental health outcomes, including life satisfaction, psychopathology, and school burnout, and also academic outcomes such as GPA and exam performance. A total of 2,379 students comprised the research sample, with 1,229 students in IB programs and 1,150 students taking AP classes. Students lived in a single southeastern state and were recruited from 20 different AP and IB programs in five diverse school districts. Regarding mental health outcomes, correlational analysis reveal that higher levels of life satisfaction, and lower levels of psychopathology were associated strongest ($r \geq .20$) with higher levels of student motivation (life satisfaction $r=.38$; psychopathology $r= -.53$), cognitive engagement (life satisfaction $r=.33$; psychopathology $r= -.47$), affective engagement (life satisfaction $r=.34$; psychopathology $r= -.46$), classmate support (life satisfaction $r=.30$; psychopathology $r= -.41$), authoritative parenting (life satisfaction $r=.52$; psychopathology $r= -.52$), home support for learning (life satisfaction $r=.41$; psychopathology $r= -.37$), approach focused coping (life satisfaction $r=.29$; psychopathology $r= -.31$), and reduced use of avoidance coping (life satisfaction $r= -.22$; psychopathology $r=.39$), and rumination (life satisfaction $r= -.22$; psychopathology $r= -.40$). Overall, Suldo and colleagues (2018) found that student success in academic and mental health domains was associated with coping, particularly through use of problem-focused strategies, motivation to achieve, engagement (affective, cognitive), and authoritative parenting. Coping with academic stress through avoidance and higher levels of parent-child stress were associated with worse academic and emotional outcomes.
Educators recognize that academic success is tied to positive psychosocial functioning. Within this growing population of AP and IB students, these specific social-emotional needs are most appropriately addressed within the context of their accelerated classes. At the Tier 1 level, a contextually relevant social-emotional learning (SEL) program is needed to provide skill development in the appropriate areas for these adolescents. Given the aforementioned findings advanced by Suldo et al. (2018), the areas of relevance to students in AP and IBDP classes are likely to include strategies for coping with stress, increasing student engagement and motivation, and increasing authoritative parenting.

**Adolescent Social Emotional Learning (SEL)**

To support this holistic view of student success, interventions targeting social/emotional development are crucial to developing emotionally intelligent young adults. The Collaborative for Academic, Social, and Emotional Learning (CASEL; 2012) promotes five social and emotional competencies to promote positive youth development. Social and emotional learning (SEL) programs draw on the competencies of self-management, self-awareness, social awareness, relationship skills, and responsible decision-making. Hundreds of studies support the positive impacts of SEL on academic, social, and behavioral outcomes (Durlak et al., 2011; Sklad et al., 2012; Taylor et al., 2017; Wiglesworth et al., 2016). Findings from such studies indicate that students who received SEL interventions increased their academic performance by 11 percentile points (compared to students with no SEL instruction) and improved their ability to manage emotions, such as anxiety, that create learning interference (Durlak et al., 2011). The association between strong social-emotional skills and well-being persisted many years later, even in students with diverse backgrounds (Taylor et al., 2017).
Governmental bodies also recognize that schools should provide holistic support to students. In 2018, the Florida Senate passed Bill 7026, which provided schools with $69 million dollars in mental health funding. Students need simultaneous social-emotional and academic skill development to create an environment conducive to learning.

Research supports that the benefits gained from SEL far exceed the resources needed for implementation. These studies (Durlak et al., 2011; Sklad et al., 2012; Taylor et al., 2017; Wiglesworth et al., 2016) show that school time devoted to social-emotional learning complements academic development and provides students with 21st-century skills, such as self-direction and collaboration (Rotherham & Willingham, 2010), that allow youth to engage in future career and civic opportunities successfully. In line with this research, schools should look to integrate appropriate SEL programs to support multi-faceted positive development in youth.

Adolescence is an age group in particular need of SEL programs as this development period is characterized by new social roles, intense emotions, and increased independence (Yeager, 2017). They focus on a range of issues from academic failure and stress to teen pregnancy and teen smoking. SEL programs fall into different categories depending on their conceptualization of where impactful change will occur. The skills model works to strengthen a student’s skills, while the climate model targets changing the environment in which the student functions (Yeager, 2017). In line with the MTSS approach, the mindset model focuses on intervening in both areas by developing a climate conducive to growing/implementing taught skills. This model shows the most promise for lasting change (Yeager, 2017).

Universal SEL programs have produced beneficial outcomes, including being economically efficient as- in theory- effective Tier 1 interventions reduce the number of students who might later need more intense supports at the Tier 2 or Tier 3 level. However, Yeager
(2017) noted that typical adolescent SEL skill-building programs are “aged-up versions of childhood programs” (p. 74) and have more minor impacts on middle adolescent (ages 14-17) populations. A literature review of 29 mental health promotion programs and emotional well-being school-based interventions by O’Connor et al. (2017) found that these interventions had positive effects on youth; however, most of the interventions (18 studies) were delivered to youth in elementary school or middle school, with fewer studies of high school students. Durlak and colleagues (2011) found in their meta-analysis that only 13% of the SEL programs evaluated were high school-level programs. Because of the social and biological changes adolescents experience, SEL programs that are not tuned into the specific mechanisms underlying behavior in this state of development may demonstrate poor outcomes because they teach skills that may be less relevant to the positive effects they seek. For example, an anti-bullying intervention for elementary-aged students may work to develop social/emotional skills (based on the theory that they lack these skills), while bullying in older students may be done by socially savvy peers to gain popularity or attention (Yeager, 2017).

Most relevant to the AP/IBDP population are SEL interventions that target adolescent stress, particularly academic-related stressors. Throughout the years, research by Suldo, Shaunessy-Dedrick, and colleagues (Suldo & Shaunessy-Dedrick, 2013a, 2013b; Suldo et al., 2015; Suldo et al., 2018) demonstrated that AP, pre-IBDP, and IBDP students experience higher levels of stress as compared to high school students in general education. van Loon et al. (2020) conducted a multilevel meta-analysis to evaluate the effectiveness of different school-based intervention programs that aimed to reduce psychological stress in adolescents. The meta-analysis included 54 studies published from 1989 through June 2019 that met specific inclusion criteria. The inclusion criteria comprised seven elements- 1) school-based intervention in the
realm of promoting psychosocial functioning, 2) reported at least one self-report psychological stress outcome, 3) targeted adolescents, 4) compared an experimental and control group, 5) included assessments at pre-post intervention, and potentially follow-up, 6) written in English, and 7) had statistics conducive for performing a meta-analysis. The interventions in this meta-analysis employed a variety of techniques, including mindfulness (included in 19 studies), relaxation (included in 21 studies), and cognitive-behavioral strategies (included in 25 studies) to reduce stress. Regarding the study samples of the various interventions, 29 studies used a selected (self-selected/screened) sample, while 32 used community (students from the general population) samples.

The overall effect size of these 54 school-based intervention programs was moderate ($d=0.543, p<0.0001$), indicating the intervention programs effectively reduced stress (van Loon et al., 2020). van Loon et al. (2020) performed moderator analyses on psychological stress regarding the study, sample, and intervention characteristics. Within study characteristics, two factors emerged as moderators: the type of targeted stress and the measurement timing. Interventions targeting school stress showed significant effects. For measurement timing, follow-up assessments ($d=0.672$) produced a larger effect than post-intervention ($d=0.522$). Regarding sample characteristics, interventions with selected student samples (either screened or self-selected into the intervention) demonstrated significant effects. In contrast, community samples (students from the general population) did not demonstrate significant effects (van Loon et al., 2020). No intervention characteristics moderated the effects.

Taken together, the ingredients for an effective adolescent SEL program center on targeting the right skills within the specified population and creating a supportive environment for skills to develop. In examining the research by van Loon et al. (2020), it may be that
significant effects were found for the selected samples, as opposed to the community samples, because they were teaching skills of particular relevance to that specific population. Nevertheless, a MTSS approach to student success underscores the need to put in place salient supports at the universal/Tier 1 level, in addition to Tier 2 supports for selected samples of students with identified risk factors or early levels of problems.

Population intervention fit is critical for effective skill transfer/implementation for SEL adolescent programs. Before the development of the ACE program, no SEL intervention existed that was developed based on specific research with AP/IBDP students, targeted environmental academic stressors, and taught all the specific effective coping strategies found to be predictive of AP/IBDP student outcomes. The ACE program also adhered to other aspects surrounding successful intervention principles, including building a supportive environment through student engagement and intervening with other players within the student’s environment, including the teacher and parent.

To equip students in an accelerated curriculum to persist through a more challenging high school experience, they must have various salient tools to draw on in stressful times as well as to use in a preventative fashion. It is also necessary to provide these supports within the school setting. Being in the school setting helps students contextualize the practices and techniques, gives them relevant locations and opportunities to apply them, and increases access to services for ethnic minority adolescents (Stephan et al., 2007). The following section details the various components of the multi-faceted ACE program.

Advancing Coping and Engagement (ACE) Intervention

With funding from the Institute of Educational Sciences (IES; grant R305A150543), researchers at the University of South Florida developed a social-emotional skill-building
prevention curriculum for 9th grade AP and pre-IBDP students, titled the Advancing Coping and Engagement for AP and IB students (ACE) program. The ACE intervention was based on research that examined predictors of success for AP and pre-IBDP students (Suldo et al., 2018). This foundational research identified plausible intervention targets, including building effective coping strategies, and promoting strategies for increasing affective and behavioral engagement. Best practices in intervention development, including being research-based, consulting with content experts, gathering frequent feedback from stakeholders, and conducting pilot testing of various elements, were employed to develop the ACE intervention (Shaunessy-Dedrick et al., 2022). The IES grant funded four years of data collection to iteratively develop, refine, and evaluate the ACE intervention with respect to immediate and long-term outcomes. An overview of the four-year project stages is in Table 1.

**Table 1:**

*Stages of Development Grant R305A150543*

<table>
<thead>
<tr>
<th>Grant Year</th>
<th>Calendar Year</th>
<th>Purpose</th>
<th>Activities</th>
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| 1          | 2015-2016     | Develop intervention materials | • Develop intervention materials within the research team in consultation with content experts  
• Refine materials with relevant stakeholders (1 IB program, 1 AP program) |
| 2          | 2016-2017     | Implementation trial of full intervention | • Implement 5 components of the ACE program with 2 high schools (1 IB program, 1 AP class) that were different from grant year 1  
• Gather additional acceptability data from stakeholders  
• Further refine materials based on feedback  
• Finalize ACE program materials |
| 3          | 2017-2018     | Evaluate program effectiveness in a pilot | • Execute randomized control trial (RCT) including 15 high schools (8 intervention, 7 control) across 3 districts  
• Collect efficacy data pre-post intervention |
| 4          | 2018-2019     | Assess follow-up effects | • Recruit participants from grant year 3 for follow-up study  
• Gather 1-year follow-up data from participants  
• Examine outcomes of intervention vs. control schools |
ACE comprises five components: the universal programming includes (1) a student curriculum, (2) teacher training, (3) parent information, and (4) a mid-year screening; the targeted programming includes (5) motivation, assessment, and planning (MAP) meetings for students identified in the mid-year screening. Each of these components is described fully in the following paragraphs, with information drawn from Shaunessy-Dedrick et al. (2022; components 1 – 3), Suldo et al. (2019; component 4), and O’Brennan et al. (2020; component 5).

**Student Curriculum**

The Tier 1/universal student curriculum comprises 12 modules (10 core modules and two optional additional modules) designed to be delivered through the fall and early spring semester to all students through a designated class, most typically IB Inquiry Skills or AP Human Geography. Each student module can be completed in 45-50 minutes (a typical class period), ideally by the classroom teacher (in the ACE pilot program in the 2017-2018 school year, the student modules were co-facilitated by an ACE research team member and the classroom teacher). Each module has a PowerPoint presentation, facilitator script, and student handout packet. A variety of pedagogical techniques, including didactic learning, individual reflection, group work, activities (scenarios, role play), and future planning, are incorporated into each module (Shaunessy-Dedrick et al., 2022). Table 2 provides an overview of the focus of each of the student modules.

The foundational pieces underlying the ACE program, including the characteristics of advanced curriculum and specific research with AP/IB students, are captured in Modules 1 and Module 2. Module 1 focuses on introducing students to the ACE program, delivering psychoeducation about stress, and providing insight into the unique features of the AP/IB program. Students learn the difference between AP/IB courses versus the expectations of middle
school and typical high school classes and learn about the benefits of AP/IB programs from college students who recently took part in advanced curricula. Module 2 describes the targeted research that underscores the ACE program. Participants learn about the critical features that research identifies as characteristic of a successful AP/IB student and a struggling AP/IB student, specifically in the realm of engagement and effective coping strategies. The Coping Chart introduced in Module 2 groups coping strategies by their relationship with student outcomes, namely academic and emotional. Coping strategies that align with both positive outcomes are referred to as effective. Strategies that align with adverse educational and mental health outcomes are described as ineffective. Last, outcomes associated with one positive outcome and one negative outcome, for example, related to academic success but poor mental health, are categorized as mixed effectiveness. Students learn skills to implement effective coping strategies and limit use of ineffective strategies in later modules (Shaunessy-Dedrick et al., 2022).

Modules 3 through 5 focus on developing various aspects of engagement. Module 3 aims to increase overall school pride and have students narrow their focus on how their AP/IB program will help them reach their individual future goals. For example, the last activity in the module has students identify how taking part in an advanced curriculum will help them achieve their short-term/long-term personal goals in social, academic, career, and life. In Module 4, students learn about increasing their network of support by developing positive relationships with teachers and others in their school community. After instruction/demonstration in relationship development skills, students engage in an independent practice activity where they map how to make connections with individuals of their choice (identifying who, when, what to share, and noting progress). The last engagement module (Module 5) focuses on behavioral
engagement, specified as extracurricular activities for this population. Students learn about the positive outcomes of extracurricular activity involvement and complete a self-assessment of their current extracurricular activity involvement. Students discuss resources around overcoming access, personal, and social barriers to extracurricular activity involvement, for example, finding a club that meets during the school day if staying after school is not logistically possible (Shaunessy-Dedrick et al., 2022).

**Table 2:**

*ACE Student Modules*

<table>
<thead>
<tr>
<th>Foundational Knowledge</th>
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<tbody>
<tr>
<td>Module 1: Adjusting to AP/IB</td>
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<tr>
<td>Module 2: Factors Related to AP/IB Students’ Success, Spotlight on Coping and Engagement</td>
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<tr>
<th>Engagement</th>
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<tbody>
<tr>
<td>Module 3: Student Engagement -Increasing Pride in Your School and AP/IB Program</td>
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<tr>
<td>Module 4: Student Engagement -Relationships with Teachers, Peers, and Others at School</td>
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<td>Module 5: Investing in Extracurricular Activities</td>
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<tr>
<th>Coping Strategies</th>
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<tr>
<td>Module 6: Coping with Stress through Time and Task Management (Organizing Your Task List)</td>
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<td>Module 7: Coping with Stress by Focusing on the Work and Limiting Procrastination</td>
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<tr>
<td>Module 8: Coping with Stress by Seeking Support from People at Home, School, and Spiritual Community</td>
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<tr>
<td>Module 9: Coping with Stress through Relaxation and Positive Thinking</td>
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<td>Module 10: Limiting Use of Ineffective Coping Styles</td>
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<th>Booster Modules (Focus on Positive Psychology)</th>
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<tr>
<td>Module 11: Promoting Eustress &amp; Review of Coping and Engagement Tools</td>
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<tr>
<td>Module 12: Strengths, Values, and Goals</td>
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Modules 6-10 expand on the coping chart introduced in Module 2 and provide practical strategies for implementing effective coping styles and limiting ineffective coping techniques.
Modules 6 through 9 focus on developing skills in effective coping strategies: Time and Task Management, Seeking Support (home, school, spiritual community), Relaxation, and Positive Thinking. Modules 6 and 7 address two different aspects of time and task management. Module 6 focuses on five core time and task management skills: organizing materials, listing activities, breaking large tasks down into steps, managing time, and prioritizing tasks. Students engage in various hands-on learning such as completing a self-assessment to learn their time and task management strengths and weaknesses and practicing breaking down a significant assignment into manageable pieces. Module 7 addresses the last core time and task management skill-focusing on tasks until they are complete and limiting procrastination on academic tasks. Students receive time and task management tips and tools resources that help them plan out a path to achieving a personal time and task management goal. Module 8 encompasses strategies that address three effective coping strategies including: turning to family, seeking academic support, and turning to spirituality. In this module, students develop a web of support that incorporates people from different areas of their life, specifically home, school, spiritual community, they can turn to when they are experiencing school-related stress. The modules on engagement, specifically developing relationships, were purposefully administered before this module so that students could start building or adding to their current network of support. Module 9 tackles the remaining two effective coping strategies- relaxation and positive thinking. Students practice techniques in mindfulness (being consciously aware of thoughts, feelings, and behaviors), relaxation (progressive muscle relaxation, deep breathing), and positive thinking (positive self-talk, reframing negative thoughts). Module 10 addresses the ineffective coping styles, such as avoidance and withdrawal/self-reliance, and teaches students how to problem-solve limiting ineffective strategies while incorporating more effective techniques into their
coping repertoire. Module 10 ends with a summary of all coping/engagement strategies taught and has students design a plan for consistent implementation of effective coping styles (Shaunessy-Dedrick et al., 2022).

Modules 1 through 10 incorporate the core ACE program content, with delivery occurring during the fall semester. Modules 11 and 12 are recommended for use but optional, and are conceptualized as booster modules meant for implementation at the beginning of the spring semester. The booster modules promote positive psychology tenets, such as savoring and a strengths-based approach, that complements effective engagement and coping strategies (Shaunessy-Dedrick et al., 2022). Students in the ACE pilot program (2017-18 academic year, findings reported later in this paper) received all 12 modules following the timeline mentioned above.

Due to the time elapsed between the foundational core modules and the booster modules, Module 11 reinforces the concept of stress, the positive and negative aspects of stress, and the physical manifestations of these different states. The characteristics of eustress, the positive stress response, are explored, and students learn how to use the problem-solving process to promote eustress. Savoring (appreciating and enhancing positive experiences [Bryant & Veroff, 2007]) techniques, for example, sharing with others, and building positive memories, are shared with students for use when they feel motivated/energized by a stressor. The ACE student curriculum ends with Module 12, which explores students’ strengths, values, and goals. Goals become accomplished when students draw upon their character strengths in achieving them, and they feel satisfied when the goals align with their values. Within Module 12, students identify their top values, most vital character strengths, and short/long-term goals (Shaunessy-Dedrick et al., 2022). Students selected for the Tier 2/selective intervention- Motivation, Assessment, and
Planning [MAP]- will further discuss their strengths, values, and goals within an action plan that targets an area of growth.

**Teacher Training**

The 12 ACE student modules were designed to be delivered in a co-facilitation model (ACE research team member and classroom teacher) or solely by the classroom teacher (with consultative support from an ACE research team member). To prepare the classroom teacher, or other designated school-based facilitator, for module delivery, a series of 12 online webinars (housed on an online learning management system) scaffolded implementation. This targeted, accessible, and comprehensive teacher training represents efforts towards potential universal dissemination (Shaunessy-Dedrick et al., 2022).

Teachers are instructed to complete each training module approximately one week before the student module delivery. Each teacher training module provides the main objectives of the student module with sample activities, offers an interactive discussion post about the topic at hand, and, if applicable, summarizes the teacher-led portion in the co-facilitation module. Last, a knowledge check is administered at the end of the module to ensure an adequate understanding of the student module content (Shaunessy-Dedrick et al., 2022).

**Parent Information**

Parents, or caregivers of students taking AP/IB classes, round out the universal component of the ACE program. The ACE parent program comprises two in-person parent modules and 12 parent flyers accompanying each module (Shaunessy-Dedrick et al., 2022). The first parent module (intended to be delivered close to the initiation of the first student module) aims to introduce parents to the ACE program and provide knowledge and language to reinforce the content taught in the student module. Parents are educated on common responses to stress in
AP/IB classes, effective ways to cope with this stress, and ways to increase school engagement through relationships and extracurricular activities. The second parent informational session, which can occur at any point during the fall semester, specifies features in the home environment that relate to success in AP/IB classes, specifically home environments conducive to learning and authoritative parenting practices. Besides the specific parent modules, families receive an electronic flyer each week that summarizes the content learned by their child in the student module and tips and tools to implement these practices at home (Shaunessy-Dedrick et al., 2022).

In grant year 2, Shaunessy-Dedrick et al. (2022) explored the acceptability of all three components with relevant stakeholder groups. All stakeholders—students, parents, teachers—used a Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree) to rate the ACE intervention components to which they were exposed in terms of perceived usefulness. Mean scores of 4 or higher indicated high acceptability (Shaunessy-Dedrick et al., 2022).

For the student curriculum, a total of 331 students provided data regarding the ease of understanding the material (question 1), if the material was appropriate for the timeframe (question 2), and the likelihood of using the strategies learned (question 3). For questions 1 and 2, all 12 modules received a mean score above 4 (Shaunessy-Dedrick et al., 2022). On question 3, Modules 6-12 received a score above 4, while Modules 1-5 received a score between 3.75 and 3.98 (Shaunessy-Dedrick et al., 2022). Students rated the likelihood of employing effective coping strategies the highest.

Teachers that participated in the ACE program (N=11) rated the appropriateness of the teacher materials for AP/IB students as highly acceptable (M=4.91). Similarly, teachers rated the
ACE student curriculum as highly acceptable for improving intervention targets (mean scores ranged between 4.82 and 5.00; Shaunessy-Dedrick et al., 2022).

For the parent modules, ten parents rated module 1, and 16 parents rated module 2. Parents rated aspects of both module 1 (scores ranging from 4.40 to 4.70) and module 2 (scores ranging from 4.00 to 4.25) as highly acceptable (Shaunessy-Dedrick et al., 2022).

Overall, all stakeholders rated the various universal components of the ACE program in which they participated as highly acceptable.

**Mid-Year Screening**

Suldo et al. (2019) developed a mid-year screening tool to identify students needing additional support upon conclusion of participation in ACE. The mid-year screening comprises self-reported emotional indicators and academic data. In particular, students fill out a 1-page 16-item survey that contains the Perceived Stress Scale (PSS; Cohen et al., 1983) and questions that comprised the School Satisfaction Scale on the Multidimensional Students Life Satisfaction Scale (MSLSS; Huebner, 1994). Academic data, precisely unweighted fall GPA from the first semester of high school and the grade earned in a particular AP/IB class (typically AP Human Geography or IB Biology) is collected and analyzed with the self-assessment data.

In grant year 2, Suldo et al. (2019) validated the multi-method screening procedure in a sample of 304 AP/pre-IBDP students (133 students in a pre-IBDP program and 171 students in an AP program). Results from both data sources categorized participants into two groups- either at-risk or not- on three domains: stress, engagement, and academic performance. To be classified as at-risk in the stress domain, students had a PSS score > 3.6 (the average PSS score reported by previous AP/IB students ranged from 2.77 to 3.09 [Suldo & Shaunessy-Dedrick, 2013a, 2013b]). Regarding engagement, students scoring < 3.4 on the School Satisfaction Scale on the
MSLSS were considered at-risk (the average school satisfaction score in previous AP/IB students ranged from 3.93 to 4.13 [Suldo & Shaunessy-Dedrick, 2013a, 2013b]). In examining academic performance, both academic variables delineated students considered at risk (fall semester GPA < 3.0 or a grade of C or lower in designated AP/IB course). The ACE research team invited students classified “at-risk” in at least one domain to take part in MAP.

Using this data from grant year 2, Suldo et al. (2019) determined that 38.5% (117 out of 304 students) met risk thresholds in at least one area of stress, engagement, or academic performance. Most commonly, students were classified as at-risk in only one area (27.6%), with a lower percentage of students having two risk factors (8.9%) and an even smaller group identified as having all three risk factors (2%). This multi-method screening method identified more at-risk students (39%) than the more traditional teacher nomination (25%; Suldo et al., 2019). Teachers were more accurate in identifying students whose risk factors were academic rather than involved emotional well-being, likely because GPA/course grades are a tangible indicator of performance and compare peers. Universal screenings, especially emotional risk, are not standard in the school setting (Eklund et al., 2017). This multi-method screening procedure provides a useful tool for educators to identify separate and combined emotional and academic risk in AP/IB students.

**Motivation Assessment and Planning (MAP) Meetings**

While prevention focuses on the universal skill-building student modules, principals of Multi-Tiered Systems of Support (MTSS) demonstrate the need for a continuum of services for students who need additional instruction and support implementing social-emotional skills (Doll, 2019). The Motivation, Assessment, and Planning (MAP) intervention is the selective component of the ACE program designed to support students needing additional help in
implementing the skills taught in the Tier 1 piece. MAP incorporates principles of Motivational Interviewing (MI; Miller & Rollnick, 2013), which are gaining popularity in school-based mental health interventions for at-risk youth (Herman et al., 2014; Rollnick et al., 2016; Snape & Atkinson, 2016). Students identified by the mid-year screening take part in the MAP intervention in the spring semester after delivery of all student modules.

As described in O’Brennan et al. (2020), in grant year 2 the MAP intervention was delivered by ACE research team members. The intervention comprised four steps: 1) pre-MAP assessment, 2) MAP Meeting 1, 3) Reminder letter, and 4) MAP Meeting 2.

The pre-MAP assessment is a 148-item assessment that measures “coping strategies, eustress, affective engagement, behavioral engagement, cognitive engagement, achievement motivation, and authoritative parenting” (O’Brennan et al., 2020, p. 24). The MAP coach enters the student’s responses into a computerized scoring system which graphs their responses against a previous sample of AP/IB students (Suldo et al., 2018).

Students meet with a MAP coach for a 50-minute one-on-one meeting. MAP coaches bring the individualized score report and the strengths, values, and goals worksheet completed in Module 12 to the session. MAP coaches use a protocol that facilitates discussion through four MI stages: engage, focus, evoke, and planning. After learning about a student through their strengths, values, and goals (engage), students examine their individualized score report and pinpoint areas for growth (focus). Once students identify a growth area, the facilitator asks questions to evoke change talk (evoke) and help develop an action plan (planning).

Between MAP Meeting 1 and Meeting 2, students receive a reminder letter from their MAP coach that includes a summary of their goal, and the self-identified action steps needed to
reach it. The letter has reflection questions to provoke motivation, such as “What are three good things that would happen if I reached my goal this week?” (O’Brennan et al., 2020, p.26).

MAP Meeting 2 occurs approximately a month after the initial MAP meeting. In this meeting, the MAP coach applies the same four MI stages with the student’s progress on their original goal. In the focus stage, students either continue planning steps to achieve their initial goal, create a plan for a new goal, or savor the success of reaching their goal from Meeting 1. All MAP coaches end the meeting by providing any requested resources from the ACE program and school-based resources for any further academic/emotional support.

O’Brennan et al. (2020) evaluated the acceptability and usability of the MAP intervention in a sample of 49 9th grade students (a subset of students from grant year two, all identified as at-risk in the aforementioned screening procedure). Students, MAP coaches, and school mental health service providers completed acceptability surveys of the MAP intervention. All participants rated the acceptability surveys on a Likert scale from 1 = strongly disagree to 5 = strongly agree, with positive responses classified as a four or five. For MAP Meeting 1 and Meeting 2, respectively, students (M=4.47, M=4.42) and coaches (M=4.02, M=4.27) indicated high acceptability ratings (O'Brennan et al., 2020). Students' qualitative responses indicated they valued the opportunity to visually examine their levels of coping and engagement compared to a salient reference group (44.8%), found the action plan process very beneficial (28.6%), and enjoyed the personalized discussion of their graph (24.5%; O'Brennan et al., 2020). The MAP coaches revealed a strong working alliance with students (100%) and found value in connecting with students through strengths, values, and goals (71.4%; O'Brennan et al., 2020). School mental health providers rated the MAP program as highly acceptable (M=4.51).
In summary, the multi-faceted ACE program comprises five components that provide universal and targeted support for 9th grade AP/pre-IBDP students. If students received adequate support, they should demonstrate usage of the intervention targets—engagement, eustress, coping—and report associated positive indicators in academics and mental health. Indicators of these constructs are discussed in the context of successful outcomes.

Outcomes Salient to the ACE Interventions

With the infusion of college-level classes in the secondary education environment, students can engage in rigorous curriculum starting in 9th grade. To receive the full benefit of AP classes and the IB program in the post-secondary setting, students need to continue functioning successfully in these accelerated courses throughout their high school careers. Continued participation in AP compounds benefits by providing the opportunity for multiple college credits, while the IB program gives benefits with completion of the diploma program. This shift of accelerated classes offered at the entry point of high school necessitates the need to arm students with a robust support system and effective coping skills to navigate high-stress levels at the beginning of their high school career. Students who desire a challenging curriculum should be instructed in the skills needed for them to persist and flourish in it. The outcomes to examine in relation to student participation in an intervention tailored to the AP/IB context include the proximal targets of the intervention and the distal domains of functioning relevant to student success, namely mental health, and academic achievement.

Intervention Targets

Previous research by Suldo et al. (2018) detailed the profile of a successful AP/pre-IBDP student through the whole-child lens. Engagement and coping, described below, emerged as an important part of student success in rigorous classes.
**Student Engagement and Motivation.** Student engagement is a broad term that encompasses three different engagement subtypes: behavioral, affective, and cognitive (Reschly & Christenson, 2012). Affective engagement encompasses positive emotions towards school, cognitive engagement encompasses internal strategies used for success, such as goal setting, and behavioral engagement includes participation in school-related activities. Suldo and colleagues (2018) research indicated moderate correlations between affective engagement and cognitive engagement and desirable mental health outcomes (life satisfaction $r=.34, .33$; psychopathology $r=-.46, -.47$; school burnout $r=-.38, -.35$). While behavioral engagement yielded a lower association with these outcomes, this piece of engagement is the action step that may lead to increased affective and cognitive engagement. Motivation is another piece that falls under engagement. In a qualitative study with AP/IB students (n=30), achievement motivation emerged as a critical piece of academic success and an impetus to draw on their web of support (Suldo et al., 2015). Achievement motivation correlated positively with mental health outcomes (life satisfaction $r=.38$, psychopathology $r=-.53$, school burnout $r=-.48$; Suldo et al., 2018).

**Coping.** How students cope with academic stress was the second factor of success, which has been found in other adolescent populations (Reis et al., 2005; Skinner & Pitzer, 2012; Suldo et al., 2018). Coping with stress using problem-focused strategies that address the problem, such as managing time and seeking academic support, were correlated with increased life satisfaction ($r=.29$), low psychopathology ($r=-.31$), and decreased burnout ($r=-.17$). Limiting coping strategies categorized as avoidance and alone were associated with undesirable outcomes respectively (life satisfaction $r=-.22, -.33$; psychopathology $r=.39,.31$; school burnout $r=.43,.27$).
**Eustress.** The ACE program distinguishes between the negative stress response, distress, and the positive stress response, eustress. An individual experiencing eustress is engaged, motivated, and appropriately challenged (Nelson & Simmons, 2011). Distress and eustress are distinct constructs measured by two different self-report measures (Perceived Stress Scale [Cohen et al., 1983]; Eustress Scale [O'Sullivan, 2011]). Strategies employed by the ACE program, including effective coping and engagement, help students achieve eustress, which consistently relates to positive psychological and educational outcomes (O’Sullivan, 2011; Suldo et al., 2018).

In sum, the ACE program aims to increase student engagement, use of effective coping skills, and facilitate eustress, and decrease ineffective coping for students taking part in rigorous high school curricula. With these skills in hand, students should ultimately demonstrate desirable mental health and academic outcomes.

**Mental Health Outcomes**

It is necessary to look at both positive and negative indicators of emotional states to capture complete mental health (Hoover et al., 2019; Suldo & Doll, 2021).

**Psychopathology and Subjective Well-Being.** Suldo and Shaffer (2008) detailed a dual-factor model of mental health, which examined indicators of *wellness* and *mental health problems* to determine total mental health. In their study, 349 middle school students provided self-report data on life satisfaction (a positive mental health indicator) and psychopathology (a negative mental health indicator). Analysis revealed that over half of the sample (52%) experienced complete mental health (high life satisfaction, low psychopathology), while 17% of the sample fell into the troubled category (low life satisfaction, high psychopathology; Suldo & Shaffer, 2008). However, two additional types of students emerged that demonstrate that
subjective well-being and psychopathology do not exist on a single continuum. About 13% of students were labeled symptomatic but content (high life satisfaction, high psychopathology), and another group of 13% of students were labeled vulnerable (low life satisfaction, low psychopathology; Suldo & Shaffer, 2008). Holding psychopathology constant, students with high life satisfaction (complete mental health vs. vulnerable) demonstrated optimal academic and social outcomes compared to their vulnerable peers (Suldo & Shaffer, 2008), suggesting the salience of subjective well-being to student functioning.

**Burnout.** Academic burnout is another negative psychological state pertinent to AP/IB students who experience high levels of academic stress (Suldo & Shaunessy-Dedrick, 2013b). Burnout mirrors emotional distress in the educational setting. Suldo et al. (2018) concluded that lower levels of burnout were associated with a range of positive outcomes in the realms of motivation, engagement, support, and coping.

Taken together, there is increased understanding that a nuanced view of mental health that assesses both positive and negative indicators is an important framework for researchers to use (Suldo & Doll, 2021). Applying this research on a dual-factor model of mental health to evaluate well-being in AP/IB students indicates the need to measure mental health functioning through indicators of subjective well-being (e.g., positive affect, life satisfaction), psychopathology, and academic burnout.

**Academic Outcomes**

A significant benefit for students who take accelerated classes is universities’ positive perception of these classes and waived college credits. Both these benefits are only recognized when students maintain positive academic outcomes. For students in AP/pre-IBDP classes,
course grades indicate academic success. For AP students especially, qualifying scores on AP end-of-course exams also indicate positive academic performance.

**Course Grades.** A student’s end-of-course semester grades—reflected in their grade point average (GPA)—is a popular indicator of academic achievement since it provides a universal scale to compare performance with other students. Many high schools require students in accelerated classes to maintain a passing GPA to stay enrolled in the program. In one sense, GPA is an academic gatekeeper for access to a rigorous curriculum. To continue pursuing accelerated classes, students must adequately demonstrate and apply gained knowledge.

**Exam Scores.** The end-of-year AP exam score is an especially relevant academic outcome for AP students. To be considered for waived college credit for an AP class taken, College Board recommends accepting AP exam scores of 3 or above on the course-specific AP exam (College Board, 2022). Students who maintain a passing grade in an AP class but receive less than a three on the AP exam will likely not receive college credit for that class. For IB, a comprehensive examination given at the end of the year is a large part of passing the course (IBO, 2022), which counts towards the IB diploma. Both end-of-course exam experiences represent a capstone experience. Measuring both GPA and AP exam performance represent salient comprehensive academic outcomes.

**Retention and Persistence in Accelerated Curricula.** With the societal shift in accelerated courses becoming accessible to younger students, retention in these courses throughout high school (and what factors play into continued AP/IB participation) is a new metric that should be examined. Since participation is voluntary, ongoing engagement in accelerated classes is another crucial component of success.
The models for student retention have mainly been applied to higher education institutions, such as colleges and universities. Initially, there are differences between high school students and college-level students, including their living situation, class schedule, increased freedom, to name a few. However, the 9th-grade transition, like the transition to college, is the entrance into a different school setting, presumably with more responsibility and challenging, independent course work. Research related to retention in a university setting may hold principles salient for the retention of students in accelerated high school classes. Retention in a rigorous high school curriculum may also be foundational for achieving a college degree. If students can develop skills/processes for coping with academic challenges in the high school setting, they will have success experiences to draw on for future academic hurdles.

Retention, defined by Tinto (1975), is a combination of the student’s academic potential and the educational setting in which the student assimilates. Research by Kerby (2015) indicated different factors (described by various models) that predict whether a student will persist in their endeavor to obtain a college degree and builds upon earlier work by Tinto (1975), Spady (1970), and Bean (1985). The updated retention model proposed by Kerby (2015) is multi-faceted and includes many factors in the following domains: external factors, pre-college factors, internal factors, and adaptative factors. External factors, such as national climate, and internal factors, including specific university culture/climate, are variables that operate at the institutional level and are above the individual student level. Pre-college factors included academic factors (high school academic performance), environmental factors (family background), sociocultural factors (race, class, gender), and goals (education/career). Adaptation included grade performance, intellectual development, social integration, and institutional commitment. While a significant relationship exists between fixed factors, including institutional factors, and previous academic
performance (GPA) and student retention, other malleable student-level factors such as social and academic integration and educational and career goals, also contribute to continuation in higher education programs. Universities and high schools that offer college-level curricula must focus on protective factors— in line with pre-college factors and adaptation— to promote resilient environments for continued academic growth (Kerby, 2015).

Educators have focused on isolating retention from first to second-year college students (Kerby, 2015), showing that students are more likely to continue their education once the initial assimilation into the academic setting occurs. Haktanir and colleagues (2021) defined the college adjustment period as:

A multi-dimensional construct comprised of an individual’s ability to cope with the demands of academic work and the social environment of university life, as well as his or her sense of well-being and overall attachment to the academic institution. (p.2)

Several studies (Carter et al., 2013; Gray et al, 2013; Robbins et al., 2009) support the link between a positive adjustment experience and student enrollment through graduation.

This concept of a supported adjustment experience aligns with other prevention programs, namely the ACE program, focused on the benefits of early intervention at the point of entry into the curriculum. Many colleges employ freshmen programs to build a solid academic and social foundation that supports eventual graduation (Howard & Flora, 2015). These specific supports for first-year students include bridge programs, pre-term orientation, targeted seminars, learning communities, early warning/early alert systems, service learning, and undergraduate research (Howard & Flora, 2015; Kerby, 2015). A study of these various first-year programs at six liberal art colleges (Howard & Flora, 2015) noted that pre-term orientation, early warning/early alert systems, and service-learning programs were the most popular. These
programs possibly facilitate social/academic integration, create a community of support, and indicate students that may need targeted help before they drop out (Howard & Flora, 2015; Pan et al., 2008; Robinson et al., 1996).

Student level factors may also play into a favorable adjustment period. Haktanir and colleagues (2021) examined the association between resilience and academic self-concept concerning first-year student adjustment in 514 first-year students (302 female, 212 male) at a medium-sized university. Self-report surveys on factors of resilience (the ability to bounce back from difficult situations), academic self-concept (academic aspect of self-concept), and college adjustment (belief in self and supportive network) were collected eight times throughout the fall semester. Correlational analyzes found statistically significant positive correlations between resilience and college adjustment ($r=.20$, $p<.05$) and academic self-concept and college adjustment ($r=.60$, $p<.05$). A multiple regression analysis found that resilience and academic self-concept significantly predicted college adjustment ($F[2, 506]=131.53$, $p<.05$, $R^2=.36$) and accounted for 36% of the variability in student adjustment to college scores. More specifically, resilience accounted for approximately 32% of the variance in total adjustment, and academic self-concept accounted for around 4% of the variance.

Parker and colleagues (2006) examined the relationship between emotional intelligence and academic retention in full-time first-year university students. Emotional intelligence comprised the following categories: intrapersonal abilities, interpersonal abilities, adaptability, and stress management abilities (as measured by the Emotional Quotient Inventory [EQ-i], Bar-On, 2004). A total of 1,270 students (368 men, 902 women) completed the questionnaire in the first two weeks of their first year of college and permitted use of their academic progress (first-year GPA). Students who persisted through their first year of college, had significantly higher
levels of total emotional intelligence ($n^2 = 0.050$), interpersonal ($n^2 = 0.021$), intrapersonal ($n^2 = 0.015$), adaptability ($n^2 = 0.024$), and stress management ($n^2 = 0.042$) than those who dropped out. This link between retention after year one of college and emotional intelligence is supported by other studies (Parker et al., 2005; Parker et al., 2004).

Students entering the IB program, or engaging in one or multiple AP classes, may experience a similar adjustment period. Factors related to successfully navigating college change are worth examining with AP/pre-IBDP students as they may translate into increased retention in accelerated classes. Mirroring these results to first-year AP/pre-IBDP students, skills taught by the ACE program, including coping strategies (stress management), engagement, seeking support (interpersonal/intrapersonal), and problem-solving (adaptability), are likely necessary emotional components for remaining enrolled in future rigorous curriculum in high school.

**Evaluations of the ACE Program**

In year 3 of the IES-funded grant (2017-2018 school year), Suldo et al. (2022) conducted a randomized control trial (RCT) to determine the extent to which the ACE program affects the proximal program targets and distal academic and mental health outcomes described above. A total of 548 9th grade students (in 15 AP/IB programs from within 14 schools) took part in this small-scale cluster randomized control pilot study. Each participating school was matched with a demographically similar school to create a pair. Of the pair, one school was randomly assigned to the treatment condition (the ACE intervention) and the other school to the business-as-usual (BAU) condition. Student participants completed self-report surveys measuring engagement, coping, and mental health before and after the intervention, and school district staff provided academic data. Students in the 8 treatment conditions received all five components of the ACE program, while students in the 7 BAU condition received existing school-based support. Post
surveys were collected from 513 students (6% attrition rate from the initial sample). Since the level of analysis was at the school level, statistical adjustments were made for the nested sample.

Analysis from Suldo et al. (2022) revealed standardized effect estimates in the desired direction for most proximal outcomes, including engagement, coping, and eustress, and the distal outcome of mental health. As a multi-dimensional construct engagement comprised two affective variables, two behavioral variables, one cognitive variable, and two achievement motivation variables. Six variables yielded small positive effect estimates: affective ($d=0.26, 0.23$), behavioral ($d=0.19$), cognitive ($d=0.17$), and achievement motivation ($d=0.27, 0.14$). The coping variables revealed the desired directionality with the effective approach/problem-focused coping ($d=0.16$) and the ineffective avoidance ($d=-0.15$) and alone ($d=-0.15$). Eustress had a medium positive effect estimate ($d=0.23$). Regarding mental health, the positive indicator of subjective well-being had a positive effect ($d=0.07$), while the undesirable outcomes including internalizing problems ($d=-0.07$), externalizing problems ($d=-0.08$), and academic burnout ($d=-0.29$) had a negative directionality. At post-intervention, outcomes with effects in the direction that was opposite of hypothesizes included behavioral engagement (extracurricular activities, $d=-0.04$), and academic outcomes including 9th grade GPA ($d=-0.07$) and AP Human Geography exam scores ($d=-0.38$).

Ferron et al. (2021) also supported these promising ACE intervention results using a masked visual analysis technique, commonly used in single-case design. With a nested sample (students within schools), the masked visual analysis technique provides a holistic data summary option to reduce type I error. The masked visual analysis uses a graphical data display that allows researchers to analyze the patterns within data. Graphs do not show if/when treatment began, so intervention effects must be deduced visually. The grouped schools (one treatment, one
BAU) made up one packet for the ACE intervention data. Each school had its data displayed in box plot form on the 19 different proximal and distal outcomes. The research team reviewed each group and had to identify which graph represented the treatment school and which graph represented the BAU school. Various combinations of the 19 outcomes were used to decide on intervention conditions. Graph reviewers identified the treatment schools and control schools correctly on the first try, resulting in a type I error of less than .05. This shows the overall effectiveness of the intervention considering the outcome variables holistically.

Taken together, the ACE intervention was associated with small positive effects on indicators or student engagement, coping, eustress, and mental health. Compared with the current support offered to this population (represented by the BAU group), the ACE program represents an essential social-emotional addition for these students. However, it is unknown how the supports learned in the ACE program affect students over time. While post-intervention assessments identify proximal outcomes, distal outcomes, such as academic achievement, need longitudinal assessments to capture their development. Follow-up assessments for SEL programs are infrequent but those studies who do longitudinal assessments note larger effects compared to immediate treatment effects (van Loon et al., 2020).

Delayed Effects of SEL Interventions

While SEL interventions may provide immediate treatment effects (typically measured at a post-intervention shortly after the completion of the intervention), there may be lasting or increased benefits that persist as students continue to use skills they have gained. Universal interventions may produce three different types of effects: treatment effects, prevention effects, and promotion effects (Greenberg & Abenavoli, 2017). Treatment effects represent the causal effect of the intervention. Prevention effects represent the negative consequences the intervention
is designed to shield against, for example a drug intervention preventing methamphetamine use (Greenberg & Abenavoli, 2017), while promotion effects represent the desirable outcomes of the intervention, such as an SEL intervention improving social skills (Greenberg & Abenavoli, 2017). Greenberg and Abenavoli (2017) noted that treatment effects and promotion effects may emerge at post-intervention (after immediate completion of the intervention), but prevention effects may appear only after a delay in treatment. However, few studies track intervention effects over time. A meta-analysis by van Loon et al. (2020) that reviewed 54 school-based adolescent stress reduction programs noted that only 30% (17 studies) of the programs included a follow-up measurement; however, it was not reported what percentage of the original sample participated in the follow-up assessment. These follow-up assessments ranged from 4 to 48 weeks, with the average follow-up assessment conducted at 17 weeks. Even with this time range in follow-up assessments, effects became more extensive at the follow-up assessments ($d=0.672$) than at the post-intervention assessments ($d=0.522$; van Loon et al., 2020).

Some longitudinal intervention studies comprise elementary-age students, likely because elementary schools have fewer barriers to follow-up assessment such as high school graduation or dropout. Students in secondary education typically have several obstacles to continuous evaluation. These include multiple teachers (which makes it challenging to identify a point of contact to evaluate a student over time) and more diverse curricular options (students may not be on the traditional school campus for part of the day and attend classes at an alternative location).

Kam et al. (2004) examined the long-term effects of the PATHS (Promoting Alternative Thinking Strategies) universal SEL curriculum on elementary-aged children over three years. The sample comprised 133 students with disabilities assessed pre-intervention, one-month post-intervention, and then every year for three subsequent years. The researchers employed a
randomized intervention design and assigned special education classrooms to either the intervention or control condition. The intervention condition implemented the PATHS curriculum, which consisted of 60 lessons divided into the self-control, feelings, and problem-solving units that the classroom teacher delivered. Researchers examined the trajectory of intervention effects over the three-year assessment period. The teacher-rated factors such as externalizing and internalizing behaviors, the self-reported depression assessment, and the affective vocabulary rating indicated significant differences between the intervention and control groups (Kam et al., 2004). For externalizing behaviors, the teacher rating of the intervention group decreased by 0.37 points per year, while the teacher rating of the control group increased by 0.72 points per year. Regarding internalizing behaviors, the teacher ratings for both groups over the three years increased. However, the increase was much lower in the treatment condition (0.38 points per year) than in the control condition (1.83 points per year). For depression, students in the intervention condition had a decrease of 3.7 points in their depression score, compared to a decrease of 0.85 points in the control condition. Lastly, students in the intervention condition displayed a significant increase in their negative feelings vocabulary (0.45 rate of increase) compared to the control group (0.23 rate of increase; Kam et al., 2004). Certain outcomes such as social competence, positive feelings vocabulary, and social problem-solving skills showed no significant intervention group differences over time (Kam et al., 2004).

Vassilopoulos et al. (2018) examined the effectiveness of a seven-session SEL program on school adjustment from kindergarten to elementary school. Based on scheduling availability, researchers assigned the participating first-grade classes to either the experimental group (n= 55 students) or the control group (n= 58 students). A total of 114 first-grade Greek students participated in all study requirements, including the seven intervention sessions, the pre-
assessment (one week before program implementation), post-intervention (one week after program completion), and follow-up assessment (three months after post-intervention). Teacher-reported prosocial behavior significantly increased within the treatment group at each assessment (pre-to-post assessment and post-to-follow-up assessment; Vassilopoulos et al., 2018). The mean scores for prosocial behavior between the experimental and control groups only differed significantly at the follow-up assessment. The researchers found no significant differences in this variable at pre-or post-intervention (Vassilopoulos et al., 2018). Time allowed this significant intervention effect to be detected. For teacher-reported social skills, both the intervention and control groups saw significant increases from pre-to post-intervention; however, only the intervention group significantly increased these skills from post to follow-up assessment (Vassilopoulos et al., 2018). Teacher-rated aggressive and disruptive behavior displayed an intervention effect that disappeared with time. The treatment group displayed a significant reduction in aggressive and disruptive behavior from pre-to-post assessment, but no significant changes persisted from post-to follow-up assessment. The control group had no significant changes in this factor at post or follow-up assessment (Vassilopoulos et al., 2018).

Top et al. (2016) studied the longitudinal effects of the Second Step SEL/character development curriculum in a middle school population. Top et al. (2016) identified 19 schools that had implemented Second Step for four consecutive semesters and compared their students to those in 16 schools that did not implement Second Step on a range of outcomes. The sample comprised 5,189 students from 5th through 8th grade who reported problem school behaviors, prosocial school behaviors, and academic achievement outcomes every semester for two years (four semesters). Since schools were not randomly selected into the intervention and control groups, the researchers controlled for gender, ethnicity, and SES within their analysis. Before
intervention, students in the treatment schools had higher levels of problem behaviors compared to the control schools, but no significant differences existed for prosocial school behaviors and academic achievement. Over the four-semester assessment period, there was a significant difference in the growth rate of problem school behaviors and academic achievement between the intervention and control schools. Problem school behaviors had a lower growth rate in the intervention schools than in control schools. Academic achievement had a higher growth rate in the intervention schools than in control schools. No significant differences existed in the growth rate of prosocial school behaviors between the intervention and control schools. Top et al. (2016) determined that the Second Step curriculum explained 30% of the variance in the growth rate of school problem behaviors and 15% of the variance in academic achievement. Overall, students who participated in the Second Step curriculum had higher academic achievement and exhibited fewer problem behaviors than students in the control schools across four school semesters.

A meta-analysis by Sklad et al. (2012) provided a different perspective on the follow-up effects of social, emotional, or behavioral (SEB) programs. These researchers categorized study effects from 75 various intervention programs into seven outcome categories: social-emotional skills, positive self-image, antisocial behavior, prosocial behavior, substance abuse, mental health disorders, and academic achievement. Post-test assessments occurred within six months of intervention completion, while follow-up assessments occurred at least seven months after study completion. While 73% of the programs had post-test assessments, only 36% of the programs had a follow-up assessment between 7-18 months, and 21.3% had follow-assessments greater than 19 months. Table 3 details the effect sizes for all seven outcomes at post-intervention and follow-up assessment and the number of studies included at the different time points.
Table 3:

Effect Sizes of SEB Interventions at Post-and-Follow-up (FU) Assessment, as reported by Sklad et al. (2012)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Number of studies at Post</th>
<th>Post-Assessment Effect Size (d)</th>
<th>Number of studies at FU</th>
<th>FU Effect Size (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Achievement</td>
<td>10</td>
<td>0.46</td>
<td>7</td>
<td>0.26</td>
</tr>
<tr>
<td>Antisocial Behavior</td>
<td>39</td>
<td>-0.43</td>
<td>16</td>
<td>-0.20</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td>13</td>
<td>-0.19</td>
<td>11</td>
<td>-0.10</td>
</tr>
<tr>
<td>Positive Self-Image</td>
<td>8</td>
<td>0.46</td>
<td>12</td>
<td>0.07</td>
</tr>
<tr>
<td>Prosocial Behavior</td>
<td>6</td>
<td>0.39</td>
<td>7</td>
<td>0.12</td>
</tr>
<tr>
<td>Social-Emotional Skills</td>
<td>31</td>
<td>0.70</td>
<td>15</td>
<td>0.07</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>10</td>
<td>0.02</td>
<td>24</td>
<td>-0.18</td>
</tr>
</tbody>
</table>

Note. * p < .001 for all effect sizes

The effect sizes for social-emotional skills, positive self-image, and prosocial behavior were moderate/large at post-assessment. However, a reduction in effect size for these same outcomes was seen at follow-up assessment. However, there are several limitations to consider. First, little information was provided regarding the purpose, intervention, and intended outcomes of the 75 individual studies. Without understanding the interventions that comprised this meta-analysis, it is difficult to make inferences about the change in effect size from post to follow-up assessment in such broad outcome categories. Second, there was a significant reduction in studies that administered a follow-up assessment. Studies that did not issue a follow-up assessment may have specific characteristics that caution generalization of these results. For example, a study that had significant gains in social-emotional skills at post-assessment (indicating a successful intervention) may have used their resources to deliver the intervention to a new group of students instead of administering a follow-up assessment. While the meta-analysis by Sklad et al. (2012) paints a broad picture of SEB intervention effects, a clarified view
of longitudinal intervention data in specific populations is needed to understand the nuances that underscore long-term intervention gains.

**Summary and Purpose of the Study**

From a public health model, interventions accessible to many (for example, delivered within the educational setting) and providing long-lasting effects may be considered resource-efficient and wise investments of resources. SEL interventions tend to display delayed effects because instead of teaching a skill in isolation, such as solving multistep word problems, these interventions teach context-specific processes and strategies (Greenberg & Abenavoli, 2017; van Loon et al., 2020). More research is needed to examine the longitudinal effects of SEL interventions on various populations and compare findings to conclusions from research on the broader umbrella of social, emotional, or behavioral (SEB) programs (i.e., Sklad et al, 2012). It may be the case the universal interventions that target SEL skills tend to exert stronger effects at a later point than interventions that target behavior problems such as externalizing forms of psychopathology.

The ACE program is especially poised for longitudinal evaluation since the academic and social demands that students face as they progress throughout high school may change how students apply their social-emotional skills. An important outcome that cannot be fully measured at post-intervention is persistence in advanced-level courses. Persisting in these classes throughout high school provides considerable benefits for these students. Students in academically rigorous programs are also likely to pursue post-secondary education opportunities. Higher education institutions present similar environments where coping strategies, engagement in their chosen school/program, and problem-solving are needed to maintain positive academic and emotional outcomes (Sedlacek, 2011). While the ACE intervention exhibits promising
results at post-intervention (Ferron et al., 2021; Suldo et al., 2022), it is unknown how these students are faring one year later. Data collection efforts that are halted prematurely may miss the total effectiveness of the intervention. It is necessary to analyze intervention effectiveness at one-year post intervention to assess how students perform in relation to the intervention targets.

The purpose of the current study is to analyze data from a one-year follow-up assessment of participants in the pilot ACE program, data collected during Year 4 of the aforementioned IES development grant (see Table 1). This study analyzed student outcomes related to both proximal intervention targets (coping, engagement, and eustress), as well as distal outcomes (mental health, academic outcomes, and AP/IB retention) and need for Tier 2 supports (i.e., eligibility for MAP meetings).
CHAPTER THREE: METHODS

This study involved secondary data analysis of an archival data set. This dataset arose from an Institute of Education Sciences (IES) Goal 2 Development and Innovation grant (R305A150543 Facilitating Academic Success and Emotional Well-Being among High School Students in Accelerated Curricula) awarded to the University of South Florida, via principal investigators Drs. Shannon Suldo and Elizabeth Shaunessy-Dedrick (2014). Permission was granted to the author of this dissertation from the principal investigators to access this data for secondary analysis. This study examined various intervention targets and outcomes of the ACE program at one-year post-intervention.

Pilot Study to Evaluate ACE Program Effectiveness (Grant Year 3)

In line with the proposed grant trajectory described in Table 1, a research team conducted the ACE program's pilot implementation during the 2017-2018 school year in three different school districts (referred to Districts A-C throughout) within a single southeastern state. The research team consisted of university professors, a post-doctoral research coordinator, and school psychology graduate students. The research team was responsible for obtaining consent from participants, collecting student survey data, and delivering the intervention to the treatment schools.

The year 3 study sample consisted of 547 students in 9th grade from 15 school programs (10 AP sites, 5 IB sites) within 14 public schools. The 14 schools that participated were selected based on district approval of the research study and school willingness by administration and teachers to participate. Researchers informed each school of the participation expectations in
grant year 3 and the intent to pursue one-year follow-up assessments starting in grant year 4. Researchers also reviewed the consent form with all study participants and received written informed consent from the parents and students.

Before randomization, the researchers explained the consent form document to all students. All students in participating school programs were completed a pre-assessment survey (baseline). Research team members visited each school to explain the purpose of the study and to administer and collect the self-report surveys. The survey packet consisted of self-report measures on factors such as engagement, coping, eustress, burnout, and mental health symptoms.

After all participants completed the pre-assessment, researchers informed each school of their randomization status—treatment or control (business as usual). To determine randomization status, researchers created six groups by pairing two schools together based on the school district and program type (AP or IB). Since 15 school programs participated in the study, one randomization group consisted of three programs. One school was randomly assigned to the treatment condition (implementation of the ACE program) within each group, while the partner school was randomly assigned the business-as-usual condition (BAU). Researchers randomly assigned two programs to the intervention group for the three-program group and one school to the control group (Ferron et al., 2021).

School programs randomly assigned to the treatment group had interventionists from the research team who collected baseline surveys, worked weekly with students throughout the 2017-2018 school year, and collected post-intervention surveys. Researchers implemented all four universal components of the ACE program at each treatment school. Teachers participated in their specific training and helped researchers deliver the 12 ACE student modules to all participants. Researchers held two sessions for parents of student participants and sent home
weekly module summaries via email. The mid-year screening identified 135 students with at least one academic or social-emotional risk factor, and 121 students (85.8%) participated in the selective MAP intervention (Suldo et al., 2022). From fall 2017 to spring 2018, the only interaction between the researchers and schools in the control group was the two survey assessments (pre-assessment in fall 2017 and post-intervention assessment in spring 2018). For the post-intervention assessment in spring 2018, researchers returned to all schools to administer and gather the post-intervention survey packet. Students completed the same assessments administered in the fall to gather data on engagement, coping, eustress, burnout, and mental health symptoms. Academic data, such as GPA and AP/IB exam scores, were obtained from the schools in the summer of 2018.

**Recruitment for the Study**

As indicated in Table 1, the multi-year grant proposal of the ACE program included collecting follow-up assessments starting in grant year 4. Researchers submitted the year 4 follow-up study for approval to university and local institutional review boards. The year 4 study was conceptualized as an extension of grant year 3 and received all necessary approvals (Institutional Review Board #22787 Appendix A- IRB approval letter).

To initiate recruitment for the follow-up study, the researchers contacted all 14 schools that participated in grant year 3 to discuss steps for implementing the one-year follow-up assessment. The 14 participating schools in the year 3 study spanned three different districts-District A, District B, and District C. All 14 schools allowed researchers access to students who participated in the grant year 3 study.
Visits from the research team to each school occurred during the fall and spring of the 2018-2019 school year. The purpose of these visits included recruitment and, subsequently, survey administration.

For recruitment, the research team met with previous student participants to obtain parental consent and student assent to participate in the follow-up survey assessment in late spring 2019. All student participants in the year 3 study, regardless of their current enrollment status in an AP class or the IB program, were recruited for participation.

When discussing the year 4 study with students in fall 2018, all researcher team members abided by the recruitment script approved by the Institutional Review Board (Appendix B). The script detailed the reasons for identification for study participation, the participation requirements, including that everything was voluntary, and instructions for returning the signed parent permission form. Even though the year 4 study was an extension of the year 3 study, participants needed a separate parental consent form and a student assent form to participate in the year 4 study during the 2018-2019 school year.

Districts A and B approved consent forms that included permission for a one, two, and three-year follow-up assessment. District C only allowed the consent form to cover the one-year follow-up assessment and indicated that any additional follow-up assessments would require a new consent form. Various people, such as the IB coordinator or classroom teacher, collected the signed parental consent forms at different schools. Researchers visited the school frequently to collect signed consent forms and distribute extra copies if needed.

Researchers also recruited students in the year 3 study who changed schools but remained within the district. Any year 3 participants who transferred to other schools involved in the year 4 study received visits from researchers at their new school. Students enrolled in schools outside
of the districts in the study jurisdiction were not recruited for participation. At a few schools with low return rate of parent consent forms to school, direct invitation of families via parent consent forms via mail occurred. Schools provided researchers with the home addresses of year 3 participants who had yet to return consent forms to schools. A letter titled *Invitation to Participate in a Follow-Up Study* (IRB #22787, Appendix C) accompanied the consent forms along with a return pre-paid addressed envelope.

**Participants**

Participants were students who were enrolled in the ACE program pilot study (9th graders enrolled in AP class or IB program during the 2017-2018 school year at participating schools) in both the treatment and BAU conditions. Students who were enrolled in the pilot study resided in three different school districts - District A, District B, District C - in a southeastern state. Overall, the current sample consisted of 336 10th grade students who completed a survey during the 2018-2019 school year. This sample accounted for 61.4% of the sample that participated in the pilot study in grant year 3 (547 students total in the pilot study sample). Most participants were 15 years old and female (66.37%). Students enrolled in AP course consisted of 63% of the sample (n=213), while the pre-IBD students comprised 36% of the sample (n= 123). There were 198 student participants who were in intervention schools (58%) and 138 participants who were in a control school (41%).

While every effort was made to collect an unbiased sample, it should be noted that bias may exist in the schools and students that consented to participate in the follow-up study. It is possible that students who had a positive experience with the program, or schools that reduced barriers for obtaining consent, such as frequently reminding students to return their form and having an easily accessible return system, had a higher likelihood of becoming part of the study.
sample. These characteristics of the sample should be taken into consideration when interpreting outcome results.

**Issues of Diversity**

The year 4 study sample comprised a subset of participants from the year 3 study. Participant diversity was an essential consideration in school recruitment for grant year 3. Steps taken to expand diversity included recruiting schools from districts with different populations, including rural, suburban, urban, and approaching schools with diverse populations regarding race and SES for study participation. Demographic analysis of the year 3 sample identified participants as majority female (64%) and from AP programs (64%; 36% IB; Ferron et al., 2021). Regarding race and ethnicity, 47% identified as White, 21% Hispanic, 7% Black, 11% Asian, and 14% multiracial (Ferron et al., 2021). A total of 43% of participants were eligible for free or reduced-price school meals (Ferron et al., 2021).

It should be noted that there are some limitations to the diversity of the year 4 sample, such as geographical location, district/school characteristics, and student characteristics. Since the year 3 study required weekly in-person visits, only schools within reasonable driving distance (approximately one hour commute) were recruited. Second, the participating schools might share specific characteristics such as school personnel who prioritize mental health or teachers willing to accommodate the time requirements of lessons. Specific to the year 4 sample, students who did not return the consent form could have low organizational skills or other characteristics such as higher stress levels that prevent them from taking on voluntary tasks, that would make it less likely for them to participate in the one-year follow-up data collection. The generalization of outcome results should be interpreted with these factors in mind.
Data Collection

The university and local Institutional Review Boards (IRB) approved all procedures for data collection. The IRB approved the parental consent forms (Appendix D) and student assent forms (Appendix E). All research team members used standardized data collection instructions (Appendix F) when administering the survey packet. Only participants who had parental consent and student assent participated in data collection.

The follow-up assessment survey packet consisted of the same measures given at pre-assessment (fall 2017) and post-intervention assessment (spring 2018). Students filled out the follow-up survey in a private space, for example, a conference room or empty classroom. A non-academic time, such as lunch or an elective period, was most commonly used to administer the survey in a small-group or individual setting. Researchers created four different versions of the survey packet to mitigate any response effect from measure order. Each version consisted of the same measures arranged in a different order. A research team member read aloud directions for completing the survey packet and was available to answer any questions that arose when students were completing the packet. Measures that were included in the survey packet are listed in Table 4.

Students bubbled in their chosen response options for each item. This format of bubbling in answers resulted from the research team using a scanner system to input student responses. Students spent between 45-60 minutes completing the survey packet. When students completed the survey packet, the research assistant checked the packet for any missing items and offered the student the chance to fill in any missing items. Schools provided the research team with academic data, including course grades for the 2018-2019 school year and scores on all AP exams.
Table 4:

*Measures in Survey Packet*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demographic form including current participation in a pre-IB/IB program and AP classes</td>
<td></td>
</tr>
<tr>
<td>2. Perceived Stress Scale (PSS; Cohen, et al., 1983)</td>
<td></td>
</tr>
<tr>
<td>3. Coping with Academic Demands Scale (CADS; Suldo et al., 2015)</td>
<td></td>
</tr>
<tr>
<td>4. Positive and Negative Affect Schedule for Children (PANAS-C-10; Ebesutani et al., 2012)</td>
<td></td>
</tr>
<tr>
<td>5. Eustress Scale (ES; O’Sullivan, 2011)</td>
<td></td>
</tr>
<tr>
<td>6. Student Life Satisfaction Scale (SLSS; Huebner, 1991)</td>
<td></td>
</tr>
<tr>
<td>7. Identification with School Questionnaire (ISQ, Voelkl, 1996)</td>
<td></td>
</tr>
<tr>
<td>8. Parenting Style Inventory (PSI-II, Darling &amp; Toyokawa, 1997)</td>
<td></td>
</tr>
<tr>
<td>9. School Burn-Out Inventory (SBI; Salmela-Aro et al., 2009)</td>
<td></td>
</tr>
<tr>
<td>10. School Attitude Assessment Survey-Revised (SAAS-R; McCoach &amp; Siegle, 2003)</td>
<td></td>
</tr>
<tr>
<td>11. Engagement versus Disaffection Scale (EVD; Skinner et al., 2009)</td>
<td></td>
</tr>
<tr>
<td>12. Multidimensional Student Life Satisfaction Scale (MSLSS, Huebner, 1994)</td>
<td></td>
</tr>
<tr>
<td>13. Brief Problem Monitor (BPM, Achenbach et al., 2011)</td>
<td></td>
</tr>
<tr>
<td>14. Extracurricular Activity Involvement Scale (EAI; Suldo et al., 2018)</td>
<td></td>
</tr>
</tbody>
</table>

Previous research by Suldo and colleagues (2015; 2018; 2019; 2022) established and validated composites that represented intervention targets and outcomes in the AP/IB population. For data continuity, the current study used these previously established constructs. The factors that comprise the constructs of interest to this study are described in the next section.
Measures: Intervention Targets

Coping

Different coping strategies were assessed using the Coping with Academic Demands Scale (CADS; Suldo, et al., 2015). The CADS measures coping strategies aligned with students pursuing advanced curriculum, in particular AP/IB classes. Participants respond to each item on a five-point scale, indicating if they engaged in this coping behavior from “1=Never” to “5=Almost Always,” during the current school year. Items on the CADS represent different coping behaviors. Each item is grouped into a scale on the CADS that represents a coping factor. Each coping factor is identified under a larger category, referred to as a coping style. Researchers identified six coping factors as an approach/problem-focused style, five factors as an Avoidance style, and one factor as an Alone style. Suldo and colleagues (2015; 2018) established strong internal consistency reliability for each style within the AP/IB population. Table 5 describes each coping style (far left column) and the different coping factors (indicated by a given scale) subsumed under each style.

Student Engagement

Student engagement is a multidimensional construct comprised of affective, behavioral, and cognitive engagement as well as achievement motivation. Subscales of the Engagement versus Disaffection Scale (EVD; Skinner et al., 2009), Identification with School Questionnaire (ISQ; Voelkl, 1996) and the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003) represented the three aspects of engagement. Table 6 details the engagement aspect and the subscale items that assessed that construct. Further details about each measure subscale are given in text after Table 6.
Table 5:

Coping Behaviors from the CADS

<table>
<thead>
<tr>
<th>Intervention Target: Coping Style</th>
<th>Coping Factor Scales</th>
<th>Individual Items</th>
</tr>
</thead>
</table>
| Approach/Problem-Focused         | Time and Task Management | • CADS19- Focus on the work until it is complete.  
|                                  |                      | • CADS26- Break work into manageable pieces.  
|                                  |                      | • CADS29- Use a planner to keep track of activities and assignments due.  
|                                  |                      | • CADS51- Get and keep materials for school organized.  
|                                  |                      | • CADS56- Be purposeful about how you schedule and spend all of your time.  
|                                  |                      | • CADS59- Prioritize the order in which you complete your work.  
| Cognitive Reappraisal            |                      | • CADS27- Think about the bigger picture (your goals or values) to put things in perspective.  
|                                  |                      | • CADS28- Tell yourself that you can do it, for example that you’ve managed similar situations before.  
|                                  |                      | • CADS49- Adopt an optimistic or positive attitude.  
|                                  |                      | • CADS54- Remind yourself of future benefits or rewards of finishing your school program, such as getting into college or getting scholarships.  
| Seek Academic Support            |                      | • CADS20- Ask teacher(s) questions about assignments or coursework.  
|                                  |                      | • CADS35- Study with other students.  
|                                  |                      | • CADS36- Get extra help for class from tutors.  
| Turn to Family                   |                      | • CADS5- Talk to parent(s) about what’s bothering you.  
|                                  |                      | • CADS17- Vent or complain to parent(s).  
|                                  |                      | • CADS32- Spend time with family.  
| Spirituality                     |                      | • CADS6- Go to church or place of worship.  
|                                  |                      | • CADS21- Pray.  
|                                  |                      | • CADS39- Rely on your faith to help deal with the problem.  
| Relaxation                       |                      | • CADS7- Focus on calming yourself down.  
|                                  |                      | • CADS31- Take deep breaths.  
| Avoidance                        | Skip School          | • CADS14- Take a day off from school to get work done.  
|                                  |                      | • CADS37- Take a day off from school to sleep or relax (a “mental health day”).  
|                                  |                      | • CADS48- Skip school to avoid tests you are not ready for or assignments you have not finished.  
|                                  | Substance Use        | • CADS45- Drink alcoholic beverages, such as beer, wine, liquor, etc.  
|                                  |                      | • CADS47- Use drugs, such as marijuana, medications not prescribed to you, etc.  
|                                  | Reduce Effort        | • CADS58- Smoke cigarettes or use other tobacco products.  
|                                  |                      | • CADS9- Turn in assignments late.  
|                                  |                      | • CADS24- Stop caring about schoolwork.  
|                                  |                      | • CADS42- Stop trying (give up).  
|                                  |                      | • CADS44- Work less on or just don’t do assignments that are less important.  |
Table 5: (Continued)

<table>
<thead>
<tr>
<th>Sleep</th>
<th>Take Short Cuts</th>
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</thead>
<tbody>
<tr>
<td>• CADS12- Take naps.</td>
<td>• CADS43- Sleep to escape or put off the problem.</td>
</tr>
<tr>
<td>• CADS43- Sleep to escape or put</td>
<td>• CADS47- Sleep to recharge so you can tackle a</td>
</tr>
<tr>
<td>off the problem.</td>
<td>problem.</td>
</tr>
<tr>
<td>• CADS57- Sleep to recharge so</td>
<td>• CADS4- Take less demanding classes.</td>
</tr>
<tr>
<td>you can tackle a problem.</td>
<td>• CADS13- Copy other students’ homework and</td>
</tr>
<tr>
<td></td>
<td>assignments.</td>
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<tr>
<td></td>
<td>• CADS55- Share (split-up) assignments with</td>
</tr>
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<td></td>
<td>classmates.</td>
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</table>

<table>
<thead>
<tr>
<th>Alone</th>
<th>Alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CADS15- Try to handle things</td>
<td>• CADS15- Try to handle things on your own.</td>
</tr>
<tr>
<td>on your own.</td>
<td>• CADS16- Try to ignore feelings of stress.</td>
</tr>
<tr>
<td>• CADS16- Try to ignore feelings</td>
<td>• CADS25- Keep problems to yourself.</td>
</tr>
<tr>
<td>of stress.</td>
<td>• CADS34- Become quiet (talk less or not at all to</td>
</tr>
<tr>
<td>• CADS25- Keep problems to</td>
<td>others).</td>
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<tr>
<td>yourself.</td>
<td></td>
</tr>
</tbody>
</table>

Note. **Response options from 1 to 5.

**Emotional Engagement (EE) and Behavioral Engagement (BE) subscale of the Engagement versus Disaffection Scale.** The Emotional Engagement (EE) subscale of the Engagement versus Disaffection (EVD; Skinner et al., 2009) is a 5-item self-report measure that is used to assess positive emotions at school. Items are rated on a 4-point Likert scale from 1 (strongly agree) to 4 (strongly disagree). Higher mean scores indicate higher emotional engagement. The Behavioral Engagement (BE) subscale of the EVD (Skinner et al., 2009) is a 5-item self-report measure that is used to assess on-task behavior, effort, and attention in the classroom. Higher scores indicate higher behavioral engagement in the academic setting.

Regarding convergent validity, scores on the ISQ are correlated moderately with teacher ratings of students’ emotional engagement (Skinner et al., 2009). Among a teenage sample, higher ISQ scores were significantly correlated with better grades (King & Gaerlan, 2014).

**Belonging Scale (BS) and Valuing Scale of the Identification with School Questionnaire.** The Belonging Scale of the Identification with School Questionnaire (BS of ISQ; Voelkl, 1997) is a 9-item self-report measure that is used to capture school belongingness through pride in one's school and feelings of respect and attachment to teachers. Items are rated on a 4-point Likert scale from 1 (strongly agree) to 4 (strongly disagree). High scores on the belongingness scale indicate high levels of school belongingness. The Valuing scale of the ISQ
(Voelkl, 1997) assesses personal views that school is important and relevant to one’s career and life goals. High scores on the Valuing scale indicate high levels of valuing school. Prior research by Voelkl (1997) identified a coefficient-alpha reliability of .84 in a sample of 1,335 8th grade students. Convergent and criterion validity was also established within this same sample.

**Extracurricular Activity Involvement Scale.** The Extracurricular Activity Involvement scale (EAI; Suldo et al., 2018) is a multi-item self-report measure that is used to collect the breadth and intensity of extracurricular activity involvement. Each type of extracurricular activity is rated on an incremental scale on the number of hours spent engaging in a specific activity, as well as overall weekly time commitment of all activities. The rating scale employs the following weekly time commitment categories: 0 (Not at all), <1 (Up to 1 hour), 1-3 hours, 4-6 hours, 7-9 hours, 10+ hours. Higher scores indicate larger time commitments to extracurricular activities. The measure was modeled after a 2-indicator approach capturing total frequency of ECA involvement and diversity (i.e., yes/no involvement in different types of activities; Bryan et al., 2012). The EAI composite score reflects (a) total number of types of ECAs in which student takes part, (b) overall estimate of time spent weekly in ECAs, and (c) estimate of time spent strictly in ECAs that are optional or voluntary (i.e., ECAs above and beyond requirements for school, program, or scholarships).

**Goal Valuation (GV), Self-Regulation (SR) Scale and Academic Self-Perceptions (ASP) Scales of the Student Attitude Assessment Survey-Revised.** The Goal Valuation (GV) scale on the Student Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003) is a 6-item self-report measure that assesses the importance student’s place on performing well in school. The Self-Regulation (SR) scale is a 10-item self-report measure that is used for measuring students' persistence to maintain goal-directed academic behavior through intentional
activities. The Academic Self-Perceptions (ASP) scale is a 7-item scale that measures perceived academic capabilities and skills. Items are rated on a 7-point Likert scale (1= strongly disagree to 7= strongly agree). High mean scores indicate high goal valuation, self-regulation, and academic self-perception in the academic setting. Convergent validity is supported through large correlations with students’ related beliefs about school and indicators of school behavior (Suldo et al., 2008).

Table 6:

**Student Engagement Measures**

<table>
<thead>
<tr>
<th>Intervention Target: Student Engagement</th>
<th>Measure</th>
<th>Individual Items</th>
</tr>
</thead>
</table>
| Affective Engagement                    | Emotional Engagement (EE) subscale of EVD<sup>a,b</sup> | • EVD6- When I’m in class, I feel good.  
• EVD7- When we work on something in class, I feel interested.  
• EVD8- Class is fun.  
• EVD9- I enjoy learning new things in class.  
• EVD10- When we work on something in class, I get involved. |
| Belonging Scale of ISQ<sup>b</sup>     |         | • ISQ1- I feel proud of being part of my school.  
• ISQ2- I am treated with as much respect as other students in my class.  
• ISQ4R<sup>d</sup>- The only time I get attention in school is when I cause trouble.  
• ISQ5- I like to participate in a lot of school activities (for example, sports, clubs, plays).  
• ISQ8R<sup>d</sup>- Most of my teachers don’t really care about me.  
• ISQ9R<sup>d</sup>- Most of the time I would like to be any place other than in school.  
• ISQ10- There are teachers or other adults in my school that I can talk to if I have a problem.  
• ISQ12- School is one of my favorite places to be.  
• ISQ13- People at school are interested in what I have to say. |

| Behavioral Engagement                  | Behavioral Engagement (BE) subscale of EVD<sup>a, b</sup> | • EVD1- I try hard to do well in school.  
• EVD2- In class, I work as hard as I can.  
• EVD3- When I’m in class, I participate in class discussions.  
• EVD4- I pay attention in class.  
• EVD5- When I’m in class, I listen very carefully. |
Table 6: (Continued)

<table>
<thead>
<tr>
<th>Cognitive Engagement</th>
<th>Goal Valuation scale of the SAAS-R&lt;sup&gt;g,h&lt;/sup&gt;</th>
<th>Self-Regulation scale of the SAAS-R&lt;sup&gt;g,h&lt;/sup&gt;</th>
<th>Achievement Motivation</th>
<th>Valuing subscale of ISQ&lt;sup&gt;c,b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAI&lt;sup&gt;e,f&lt;/sup&gt;</td>
<td>• ECA1- Sports and athletic teams.</td>
<td>• SAASR3- I check my assignments before I turn them in.</td>
<td>• ISQ3R&lt;sup&gt;d&lt;/sup&gt;- I can get a good job even if my grades are bad.</td>
<td></td>
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<tr>
<td></td>
<td>• ECA2- Performing arts and music.</td>
<td>• SAASR5- I work hard at school.</td>
<td>• ISQ6- School is one of the most important things in my life.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ECA3- Art and hobby clubs.</td>
<td>• SAASR6- I am self-motivated to do my schoolwork.</td>
<td>• ISQ7R&lt;sup&gt;d&lt;/sup&gt;- Many of the things we learn in class are useless.</td>
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<td></td>
<td>• ECA4- Academic team/clubs and honor societies.</td>
<td>• SAASR14- I complete my schoolwork regularly.</td>
<td>• ISQ11- Most of what I learn in school will be useful when I get a job.</td>
<td></td>
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<tr>
<td></td>
<td>• ECA5- Career-related clubs.</td>
<td>• SAASR16- I am organized about my schoolwork.</td>
<td>• ISQ14R&lt;sup&gt;d&lt;/sup&gt;- School is often a waste of time.</td>
<td></td>
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<tr>
<td></td>
<td>• ECA6- Community youth clubs.</td>
<td>• SAASR17- I use a variety of strategies to learn new material.</td>
<td>• ISQ15- Dropping out of school would be a huge mistake for me.</td>
<td></td>
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<td></td>
<td>• ECA7- Religious or spiritual activities at school or in community.</td>
<td>• SAASR20- I spend a lot of time on my schoolwork.</td>
<td>• ISQ16- School is more important than most people think.</td>
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<td></td>
<td>• ECA8- Publications.</td>
<td>• SAASR21- I am a responsible student.</td>
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### Table 6: (Continued)

<table>
<thead>
<tr>
<th>Academic Self-Perceptions (ASP) scale of the SAAS-R²</th>
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<tbody>
<tr>
<td>• SAASR1- I am intelligent.</td>
<td></td>
</tr>
<tr>
<td>• SAASR2- I can learn new ideas quickly in school.</td>
<td></td>
</tr>
<tr>
<td>• SAASR4- I am smart in school.</td>
<td></td>
</tr>
<tr>
<td>• SAASR7- I am good at learning new things in school.</td>
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<tr>
<td>• SAASR8- School is easy for me.</td>
<td></td>
</tr>
<tr>
<td>• SAASR11- I can grasp complex concepts in school.</td>
<td></td>
</tr>
<tr>
<td>• SAASR13- I am capable of getting straight A’s.</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** a=Engagement versus Disaffection scale (Skinner et al., 2009); b=Response options from 1 to 4; c=Identification with School Questionnaire (Voelkl, 1996); d=Item is reverse scored; e=Extracurricular Activity Involvement scale (Suldo et al., 2018); f=Participants rate their time commitment per week for various activities; g=School Attitude Assessment Survey-Revised (McCoach & Siegle, 2003); h=Response options from 1 to 7.

### Eustress

The **Eustress Scale** (ES; O’Sullivan, 2011) is a 5-item self-report measure that is used to measure the frequency that students respond positively to stress and consider stress motivating. Items are rated on a 6-point Likert scale from 1 (never) to 6 (always). The test items are as follows: 1) How often do you feel that stress positively contributes to your ability to handle your academic problems? 2) In general, how often do you feel motivated by your stress? 3) When faced with academic stress, how often do you find that the pressure makes you more productive? 4) How often do you feel that you perform better on an assignment when under academic pressure? 5) How often do you feel that stress for an exam has a positive effect on the results of your exam? The mean of the five-items represents the level of eustress. Higher scores indicate that a student experiences higher levels of eustress in the academic environment. From the original 10-item ES measure (O’ Sullivan, 2011), five of the most salient items for high school students were selected to represent the eustress construct in this study. Moseley (2018) examined the factor structure and found substantial factor loadings for each item (factor loadings between 0.59 and 0.89) and adequate reliability (alpha of .85) in a sample of 2,379 AP/IB students.
Measures: Intervention Outcomes

Mental Health Outcomes

Both positive and negative aspects of mental health were assessed. Positive aspects of mental health included the dimensions of subjective well-being that hold potential to index desirable levels of emotional health, including the presence of positive emotions and high levels of life satisfaction. Life satisfaction which was measured by the Student Life Satisfaction Scale (SLSS; Huebner, 1991), and positive affect measured by the Positive subscale of the Positive and Negative Affect Schedule for Children (PANAS-C-10; Ebesutani et al., 2012). The Brief Problem Monitor scale (BPM; Achenbach et al., 2011) represented internalizing and externalizing problems. Academic burnout was captured by the School Burnout Inventory (SBI; Salmela-Aro et al., 2009). Table 7 details the emotional outcomes and the subscale items that assessed that construct. Further details about each measure or subscale are given in text after Table 7.

Student Life Satisfaction Scale. The Student Life Satisfaction Scale (SLSS; Huebner, 1991) is a 7-item self-report measure that is used to capture global life satisfaction, an aspect of subjective well-being. Items are rated on a 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). Two out of the seven items are reverse scored. A high mean score represents high levels of life satisfaction, the cognitive dimension of subjective well-being. Previous research established convergent and discriminant validity (Gilman & Huebner, 1997). Suldo and colleagues (2018) established acceptable internal consistency (alpha of .87) within the AP/IB population.

Positive and Negative Affect Schedule for Children. The Positive and Negative Affect Schedule for Children, Child Version (PANAS-C-10; Ebesutani et al., 2012) examines the
frequency with which youth experience various positive affect and negative affect, to capture the affective dimension of subjective well-being. The scale is evenly divided with five positive emotions and five negative emotions. The response scale ranges from 1 (very slightly or not at all) to 5 (extremely). Cronbach’s alpha was acceptable for the Positive Affect scale (.86) and the Negative Affect scale (.82; Ebesutani et al., 2012). In the current study, the Negative Affect Scale was not analyzed due to the availability of data on psychopathology which encompasses the presence of negative emotionality. The Positive Affect scale significantly differentiated between several groups of youth, as evidenced by significant AVONAs and Area Under the Curve (AUC) values. Using the Positive Affect scale, researchers were able to discriminate between youth with no internalizing /externalizing from youth with mood disorders (AUC= .77), between youth with mood disorders from youth with an externalizing disorder (AUC= .77), and between youth with a mood disorder from youth with an anxiety disorder (AUC= .78; Ebesutani et al., 2012).

**Brief Problem Monitor.** The Brief Problem Monitor (BPM; Achenbach et al., 2011) scale, drawn from items on the 112-item Youth Self-Report (YSR) form of the Achenbach System of Empirically Based Assessment (ASEBA), was used to measure psychopathology. The Internalizing Problems scale used six items to reflect students’ levels of anxiety/depression. The Externalizing Problems scale consisted of seven items that assessed student reports of aggressive behavior and delinquent behavior. Response options are from 0 (not true) to 2 (very true or often true). The BPM technical manual reported acceptable internal consistency and test-retest for both the Internalizing Problems scale (α= .78, r= .85) and Externalizing Problems scale (α= .75, r= .80; Achenbach et al., 2011). Roth et al. (2017) found similar internal consistency results in a sample of 42 middle school students (Internalizing Problems post-intervention α= .82,
Internalizing Problems 5-week follow-up $\alpha = .88$, Externalizing Problems baseline $\alpha = .74$, Externalizing Problems post-intervention $\alpha = .82$). Achenbach et al. (2011) provides evidence of criterion-validity as scores on the Internalizing and Externalizing scales significantly differentiated between youth with psychopathology and youth without psychopathology.

**Table 7:**

**Mental Health Outcomes Measures**

<table>
<thead>
<tr>
<th>Intervention Target: Mental Health Outcomes</th>
<th>Measure</th>
<th>Individual Items</th>
</tr>
</thead>
</table>
| Life Satisfaction                          | SLSS$^{a,b}$ | • SLSS1- My life is going well.  
  • SLSS2- My life is just right.  
  • SLSS3R- I would like to change many things in my life.  
  • SLSS4R- I wish I had a different kind of life.  
  • SLSS5- I have a good life  
  • SLSS6- I have what I want in life.  
  • SLSS7- My life is better than most kids’ |
| Positive Affect                            | Positive Affect subscale of PANAS-C-10$^{d,e}$ | • PANAS_C2- Happy.  
  • PANAS_C5- Cheerful.  
  • PANAS_C6- Proud.  
  • PANAS_C8- Joyful.  
  • PANAS_C10- Lively |
| Internalizing Problems composite of BPM$^{f,g}$ | Internalizing Problems | • BPM9- [item not presented due to copyright restrictions]  
  • BPM11- [item not presented due to copyright restrictions]  
  • BPM12- [item not presented due to copyright restrictions]  
  • BPM13- [item not presented due to copyright restrictions]  
  • BPM18- [item not presented due to copyright restrictions]  
  • BPM19- [item not presented due to copyright restrictions] |
| Externalizing Problems composite of BPM     | Externalizing Problems | • BPM2- [item not presented due to copyright restrictions]  
  • BPM6- [item not presented due to copyright restrictions]  
  • BPM7- [item not presented due to copyright restrictions]  
  • BPM8- [item not presented due to copyright restrictions]  
  • BPM15- [item not presented due to copyright restrictions]  
  • BPM16- [item not presented due to copyright restrictions]  
  • BPM17- [item not presented due to copyright restrictions] |
<table>
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<tr>
<th>Academic Burnout</th>
<th>SBI&lt;sup&gt;h,b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SBI1 - I feel overwhelmed by my schoolwork</td>
<td></td>
</tr>
<tr>
<td>• SBI2 - I feel a lack of motivation in my schoolwork and often think of giving up.</td>
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<tr>
<td>• SBI3 - I often have feelings of inadequacy in my schoolwork.</td>
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<tr>
<td>• SBI4 - I often sleep badly because of matters related to my schoolwork.</td>
<td></td>
</tr>
<tr>
<td>• SBI5 - I feel that I am losing interest in my schoolwork.</td>
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<tr>
<td>• SBI6 - I’m continually wondering whether my schoolwork has any meaning.</td>
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<tr>
<td>• SBI7 - I brood over matters related to my schoolwork a lot during my free time</td>
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</tr>
<tr>
<td>• SBI8 - I used to have higher expectations of my schoolwork than I do now</td>
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<tr>
<td>• SBI9 - The pressure of my schoolwork causes me problems in my close relationships with others.</td>
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</table>

Note. <sup>a</sup> = Student Life Satisfaction Scale (Huebner, 1991); <sup>b</sup> = Responses from 1 to 6; <sup>c</sup> = Reverse scored; <sup>d</sup> = Positive and Negative Affect Schedule for Children (Ebesutani et al., 2012); <sup>e</sup> = Responses from 1 to 5; <sup>f</sup> = Brief Problem Monitor (Achenbach et al., 2011); <sup>g</sup> = Responses from 0-2; <sup>h</sup> = School Burnout Inventory (Salmela-Aro et al., 2009).

**School Burnout Inventory.** The School Burnout Inventory (SBI; Salmela-Aro et al., 2009) is a 9-item self-report measure that captures three different aspects of burnout in the academic setting. Items are rated on a 6-point Likert scale from 1 (completely disagree) to 6 (strongly agree). Responses from all nine items are combined to form a mean score. No items are reverse scored. Students who have high mean score report high levels of school burnout. The SBI measures three aspects of burnout including feelings of exhaustion at schoolwork, cynicism toward the meaning of school, and sense of inadequacy at school. Salmela-Aro et al. (2009) established concurrent and factorial validity. Suldo et al. (2018) reported an acceptable internal consistency of the SBI (alpha= .88) within a sample of 2,379 AP/IB students.

**Academic Outcomes**

**Participation in Accelerated Courses.** For current enrollment in AP classes or the IB program, students were asked to self-report these outcomes on the Demographics Survey. The Year 4 demographics survey had multiple questions about current enrollment in AP classes or the IB program. Students indicated if they were currently enrolled in a pre-IB or IB program with
a yes or no response. Another question asked if a student was currently taking any AP classes. If students had an affirmative response to that question, they were prompted to indicate how many AP courses they were currently taking and how many classes they completed. The full demographics survey is presented in Appendix G.

**Grade Point Average.** Unweighted Grade Point Average (GPA) for the 2018-2019 year was used as an indicator of academic outcomes. Schools provided the researcher with final student grades at the end of the 2018-2019 school year. Unweighted GPA is calculated using standard point system (A= 4 points, B= 3 points, C= 2 points, D= 1 point, F= 0 points). Additional weightings for other factors, e.g., honors or AP classes, were not considered so that all students GPA fell within a 0 to 4.0 range. Using this points system, researchers calculated the students GPA for 10th grade. A students 10th grade GPA reflected grades during semester 1 courses and then semester 2 courses, which were averaged together to create an overall 10th grade GPA variable. The GPA variable in this study is specific to grades from fall 2018 to spring 2019 (end of their sophomore year).

**Advanced Placement Test Scores.** School districts provided researchers with students’ AP test scores in the summer of 2019. The scores for AP exams ranged from one to five and a scores of a three or higher was considered a qualifying score. If students had more than one AP score, a mean score of all the AP end-of-course exams taken in spring 2019 was used.

**Need for Tier 2 Support**

Data sources, including emotional and academic indicators, identified as salient indicators in Suldo et al. (2019) determined if students met the threshold for emotional or academic risk at the end of 10th grade. Emotional indicators included the Perceived Stress Scale (PSS; Cohen et al., 1983) and School Satisfaction (SS) scale on the Multidimensional Student’s
Life Satisfaction Scale (MSLSS; Huebner, 1994). In Suldo et al. (2019), two academic variables, unweighted semester GPA or current semester grade in a designated AP or IB class, defined academic risk. In grant year 3, the 9th grade student participants were enrolled in the same AP or IB class due to their freshman status. In a student’s sophomore year, the selection of AP classes expands, and some students do not return to the pre-IBDP program. Since students in this sample were in 10th grade were taking a variety of AP or IB classes, only unweighted 10th grade GPA was used to assess academic risk. Table 8 describes the measures used to assess the need for Tier 2 support.

**Perceived Stress Scale.** The Perceived Stress Scale (PSS; Cohen et al., 1983) is a 6-item self-report measure that is used to assess general perceived distress in youth. Items are rated on a 5-point scale (0= never to 4= very often). High mean scores represent high levels of distress. Construct validity is supported by large correlations with students’ mental health (Suldo, et al., 2008).

**School Satisfaction (SS) Scale of the Multidimensional Student Life Satisfaction Scale.** The School Satisfaction (SS) scale of the Multidimensional Student Life Satisfaction Scale (MSLSS; Huebner, 1994) is an 8-item self-report measure that reflects youth satisfaction specific to the domain of school. Items are rated on a 6-point Likert scale (1= strongly disagree to 6= strongly agree). High mean scores indicate high levels of school satisfaction. Construct validity has been supported with large correlations between the MSLSS and other measures of well-being (Huebner et al., 1998).

**Unweighted GPA in 10th Grade** was used to assess academic risk in this population. The full year GPA was utilized because it mirrored the time frame represented by the other outcome variables in this study.
Table 8:

Need for Tier 2 Support Measures

<table>
<thead>
<tr>
<th>Intervention Target: Need for Tier 2 support</th>
<th>Measure</th>
<th>Individual Items</th>
</tr>
</thead>
</table>
| Distress                                    | Perceived Stress Scale (PSS)\(^{a,b}\) | - PSS1: How often have you been upset because of something that happened unexpectedly?  
- PSS2: How often have you felt that you were unable to control the important things in your life?  
- PSS3: How often have you felt nervous and “stressed”?  
- PSS4: How often have you found that you could not cope with all the things you had to do?  
- PSS5: How often have you been angered because of things that happened that were outside of your control?  
- PSS6: How often have you felt difficulties were piling up so high that you could not overcome them? |
| School Satisfaction                         | School Satisfaction (SS) scale of the MSLSS\(^{c,d}\) | - MSLSS1R: I feel bad at school.  
- MSLSS2: I learn a lot at school.  
- MSLSS3R: There are many things about school I don't like.  
- MSLSS4R: I wish I didn't have to go to school.  
- MSLSS5: I look forward to going to school.  
- MSLSS6: I like being in school.  
- MSLSS7: School is interesting.  
- MSLSS8: I enjoy school activities. |
| Grades                                      | Unweighted GPA for 10\(^{th}\) grade | - Mean value assigned to letter grades (e.g., A=4.0, B=3.0) to calculate unweighted GPA for 10\(^{th}\) grade. |

Note. \(^{a}\) Perceived Stress Scale (Cohen et al., 1983); \(^{b}\) Responses from 0 to 4; \(^{c}\) Multidimensional Student’s Life Satisfaction Scale (Huebner, 1994); \(^{d}\) Responses from 1 to 6; \(^{e}\) Reversed-scored

Ethical Considerations

All research activities conducted within the Year 4 study received a review by the USF Institutional Review Board (IRB), which examined any ethical concerns posed by this research activity. The IRB determined that the Year 4 study posed minimal risk to participants. The researchers informed all potential Year 4 study participants that participation was voluntary, could be revoked at any time, and that declining to participate would not affect their relationships with their high school or the researchers' institution. Students in Districts A and B received either a $10 music gift card or an $8 movie gift card after completing the survey. Students in District C did not receive any incentives for completing the survey. The district review board for District C did not allow students to directly receive incentives for completing the survey packet. All
students in the follow-up study had parental consent and written assent to participate. The researchers worked with students to find a time outside of core academic instruction to complete the survey packet to minimize educational intrusion. Research team members reviewed the completed survey pack and offered students a chance to fill in any missing items; however, students could skip any items they chose. Errors in data entry were minimized by using an optical scanner to transfer student’s bubbled-in responses from hard copy to digital storage. The accuracy of the data entry was manually verified by members of the research team. All survey data in the archival database contained de-identified data for analysis.

**Researcher Positionality Statement**

This researcher was a graduate student member of the ACE research team from 2015 to 2019 and participated in all four years of the ACE program development. This researcher participated in content creation, feedback sessions with stakeholders, intervention delivery, fidelity assessment, survey administration, data input, data checking, and participant recruitment. During grant year 3, this researcher was primarily responsible for conducting all research activities related to the ACE program at one IB school. All research team members assisted with intervention activities, for example conducting MAP meetings and administering surveys, at various schools in grant year 3. For grant year 4, this researcher recruited students for study participation, including the school where this researcher implemented the ACE program. This researcher was involved in inputting and checking data for the self-report surveys collected from consenting year 4 participants. This researcher is mindful of her long-standing involvement in the ACE program development and is cognizant of the role this prior work with the project may play in her understandings of this research effort.
COVID-19 Considerations

The COVID-19 pandemic did not impact data for this study since the data were collected between 2018 and 2019. However, the pandemic impacted the multi-year follow-up assessment plan. Researchers scheduled a two-year follow-up assessment for April 2020, but school closures in March 2020 prevented this from occurring. Once schools reopened in August 2020, schools restricted visitors and outside service to essential activity only, so researchers could not conduct the three-year follow-up assessment in the 2020-2021 school year. While the one-year follow-up data were collected pre-pandemic, any further follow-up assessments should consider the encompassing impact of COVID-19 on students' academic and psychosocial functioning.

Research Questions

This study addresses the following research questions in the realm of intervention targets one year after completion of the ACE program.

1. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their utilization of:
   a) Approach-problem focused coping strategies (time and task management, turn to family, seek academic support, positive thinking, relaxation, turn to spirituality)?
   b) Alone/avoidance coping strategies (withdraw/rely on self, skip school, substance use, reduce effort on schoolwork, take shortcuts, sleep)?

2. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of:
   a) Affective engagement,
b) Cognitive engagement,

c) Behavioral engagement,

d) Achievement motivation?

3. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of eustress?

This study addresses the following research questions in the realm of intervention outcomes one year after completion of the ACE program.

4. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in mental health outcomes including:

   a) Positive affect,

   b) Life satisfaction,

   c) Psychopathology,

   d) Academic burnout?

5. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in academic outcomes including:

   a) GPA,

   b) AP exam scores,

   c) Participation in AP classes and/or the pre-IBDP program?

6. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in
their qualification for selective Tier 2 support (demonstrate academic or emotional risk factors) using the screening qualification validated in Suldo et al. (2019)?

Data Analysis

Data analyzed came from the one-year follow-up survey packet given in spring 2019 and school records provided in summer 2019. The participants (n=336) in this study were nested within their school program (n=15). To compare the features of the year 3 and year 4 sample, baseline levels of variables were examined to determine if differential attrition occurred. The resulting description of the representativeness of the year 4 sample contextualizes the generalization of results. Statistical advisors were consulted throughout the analysis process to support sound analysis techniques based on the data structure.

Descriptive statistics were used to assess the soundness of the data. Measure reliability (Cronbach’s alpha), skewness, and kurtosis was calculated for each measure in the current sample for the treatment and control group. The data was also checked for outlier values, but none were found. Students with the minimum number of items required for analysis for each individual subscale (Appendix H) were included in the analysis. Means and standard deviations for each intervention target and outcome were be calculated for each condition (Intervention [ACE] and Business as Usual [BAU]).

To assess the treatment effect in questions 1 through 5b, the statistical procedures from Suldo et al., (2022) were utilized. First, an unconditional model was initially run to estimate the ICCs. The equation for this first model was $Y_{ij} = \beta_0 + u_j + e_{ij}$. A second model was run to calculate the variances used to standardize the effect, which accounted for treatment status. The equation for the second model was $Y_{ij} = \beta_0 + \beta_1 X_{1j} + u_j + e_{ij}$. Then, a third model was run for each intervention target and outcome, to assess treatment effects while controlling for the
treatment condition, pre-assessment level of the intended intervention target or outcome, and the grouping of the school based on district and program type. The equation for this model was $Y_{ij} = \beta_0 + \beta_1 X_{1j} + \beta_2 X_{2j} + \sum_{h=3}^7 \beta_h X_{hj} + u_j + e_{ij}$, where $Y_{ij}$ is the outcome for student $i$ in program $j$, $X_{1j}$ is a treatment indicator variable coded 0 for programs assigned to BAU and 1 for programs assigned to treatment, $X_{2j}$ is a program level variable indexing the average status of the students on the outcome prior to starting the intervention (i.e., the mean pre-assessment score in program $j$ for the corresponding engagement, coping, or mental health variables), and $X_{hj}$ are dummy coded indicator variables to account for the grouping of school programs based on district and program type.

The standardized effect size measure was obtained by dividing $\hat{\beta}$ by $\sqrt{\hat{\sigma}_w^2 + \hat{\sigma}_b^2}$, where $\hat{\sigma}_w^2$ and $\hat{\sigma}_b^2$ come from the variance estimates of $e_{ij}$ and $u_j$, respectively, from a multilevel model that included only the treatment indicator (i.e., the variances from the second model). Given the positive results of the overall intervention effect as reported by Ferron et al. (2021), this study focused on determining the magnitude of intervention effects along with significance testing.

To answer research question 5c (continued participation in AP/IB) and 6 (qualification for Tier 2 services) a dichotomous dependent variable was created. The dichotomous variable for question 5c sorted participants into the yes category (currently participating in AP/IB) or no category (not currently taking any AP/IB classes). The dichotomous variable for question 6 put participants into the category of qualifying for Tier 2 support or not qualifying for Tier 2 support. Cut scores from Suldo et al. (2019) were used to classify if students qualify for Tier 2 support. Students with at least one emotional or academic risk factor qualified for Tier 2 support. To be classified as at-risk emotionally, students had a PSS score > 3.6 or a score < 3.4 on the School Satisfaction Scale on the MSLSS. For academic performance, an unweighted GPA < 3.0.
identified academic risk. The scores used to determine risk from Suldo et al. (2019) were validated in AP/IB students and are the most applicable scores for the current study population. Since both dependent variables are categorical, a chi-squared analysis was used to predict if there is a difference between the treatment and control group in continued participation in AP/IB classes and qualification for Tier 2 support. While a categorical data analysis was considered, this generalized mixed linear model was not run because the number of programs needed to be bigger to estimate the model parameters accurately. Also, repeated models estimating the ICCs produce small values suggesting little to no nesting to take into account.

Not every student from the grant year 3 randomized sample participated in the current study. Therefore, there may be other factors that contribute to the similarities or differences found in the analyses. Also, this longitudinal view of the ACE study only extends one-year post-intervention so conclusions about follow-up effects should be interpreted with this timeframe in mind. These limitations are discussed further in Chapter Five. The information gleaned from these analyses should be interpreted with the above considerations in mind.
CHAPTER FOUR: RESULTS

This chapter details the results of the data analysis techniques used to answer this study's research questions. First, the data entry and screening process will be described, along with the study's participant demographic information. Then, each research question will detail the various data analysis methods used to examine the variables of interest for each question. The results are framed in this way to provide a complete understanding of the research question by simplifying the ability to reference all analysis outcomes for the construct in question.

Research Questions

The subsequent analyses included in this chapter addressed the following research questions related to intervention targets and outcomes one year after completion of the ACE program:

1. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their utilization of:

   a) Approach-problem-focused coping strategies (Time and Task Management, Turn to Family, Seek Academic Support, Positive Thinking, Relaxation, Turn to Spirituality)?

   b) Alone/avoidance coping strategies (Withdraw/Rely on Self, Skip School, Substance Use, Reduce Effort on Schoolwork, Take Shortcuts, Sleep)?
2. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of:
   a) Affective engagement,
   b) Cognitive engagement,
   c) Behavioral engagement,
   d) Achievement motivation?

3. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their levels of eustress?

4. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in mental health outcomes, including:
   a) Positive affect,
   b) Life satisfaction,
   c) Psychopathology,
   d) Academic burnout?

5. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in academic outcomes, including:
   a) GPA,
   b) AP exam scores,
   c) Participation in AP classes and/or the pre-IBDP program?
6. To what degree, if any, do the AP/pre-IBDP students in the two different conditions (Intervention [ACE] versus Business as Usual [BAU]) at the one-year follow-up differ in their qualification for selective Tier 2 support (demonstrate academic or emotional risk factors) using the screening qualification validated in Suldo et al. (2019)?

For research questions 1-5b, descriptive statistics are presented, followed by an attrition analysis to determine if any significant differences existed between the current sample and the attrited participants on baseline variables. Since only 61.4% of the year 3 participants comprised the year 4 sample, the attrition analysis determined how representative the current sample group was to the full sample (year 3 participants) on baseline variables. This analysis helped determine if the differences between the non-attrited group (current study participants) and the attrited group (participants who did not complete a follow-up survey) were random or attributable to a particular factor. It should be noted that low statistical power may have resulted from the small number of units of analysis (15 school program), so all differential attrition effects may not have been identified. Next, hierarchical linear modeling (HLM) analyses provided information regarding the directionality and significance of the various constructs between the treatment and control groups on the one-year follow-up variables.

Research questions 5c-6 required a different analytical technique since the outcome of interest was dichotomous instead of continuous. A chi-squared analysis was used for these questions to determine if significant differences occurred between the treatment and control groups. While a categorical data analysis that accounted for data nesting was considered, a generalized mixed linear model was not chosen because the small number of school programs would hinder accurate model parameters. Also, repeated models estimating the ICCs of these
variables at different timepoints consistently produced small values suggesting little to no nesting that needed accounting for.

**Data Screening**

Data from survey packets completed by participating students were entered by graduate-level research assistants into a database using optical scanner software. Researchers checked at least 10% of the participants’ survey packets for accuracy. In the case of a single answer item where a participant chose multiple responses, a coin toss determined which marked item to retain. Researchers corrected data entry errors in the database and subsequently checked surveys occurring before and after the survey with an identified error for accuracy. Statistics professors involved with this project also checked the datasets for other systemic errors (e.g., out-of-range item responses).

**Missing Data.** Overall, the rates of missing participants' survey responses are meager (<1% missing data). Research assistants checked student forms for missing items upon completion and offered the student the opportunity to fill in any missing items. Missing data only excluded students from the constructs that could not be calculated due to the deletion.

**Sample Demographics**

The current study participants (N= 336) included 10th-grade AP/pre-IBD students who were formerly in the year 3 study when in 9th grade. From the original sample of 547 participants, the current sample consisted of 61.4% of the year 3 participants. In this study, the participants were mainly 15 years old (93.45%), and most were female (66.37%). Regarding the program category, 63% (n=213) were enrolled in AP courses, and 36% (n= 123) were in the pre-IBD program. For the treatment status, 58% of the sample was in the treatment group (n=198), and 41% was in the control group (n=138). These demographics closely approximate the year 3
sample, when 64% of participants were in AP classes and 35.8% in the pre-IBD program, 64% in the treatment, and 35% in the control conditions. In the year 4 study, participants were mainly white (43.8%), followed by Hispanic (22.6%), Asian (14.3%), multi-racial (12.5%), and Black (6.9%). The year 4 sample closely mirrors the year 3 sample in terms of the racial composition of the sample, with the year 3 sample identification as follows: 47% identified as White, 21% as Hispanic, 11% Asian, 14% multiracial, and 7% Black (Ferron et al., 2021). A comparison of the sample demographic variables at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix J.

**Coping (Question 1)**

**Descriptive Statistics.** The coping construct consisted of six approach-focused strategies and six avoidance strategies. Descriptive statistics were analyzed to assess the reliability and normality of each measure in the one-year follow-up sample (collected at the end of 10th grade). Table 9 displays the alpha, mean, standard deviation, skewness, and kurtosis for the one-year follow-up sample by treatment condition.

The various coping factors consist of two to six items on the CADS. The factors with alphas below 0.70 consisted of two or three items, while the other scales consisted of four to six items. The skewness and kurtosis of the coping variables were normal, with values ranging between -2 and 2, for all variables except substance use. The skewness of the substance use variable in the treatment group was 4.02 and 3.69 in the control group. The kurtosis was 16.86 in the treatment group and 15.09 in the control group. These values reflect that the base rate for this variable is low in this population.
Table 9:

Descriptive Statistics of the Coping Construct for the One-Year Follow-Up Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alpha</th>
<th>Condition</th>
<th>Mean/SD</th>
<th>Skew/Kurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time and Task Management</td>
<td>.78</td>
<td>Tx</td>
<td>3.29/0.83</td>
<td>-0.31/-0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.10/0.77</td>
<td>0.05/-0.67</td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>.81</td>
<td>Tx</td>
<td>3.59/0.89</td>
<td>-0.39/-0.31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.51/0.89</td>
<td>-0.40/-0.38</td>
</tr>
<tr>
<td>Seek Academic Support</td>
<td>.60</td>
<td>Tx</td>
<td>2.55/0.87</td>
<td>0.33/-0.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.40/0.76</td>
<td>0.50/-0.26</td>
</tr>
<tr>
<td>Turn to Family</td>
<td>.84</td>
<td>Tx</td>
<td>2.83/1.06</td>
<td>0.20/-0.80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.79/1.06</td>
<td>0.41/-0.59</td>
</tr>
<tr>
<td>Spirituality</td>
<td>.91</td>
<td>Tx</td>
<td>2.02/1.22</td>
<td>0.97/-0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>1.98/1.13</td>
<td>1.01/-0.01</td>
</tr>
<tr>
<td>Relaxation</td>
<td>.53</td>
<td>Tx</td>
<td>3.06/0.96</td>
<td>0.06/-0.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.96/0.91</td>
<td>0.30/-0.40</td>
</tr>
<tr>
<td>Alone</td>
<td>.69</td>
<td>Tx</td>
<td>3.53/0.77</td>
<td>-0.25/-0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.43/0.83</td>
<td>-0.31/-0.35</td>
</tr>
<tr>
<td>Skip School</td>
<td>.85</td>
<td>Tx</td>
<td>1.73/0.90</td>
<td>1.28/1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>1.68/0.84</td>
<td>1.29/1.04</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.74</td>
<td>Tx</td>
<td>1.12/0.37</td>
<td>4.02/16.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>1.19/0.55</td>
<td>3.69/15.09</td>
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<tr>
<td>Reduce Effort</td>
<td>.80</td>
<td>Tx</td>
<td>2.18/0.87</td>
<td>0.81/0.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.27/0.88</td>
<td>0.62/0.17</td>
</tr>
<tr>
<td>Sleep</td>
<td>.85</td>
<td>Tx</td>
<td>2.64/1.16</td>
<td>0.35/-0.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.88/1.19</td>
<td>0.11/-0.92</td>
</tr>
<tr>
<td>Take Short Cuts</td>
<td>.50</td>
<td>Tx</td>
<td>2.11/0.78</td>
<td>0.43/-0.53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.23/0.74</td>
<td>0.23/-0.53</td>
</tr>
</tbody>
</table>

Note: Coping factors taken from the CADS (Suldo, et al., 2015). Sample size (N)= 336.
The various coping factors consist of two to six items on the CADS. The factors with alphas below 0.70 consisted of two or three items, while the other scales consisted of four to six items. The skewness and kurtosis of the coping variables were normal, with values ranging between -2 and 2, for all variables except substance use. The skewness of the substance use variable in the treatment group was 4.02 and 3.69 in the control group. The kurtosis was 16.86 in the treatment group and 15.09 in the control group. These values reflect that the base rate for this variable is low in this population.

**Attrition Analysis.** An attrition analysis determined if any significant differences existed in the baseline coping variables, collected at the beginning of 9th grade, between the group who participated in the follow-up assessment and those who attritted. Using a two-by-two factorial ANOVA of condition and attrition, the interaction of the attritted and non-attritted groups in the treatment and control conditions was analyzed on baseline variables. In this analysis, a significant interaction ($p < .05$) is suggestive of differential attrition effects. A non-significant interaction value indicates that the current study participants did not have significant differences in that particular variable from the students who did not complete a follow-up survey. Table 10 shows the results of the attrition analysis for the coping construct on baseline variables (collected at the beginning of 9th grade).

No variables emerged as significant, indicating that differential attrition effects did not affect the coping variables. The students in the current study sample have no significant differences in the various coping variables at baseline compared to those who did not participate.
Table 10:

Attrition Analysis of the Coping Construct on Baseline Variables

<table>
<thead>
<tr>
<th>Baseline Variable (Collected at the beginning of 9th grade)</th>
<th>Condition</th>
<th>Attritted Group Mean</th>
<th>Non-Attritted Group Mean</th>
<th>Interaction p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time and Task Management</td>
<td>Tx</td>
<td>3.25</td>
<td>3.43</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.35</td>
<td>3.37</td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>Tx</td>
<td>3.28</td>
<td>3.52</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.44</td>
<td>3.42</td>
<td></td>
</tr>
<tr>
<td>Seek Academic Support</td>
<td>Tx</td>
<td>2.54</td>
<td>2.63</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.63</td>
<td>2.60</td>
<td></td>
</tr>
<tr>
<td>Turn to Family</td>
<td>Tx</td>
<td>2.94</td>
<td>2.91</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.94</td>
<td>2.95</td>
<td></td>
</tr>
<tr>
<td>Spirituality</td>
<td>Tx</td>
<td>2.21</td>
<td>2.37</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.30</td>
<td>2.31</td>
<td></td>
</tr>
<tr>
<td>Relaxation</td>
<td>Tx</td>
<td>3.01</td>
<td>2.98</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.85</td>
<td>3.02</td>
<td></td>
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<tr>
<td>Skip School</td>
<td>Tx</td>
<td>1.46</td>
<td>1.33</td>
<td>0.72</td>
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<td></td>
<td>Control</td>
<td>1.46</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>Substance Use</td>
<td>Tx</td>
<td>1.10</td>
<td>1.03</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>1.06</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Reduce Effort</td>
<td>Tx</td>
<td>2.02</td>
<td>1.77</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>1.95</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>Tx</td>
<td>2.58</td>
<td>2.55</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.58</td>
<td>2.59</td>
<td></td>
</tr>
<tr>
<td>Take Short Cuts</td>
<td>Tx</td>
<td>1.78</td>
<td>1.71</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>1.76</td>
<td>1.81</td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>Tx</td>
<td>3.28</td>
<td>3.30</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.24</td>
<td>3.07</td>
<td></td>
</tr>
</tbody>
</table>

Note. *=p*-value significant at the .05 level
Hierarchical Linear Modeling. Hierarchical Linear Modeling assessed the treatment effects on the coping variables at the one-year follow-up timepoint. This multilevel analysis accounted for the treatment status (0= control, 1=treatment), the average status of the students in the outcome at baseline (prior to starting the intervention), and the grouping of students within school programs, which also accounts for variability between district and program type. The Kenward-Roger adjustments to the standard errors and degrees of freedom accounted for the small number of school programs. All the coping models met convergence criteria. Table 11 presents the intraclass correlation coefficient (ICC), effect estimate, standard error, $p$-value, and standardized effect. Positive values indicate desirable standardized effect sizes for approach-focused coping. Negative values indicate desirable standardized effect sizes for avoidance-focused coping.

Table 11:

**HLM Analysis for Coping Construct at One-Year Follow-Up**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ICC</th>
<th>Effect Estimate</th>
<th>SE</th>
<th>$p$-value</th>
<th>Standardized Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approach-focused</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time and Task Management</td>
<td>0.01</td>
<td>0.18</td>
<td>0.10</td>
<td>.12</td>
<td>0.22</td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>0.01</td>
<td>0.02</td>
<td>0.10</td>
<td>.89</td>
<td>0.02</td>
</tr>
<tr>
<td>Seek Academic Support</td>
<td>0.06</td>
<td>0.19</td>
<td>0.12</td>
<td>.18</td>
<td>0.22</td>
</tr>
<tr>
<td>Turn to Family</td>
<td>0</td>
<td>0.09</td>
<td>0.12</td>
<td>.47</td>
<td>0.08</td>
</tr>
<tr>
<td>Spirituality</td>
<td>0.04</td>
<td>0.01</td>
<td>0.13</td>
<td>.93</td>
<td>0.01</td>
</tr>
<tr>
<td>Relaxation</td>
<td>0.01</td>
<td>0.10</td>
<td>0.11</td>
<td>.34</td>
<td>0.11</td>
</tr>
<tr>
<td><strong>Avoidance-focused</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>0.01</td>
<td>0.03</td>
<td>0.10</td>
<td>.75</td>
<td>0.04</td>
</tr>
<tr>
<td>Skip School</td>
<td>0.05</td>
<td>0.06</td>
<td>0.11</td>
<td>.59</td>
<td>0.07</td>
</tr>
<tr>
<td>Substance Use</td>
<td>0.01</td>
<td>-0.07</td>
<td>0.05</td>
<td>.18</td>
<td>-0.15</td>
</tr>
<tr>
<td>Reduce Effort</td>
<td>0</td>
<td>-0.05</td>
<td>0.10</td>
<td>.59</td>
<td>-0.06</td>
</tr>
<tr>
<td>Sleep</td>
<td>0.04</td>
<td>-0.23</td>
<td>0.22</td>
<td>.34</td>
<td>-0.19</td>
</tr>
<tr>
<td>Take Short Cuts</td>
<td>0.12</td>
<td>0.02</td>
<td>0.16</td>
<td>.90</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note. *$p$-value significant at the .05 level. The ICC values come from an unconditional model $Y_{ij} = \beta_0 + u_j + e_{ij}$. The variances used in the standardized effect size calculation come from a model that included only the treatment indicator $Y_{ij} = \beta_0 + \beta_1 X_{1j} + u_j + e_{ij}$. The standardized effect size measure was obtained by dividing $\hat{\beta}$ by $\sqrt{\hat{\sigma}_u^2 + \hat{\sigma}_b^2}$.
The ICC values for the various coping constructs are close to zero, indicating there was little variability between the school programs in the average outcome values. For the approach-focused coping strategies, the standardized effect estimates ranged from 0.01 (spirituality) to 0.22 (time and task management/seek academic support). All standardized effect sizes are in the desired direction for the approach-focused coping strategies, but no strategy emerged as significant at the \(p<.05\) level. For the avoidance coping strategies, the standardized effect estimates ranged from -0.19 (sleep) and 0.04 (alone). The standardized effect size was in the desired direction for substance use, reduce effort, and sleep. No strategy emerged as significant at the \(p<.05\) level. A comparison of the \(p\)-value and standardized effect size for the coping variables at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix K.

**Engagement (Question 2)**

**Descriptive Statistics.** The engagement construct was multifaceted and consisted of different aspects of engagement, including affective, behavioral, cognitive, and achievement motivation. First descriptive statistics assessed the reliability and normality of each measure in the follow-up sample (collected at the end of 10th grade). Table 12 displays the alpha, mean, standard deviation, skewness, and kurtosis for the one-year follow-up sample by treatment condition. It should be noted that the behavioral engagement (extracurricular activity) values are z-scores. Z-scores were used for behavioral engagement because two different scales- number of extracurricular activities and time spent within them- needed to be combined to assess this construct fully.
Table 12:

Descriptive Statistics of the Engagement Construct for the One-Year Follow-Up Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alpha</th>
<th>Condition</th>
<th>Mean/SD</th>
<th>Skew/Kurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Engagement(^a) (Positive Emotion)</td>
<td>.87</td>
<td>Tx</td>
<td>2.89/0.62</td>
<td>-0.31/-0.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.75/0.69</td>
<td>-0.24/-0.36</td>
</tr>
<tr>
<td>Affective Engagement(^b) (Belongingness at School)</td>
<td>.80</td>
<td>Tx</td>
<td>2.90/0.48</td>
<td>-0.14/-0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.74/0.48</td>
<td>-0.22/0.13</td>
</tr>
<tr>
<td>Behavioral Engagement(^c) (In-Class Participation)</td>
<td>.76</td>
<td>Tx</td>
<td>3.36/0.51</td>
<td>-1.00/1.55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.22/0.51</td>
<td>-0.47/-0.11</td>
</tr>
<tr>
<td>Behavioral Engagement(^d) (Extracurricular Activities)</td>
<td>.61</td>
<td>Tx</td>
<td>0.04/0.83</td>
<td>-0.21/-0.09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>-0.06/0.85</td>
<td>-0.38/-0.61</td>
</tr>
<tr>
<td>Cognitive Engagement(^e) (Goal Valuation)</td>
<td>.92</td>
<td>Tx</td>
<td>6.46/0.76</td>
<td>-2.46/8.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>6.43/0.72</td>
<td>-1.85/4.51</td>
</tr>
<tr>
<td>Cognitive Engagement(^f) (Motivation/Self-Regulation)</td>
<td>.92</td>
<td>Tx</td>
<td>5.29/1.11</td>
<td>-0.88/0.17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>5.18/1.13</td>
<td>-0.97/0.85</td>
</tr>
<tr>
<td>Achievement Motivation(^g) (Valuing)</td>
<td>.72</td>
<td>Tx</td>
<td>3.03/0.47</td>
<td>-0.49/0.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.93/0.44</td>
<td>0.02/0.33</td>
</tr>
<tr>
<td>Achievement Motivation(^h) (Academic Self-Perceptions)</td>
<td>.88</td>
<td>Tx</td>
<td>5.47/0.92</td>
<td>-0.67/0.49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>5.28/1.01</td>
<td>-0.61/-0.14</td>
</tr>
</tbody>
</table>

Note. \(^a\) Emotional engagement subscale of EVD (Skinner et al., 2009); \(^b\) Belonging Scale of ISQ (Voelkl, 1996); \(^c\) Behavioral Engagement subscale of EVD (Skinner et al., 2009); \(^d\) EAI (Suldo et al., 2018); \(^e\) Goal Valuation scale of the SAAS-R (McCoach & Siegle, 2003); \(^f\) Self-Regulation scale of the SAAS-R (McCoach & Siegle, 2003); \(^g\) Valuing subscale of the ISQ (Voelkl, 1996); \(^h\) Academic Self-Perceptions scale of the SAAS-R R (McCoach & Siegle, 2003). Sample size (N)= 336.

For internal consistency, all variables except for the behavioral engagement (extracurricular activities) scale had an alpha above .70. The behavioral engagement (extracurricular activities) scale had an alpha of .61. The means for affective engagement (positive emotion), affective engagement (belongingness at school), behavioral engagement (in-class participation), behavioral engagement (extracurricular activities), and achievement motivation (valuing) ranged between 2.74 and 3.36. The skewness and kurtosis for these
variables are normal and ranged between -1 and 1. The variables of cognitive engagement (goal valuation), cognitive engagement (motivation/self-regulation), and achievement motivation (academic self-perceptions) had higher means, ranging from 5.18 to 6.46. Cognitive engagement (motivation/self-regulation) and achievement motivation (academic self-perceptions) also had normal skewness and kurtosis values between -1 and 1. Cognitive engagement (goal valuation) had the highest skewness (treatment group: -2.46, control group: -1.85) and the highest kurtosis values (treatment group: 8.67, control group: 4.51).

**Attrition Analysis.** An attrition analysis determined if any significant differences existed on the baseline engagement variables, collected at the beginning of 9th grade, between the group who participated in the follow-up assessment and those who attritted. Using a two-by-two factorial ANOVA of condition and attrition, the interaction of the attritted and non-atrritted groups in the treatment and control conditions was analyzed on baseline variables. In this analysis, a significant interaction ($p < .05$) is suggestive of differential attrition effects. A non-significant interaction value indicates that the current study participants did not have significant differences in that particular variable from the students who did not complete a follow-up survey. Table 13 shows the results of the attrition analysis for the engagement construct on baseline variables (collected at the beginning of 9th grade).

The participants in the treatment and control groups that decided to participate in the follow-up study looked statistically similar on baseline levels of affective engagement (positive emotion), behavioral engagement (in-class participation), behavioral engagement (extracurricular activities), cognitive engagement (goal valuation), compared to their peers who did not participate in the one-year follow-up survey.
Table 13:

**Attrition Analysis for Engagement Construct on Baseline Variables**

<table>
<thead>
<tr>
<th>Baseline Variable (Collected at the beginning of 9th grade)</th>
<th>Condition</th>
<th>Attritted Group Mean</th>
<th>Non-Attritted Group Mean</th>
<th>Interaction p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Engagement (Positive Emotion)</td>
<td>Tx</td>
<td>2.82</td>
<td>3.03</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.94</td>
<td>2.92</td>
<td></td>
</tr>
<tr>
<td>Affective Engagement (Belongingness at School)</td>
<td>Tx</td>
<td>2.78</td>
<td>2.99</td>
<td>0.006*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.92</td>
<td>2.88</td>
<td></td>
</tr>
<tr>
<td>Behavioral Engagement (In-Class Participation)</td>
<td>Tx</td>
<td>3.34</td>
<td>3.34</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.43</td>
<td>3.42</td>
<td></td>
</tr>
<tr>
<td>Behavioral Engagement (Extracurricular Activities)</td>
<td>Tx</td>
<td>-0.20</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.08</td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>Cognitive Engagement (Goal Valuation)</td>
<td>Tx</td>
<td>6.43</td>
<td>6.63</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>6.62</td>
<td>6.63</td>
<td></td>
</tr>
<tr>
<td>Cognitive Engagement (Motivation/Self-Regulation)</td>
<td>Tx</td>
<td>5.30</td>
<td>5.65</td>
<td>0.004*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>5.66</td>
<td>5.43</td>
<td></td>
</tr>
<tr>
<td>Achievement Motivation (Valuing)</td>
<td>Tx</td>
<td>3.00</td>
<td>3.20</td>
<td>0.01*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.19</td>
<td>3.09</td>
<td></td>
</tr>
<tr>
<td>Achievement Motivation (Academic Self-Perceptions)</td>
<td>Tx</td>
<td>5.16</td>
<td>5.53</td>
<td>0.0008*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>5.52</td>
<td>5.24</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* = p-value significant at the .05 level

A significant p-value (p < .05) indicated that differential attrition effects impacted the following variables: affective engagement (belongingness at school), cognitive engagement (motivation/self-regulation), achievement motivation (valuing), and achievement motivation (academic self-perceptions). An identifiable pattern emerged for each variable with a significant interaction p-value for the attrition analysis. At baseline, for the treatment group, means for the current study participants (non-attrition group) were higher than the means of the non-participants (attrition group) on these variables at baseline. For the control group, the means for
the current study participants (non-attrition group) were lower than the mean of the non-participants (attrition group). At one year follow-up, this numerical gap between the treatment and control participants who participated and did not participate was statically significant. These values indicate that in the current study, students in the treatment group with higher scores on the impacted engagement variables at baseline participated significantly more in the current study than their counterparts in the treatment group who reported lower engagement levels. The control group saw the opposite of this pattern. Control group students who participated in the current study had lower scores on the impacted engagement variables than their counterparts in the control group who reported higher engagement levels at baseline. Figure 1 shows a graphical example of this pattern.

Figure 1: Graphical Representation of Differential Attrition Effect for Affective Engagement

This analysis suggests that the difference in those who participated and who did not at the one-year follow-up sample was not random, they meaningfully differed at the start of 9th grade on the engagement variables identified above as significant. Treatment effects on these variables should be evaluated within the context of these differential attrition effects.
Hierarchical Linear Modeling. Hierarchical Linear Modeling assessed the treatment effects on the engagement variables at the one-year follow-up timepoint. This multilevel analysis accounted for the treatment status (0= control, 1=treatment), the average status of the students at baseline, and the grouping of school programs based on district and program type. The Kenward-Roger adjustments to the standard errors and degrees of freedom accounted for the small number of school programs. All the engagement models met convergence criteria. Table 14 presents the intraclass correlation coefficient (ICC), effect estimate, standard error, p-value, and standardized effect. Positive values indicate desirable standardized effect sizes for the engagement variables.

Table 14:

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ICC</th>
<th>Effect Estimate</th>
<th>SE</th>
<th>p-value</th>
<th>Standardized Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective (In-Class Positive Emotions)</td>
<td>0</td>
<td>0.10</td>
<td>0.07</td>
<td>.16</td>
<td>0.16</td>
</tr>
<tr>
<td>Affective (Belongingness at School)</td>
<td>0.07</td>
<td>0.14</td>
<td>0.06</td>
<td>.011*</td>
<td>0.29</td>
</tr>
<tr>
<td>Behavioral (In-Class Participation)</td>
<td>0</td>
<td>0.12</td>
<td>0.06</td>
<td>.038*</td>
<td>0.24</td>
</tr>
<tr>
<td>Behavioral (Excurricular Activities)</td>
<td>0.07</td>
<td>0.20</td>
<td>0.10</td>
<td>.039*</td>
<td>0.23</td>
</tr>
<tr>
<td>Cognitive (Goal Valuation)</td>
<td>0.03</td>
<td>0.05</td>
<td>0.13</td>
<td>.72</td>
<td>0.06</td>
</tr>
<tr>
<td>Cognitive (Self-Regulation)</td>
<td>0</td>
<td>0.06</td>
<td>0.13</td>
<td>.65</td>
<td>0.05</td>
</tr>
<tr>
<td>Achievement Motivation (Value School)</td>
<td>0.02</td>
<td>0.09</td>
<td>0.07</td>
<td>.23</td>
<td>0.20</td>
</tr>
<tr>
<td>Achievement Motivation (Acad Self-Eff)</td>
<td>0.02</td>
<td>0.16</td>
<td>0.11</td>
<td>.15</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Note: *=p-value significant at the .05 level. The ICC values come from an unconditional model \( y_{ij} = \beta_0 + u_j + e_{ij} \). The variances used in the standardized effect size calculation come from a model that included only the treatment indicator \( y_{ij} = \beta_0 + \beta_1 x_{ij} + u_j + e_{ij} \). The standardized effect size measure was obtained by dividing \( \hat{\beta} \) by \( \sqrt{\hat{\sigma}_b^2 + \hat{\sigma}_u^2} \).

Table 14 shows the ICC, effect estimate, p-value, and standardized effect for the different aspects of engagement. For the various engagement constructs, the ICC values are close to zero,
which indicates a low similarity in values. Since the different facets of engagement used rating scales with various numerical scales, this study focuses on the standardized effect size. Results from this analysis indicated that one-year after evaluation of the ACE program, students in the treatment group (i.e., the group that received the intervention) had significantly higher levels of engagement in the areas of affective engagement (belongingness at school) and behavioral engagement (in-class participation, and extracurricular activities) compared to their control group counterparts. Referencing the attrition analysis above, of these significant variables, only affective engagement (belongingness at school) was significant for differential attrition effects, which is important to recognize when contextualizing these effects. Both aspects of cognitive engagement and achievement motivation had standardized effect sizes in the desired direction, but they did not emerge as statistically significant. A comparison of the $p$-value and standardized effect size for the engagement variables at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix L.

**Eustress (Question 3)**

**Descriptive Statistics.** Descriptive statistics were analyzed to assess the reliability and normality of the eustress measure in the one-year follow-up sample (collected at the end of 10th grade). Table 15 displays the alpha, mean, standard deviation, skewness, and kurtosis for the one-year follow-up sample by treatment condition.

The mean of eustress in the treatment group was 3.37 and the mean in the control group was 2.92. The variable of eustress demonstrated sound psychometric properties in regard to its alpha, skewness, and kurtosis values.
Table 15:

Descriptive Statistics for Eustress for the One-Year Follow-Up Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alpha</th>
<th>Condition</th>
<th>Mean/SD</th>
<th>Skew/Kurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustress⁹</td>
<td>.90</td>
<td>Tx</td>
<td>3.37/1.03</td>
<td>0.04/-0.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>2.92/1.13</td>
<td>0.36/-0.01</td>
</tr>
</tbody>
</table>


Attrition Analysis. An attrition analysis determined if any significant differences existed on the baseline eustress variable between the group who participated in the follow-up assessment and those who attritted. Table 16 shows the results of the attrition analysis for eustress at baseline (collected at the beginning of 9th grade).

Table 16:

Attrition Analysis for Eustress on Baseline Levels

<table>
<thead>
<tr>
<th>Baseline Variable</th>
<th>Condition</th>
<th>Attritted Group Mean</th>
<th>Non-Attritted Group Mean</th>
<th>Interaction p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustress</td>
<td>Tx</td>
<td>2.50</td>
<td>2.82</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.66</td>
<td>2.63</td>
<td></td>
</tr>
</tbody>
</table>

Note. *=p-value significant at the .05 level

The interaction term was not significant, indicating that eustress was not affected by attrition effects. This finding indicates that the current student participants did not have any significant differences in their level of eustress at baseline compared to their peers that did not participate in the present study.

Hierarchical Linear Modeling. Hierarchical Linear Modeling assessed the treatment effects on eustress at the one-year follow-up. This multilevel analysis accounted for the treatment status (0= control, 1=treatment), the average status of the students in the outcome at baseline, and the grouping of school programs based on district and program type. The Kenward-Roger adjustments to the standard errors and degrees of freedom accounted for the small number of
school programs. The eustress model met convergence criteria. Table 17 presents the intraclass correlation coefficient (ICC), effect estimate, standard error, \( p \)-value, and standardized effect at one-year follow-up. Positive values indicate a desirable standardized effect size for eustress.

**Table 17:**

HLM Analysis for Eustress at One-Year Follow-Up

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ICC</th>
<th>Effect Estimate</th>
<th>SE</th>
<th>( p )-value</th>
<th>Standardized Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustress</td>
<td>0.06</td>
<td>0.41</td>
<td>0.14</td>
<td>.0292*</td>
<td>0.38</td>
</tr>
</tbody>
</table>

*Note.* \( *=p \)-value significant at the .05 level. The ICC values come from an unconditional model \( Y_{ij} = \beta_0 + u_j + e_{ij} \). The variances used in the standardized effect size calculation come from a model that included only the treatment indicator \( Y_{ij} = \beta_0 + \beta_1 X_{ij} + u_j + e_{ij} \). The standardized effect size measure was obtained by dividing \( \hat{\beta} \) by \( \sqrt{\hat{\sigma}_b^2 + \hat{\sigma}_u^2} \).

A positive treatment effect was found for eustress, as there was a significant difference between the treatment and control group (\( p = .0292 \)) at one-year follow-up, with a standardized effect estimate of 0.38. This finding indicates that one-year post-intervention, students who received the ACE program (treatment group) had significantly higher levels of eustress than their counterparts who did not receive the intervention (control group). A comparison of the \( p \)-value and standardized effect size for eustress at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix M.

**Mental Health (Question 4)**

**Descriptive Statistics.** The outcome of mental health included positive indicators: subjective well-being (positive affect and life satisfaction), and negative indicators: psychopathology (internalizing and externalizing problems), and academic burnout. Descriptive statistics were analyzed to assess the reliability and normality of each measure in the follow-up sample (collected at the end of 10th grade). Table 18 displays the alpha, mean, standard deviation, skewness, and kurtosis for the follow-up sample by treatment condition. Table 18
displays the alpha, mean, standard deviation, skewness, and kurtosis for the mental health outcomes for the one-year follow-up sample by treatment condition.

**Table 18:**

*Descriptive Statistics for Mental Health Outcomes for the One-Year Follow-Up Sample*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Alpha</th>
<th>Condition</th>
<th>Mean/SD</th>
<th>Skew/Kurt</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Affect</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.89</td>
<td>Tx</td>
<td>3.22/0.96</td>
<td>0.04/-0.79</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.14/0.85</td>
<td>0.21/-0.30</td>
</tr>
<tr>
<td><strong>Life Satisfaction</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.88</td>
<td>Tx</td>
<td>4.24/0.98</td>
<td>-0.30/-0.27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>4.19/0.98</td>
<td>-0.44/-0.34</td>
</tr>
<tr>
<td><strong>Academic Burnout</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.88</td>
<td>Tx</td>
<td>3.65/1.16</td>
<td>-0.16/-0.66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>3.67/1.08</td>
<td>-0.10/-0.73</td>
</tr>
</tbody>
</table>

*Psychopathology*

| Internalizing problems<sup>d</sup> | .87   | Tx        | 0.78/0.58  | 0.38/-0.93 |
|                                    |       | Control   | 0.75/0.58  | 0.48/-0.93 |
| Externalizing problems<sup>e</sup> | .68   | Tx        | 0.34/0.29  | 0.85/0.25  |
|                                    |       | Control   | 0.39/0.32  | 0.60/-0.42 |

*Note.*<sup>a</sup> Positive Affect subscale of PANAS-C-10 (Ebesutani et al., 2012); <sup>b</sup>Student Life Satisfaction Scale (Huebner, 1991); <sup>c</sup>SBI ((Salmela-Aro et al., 2009); <sup>d</sup>Internalizing Problems composite of BPM (Achenbach et al., 2011); <sup>e</sup>Externalizing Problems composite of BPM (Achenbach et al., 2011). Sample size (N)= 336.

The means for all variables are similar between the treatment and control group. All variables seem to demonstrate sound psychometric properties.

**Attrition Analysis.** An attrition analysis determined if any significant differences existed on baseline mental health variables, collected at the beginning of 9<sup>th</sup> grade, between the group who participated in the follow-up assessment and those that attritted. Table 19 shows the results of the attrition analysis for the mental health outcomes on baseline variables (collected at the beginning of 9<sup>th</sup> grade).
Table 19:

Attrition Analysis for Mental Health Outcomes at Baseline

<table>
<thead>
<tr>
<th>Baseline Variable</th>
<th>Condition</th>
<th>Attritted Group Mean</th>
<th>Non-Attritted Group Mean</th>
<th>Interaction p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Burnout</td>
<td>Tx</td>
<td>3.47</td>
<td>3.08</td>
<td>0.012*</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.02</td>
<td>3.16</td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>Tx</td>
<td>3.08</td>
<td>3.32</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.27</td>
<td>3.34</td>
<td></td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>Tx</td>
<td>4.22</td>
<td>4.33</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>4.35</td>
<td>4.29</td>
<td></td>
</tr>
<tr>
<td>Internalizing Problems</td>
<td>Tx</td>
<td>1.47</td>
<td>1.46</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>1.48</td>
<td>1.51</td>
<td></td>
</tr>
<tr>
<td>Externalizing Problems</td>
<td>Tx</td>
<td>1.20</td>
<td>1.14</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>1.18</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

*Note.* *=p*-value significant at the .05 level

No attrition effects were noted for positive affect, life satisfaction, internalizing problems, and externalizing problems. Differential attrition effects impacted academic burnout. This variable follows the same pattern as the engagement variables described above; however, lower scores are desirable for this variable. The mean for the treatment group in the non-attrition group was lower than the mean of the attrition group on academic burnout at baseline. These values indicate that in the current study, students in the treatment group with lower scores on academic burnout at baseline participated significantly more in the current study than their counterparts in the treatment group who reported higher academic burnout levels. The control group saw the opposite of this pattern. Control group students who participated in the current study had higher scores on the academic burnout variable than their counterparts in the control group who reported lower academic burnout levels at baseline. Treatment effects on academic burnout should be evaluated within the context of the differential attrition effects.
Hierarchical Linear Modeling. Hierarchical Linear Modeling assessed the treatment effects on the mental health variables at one-year follow-up. This multilevel analysis accounted for the treatment status (0= control, 1=treatment), the average status of the students at baseline, and the grouping of school programs based on district and program type. The Kenward-Roger adjustments to the standard errors and degrees of freedom accounted for the small number of school programs. All the mental health models met convergence criteria. Table 20 presents the intraclass correlation coefficient (ICC), effect estimate, standard error, $p$-value, and standardized effect. Positive values indicate desirable standardized effect sizes for positive affect and life satisfaction. Negative values indicate desirable standardized effect sizes for psychopathology (internalizing problems and externalizing problems) and academic burnout.

**Table 20:**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ICC</th>
<th>Effect Estimate</th>
<th>SE</th>
<th>$p$-value</th>
<th>Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>0.01</td>
<td>0.05</td>
<td>0.11</td>
<td>.69</td>
<td>0.05</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>0</td>
<td>0.07</td>
<td>0.11</td>
<td>.51</td>
<td>0.08</td>
</tr>
<tr>
<td>Academic Burnout</td>
<td>0.01</td>
<td>-0.02</td>
<td>0.14</td>
<td>.90</td>
<td>-0.02</td>
</tr>
<tr>
<td><strong>Psychopathology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalizing Problems</td>
<td>0.03</td>
<td>0.005</td>
<td>0.08</td>
<td>.95</td>
<td>0.01</td>
</tr>
<tr>
<td>Externalizing Problems</td>
<td>0.02</td>
<td>-0.08</td>
<td>0.04</td>
<td>.039*</td>
<td>-0.25</td>
</tr>
</tbody>
</table>

*Note.*= $p$-value significant at the .05 level. The ICC values come from an unconditional model $Y_{ij} = \beta_0 + u_j + e_{ij}$. The variances used in the standardized effect size calculation come from a model that included only the treatment indicator $Y_{ij} = \beta_0 + \beta_1 X_{1j} + u_j + e_{ij}$. The standardized effect size measure was obtained by dividing $\hat{\beta}$ by $\sqrt{\hat{\sigma}_u^2 + \hat{\sigma}_b^2}$.

The ICC values for the various mental health constructs are close to zero, indicating low similarity. Externalizing problems emerged as significant ($p<.05$) with a standardized effect of -0.25. These data indicate that the treatment group reported significantly lower externalizing problems at one-year post intervention. At the end of 10th grade, students who participated in the ACE program reported significantly fewer externalizing problems than their counterparts who
did not receive the ACE intervention; however, descriptively the externalizing problems rating scale means for both the treatment and control group were both low (mean of 0.34 and 0.39 respectively). Academic burnout, positive affect, and life satisfaction were not significant, but the standardized effect value was in the desired direction. Internalizing problems was non-significant with an effect size very close to zero. A comparison of the p-value and standardized effect size for the mental health outcomes at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix N.

**Academic Outcomes (Question 5a, 5b)**

**Descriptive Statistics.** Academic outcomes consisted of 10th-grade GPA, which represents academic performance for the entire 10th grade year, and a student's average of all 10th-grade AP exam scores. Descriptive statistics were analyzed to assess the reliability and normality of each variable in the follow-up sample (collected at the end of 10th grade). Table 21 displays the mean, standard deviation, skewness, and kurtosis for the one-year follow-up sample by treatment condition. An attrition analysis was not feasible for this construct because there is no baseline comparison variable due to the fact these academic variables are specific to 10th grade performance.

Both variables demonstrate sound psychometric properties. The 10th-grade GPA for the control group had a high kurtosis value of 4.95, likely because average 10th grade GPA is close to the top range value of 4.0.
Table 21:

**Descriptive Statistics for Academic Outcomes for the One-Year Follow-Up Sample**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>Mean/SD</th>
<th>Skew/Kurt</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th grade GPA^a</td>
<td>Tx</td>
<td>3.42/0.57</td>
<td>-1.30/1.34</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>3.46/0.58</td>
<td>-1.82/4.95</td>
</tr>
<tr>
<td>Average 10th grade AP exam score^b</td>
<td>Tx</td>
<td>3.06/1.03</td>
<td>-0.05/-0.49</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>2.75/1.09</td>
<td>0.26/-0.51</td>
</tr>
</tbody>
</table>

Note. ^a Grade Point Average ranges between 0 to 4.0; ^b AP exam scores range from 1 to 5. Sample size (N)= 336.

**Hierarchical Linear Modeling.** Hierarchical Linear Modeling assessed the treatment effects on the academic variables for the one-year follow-up sample. This multilevel analysis accounted for the treatment status (0= control, 1=treatment) and the grouping of school programs based on district and program type. The Kenward-Roger adjustments to the standard errors and degrees of freedom accounted for the small number of school programs. All the academic models met convergence criteria. Table 22 presents the intraclass correlation coefficient (ICC), effect estimate, standard error, \( p \)-value, and standardized effect. Positive values indicate desirable standardized effect sizes.

Neither variable produced a significant effect between treatment groups. The Average AP Exam score variable was in the desired direction; however, the 10th-grade GPA variable was not in the desired direction. Even though the 10th-grade GPA variable was not in the desired direction, students in both the treatment group and the control group reported an above average GPA (treatment group mean GPA: 3.42, control group mean GPA: 3.46). A comparison of the \( p \)-value and standardized effect size for the academic outcomes at one-year follow-up (year 4) and post-intervention (year 3) can be found in Appendix O.
Table 22:

HLM for Academic Outcomes in 10th grade

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>ICC</th>
<th>Effect Estimate</th>
<th>SE</th>
<th>p-value</th>
<th>Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>10th grade GPA</td>
<td>0.03</td>
<td>-0.09</td>
<td>0.07</td>
<td>.28</td>
<td>-0.15</td>
</tr>
<tr>
<td>Average AP Exams</td>
<td>0.15</td>
<td>0.11</td>
<td>0.20</td>
<td>.60</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Note. * = p-value significant at the .05 level. The ICC values come from an unconditional model \( Y_{ij} = \beta_0 + u_j + e_{ij} \). The variances used in the standardized effect size calculation come from a model that included only the treatment indicator \( Y_{ij} = \beta_0 + \beta_1 x_{ij} + u_j + e_{ij} \). The standardized effect size measure was obtained by dividing \( \hat{\beta} \) by \( \sqrt{\hat{\sigma}_u^2 + \hat{\sigma}_e^2} \).

Retention (Question 5c)

A chi-squared analysis assessed the differences in continued participation in AP or pre-IBP classes in 10th grade for students in the different treatment conditions. At the one-year follow-up survey, students reported whether or not they were still enrolled in either AP classes or the IB program. Students who answered "yes" to either participating in AP or pre-IBD classes were counted as continued participation. Students who marked "no" to both items assessing current participation in AP and pre-IBD classes were placed in the non-participation group. Table 23 shows the percentage of participants in each treatment condition who were still enrolled in AP or pre-IBD classes in 10th grade.

Table 23:

Chi-Squared Analysis of AP/Pre-IBP Participation in 10th grade

<table>
<thead>
<tr>
<th>Condition</th>
<th>Continued Participation in AP/pre-IBD classes</th>
<th>Non-participation</th>
<th>Chi-Squared p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx</td>
<td>87.68%</td>
<td>12.32%</td>
<td>0.004*</td>
</tr>
<tr>
<td>Control</td>
<td>75.71%</td>
<td>24.29%</td>
<td></td>
</tr>
</tbody>
</table>

Note. * = p-value significant at the .05 level

The analysis indicates that in the control group, 75.71% of the sample continued participating in AP/pre-IBD classes in 10th grade, while 24.29% did not participate in these rigorous classes during sophomore year. For the treatment group, 87.68% of students were
enrolled in AP/pre-IBD classes sophomore year, while only 12.32% of students in this condition did not participate in rigorous classes in 10th grade. This difference in participation between treatment conditions is statistically significant, $X^2(1, N=343) = 8.34, p < .05$, indicating that reliably more students in the treatment condition continued to participate in rigorous classes than participants in the control group, the year following a universal intervention (ACE) for students in the treatment group only.

**Tier 2 Support (Question 6)**

To assess the need for Tier 2 support, Suldo et al. (2019) validated specific qualifications indicating the need for additional support in the AP/pre-IBD population. These criteria included scores >3.6 on a measure of perceived stress, scores of <3.4 on a measure of school engagement, or a GPA less than 3.0. Students who met at least one of these conditions were considered candidates for Tier 2 support. A chi-squared analysis compared how many students in the different treatment conditions qualified for Tier 2 support in 10th grade. Table 24 shows the percentage of participants in each condition that met the threshold for Tier 2 support.

**Table 24:**

*Chi-Squared Analysis of Need for Tier 2 Support in 10th grade*

<table>
<thead>
<tr>
<th>Condition</th>
<th>No need for Tier 2 support</th>
<th>Need for Tier 2 support</th>
<th>Chi-Squared P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx</td>
<td>50.74%</td>
<td>49.26%</td>
<td>0.19</td>
</tr>
<tr>
<td>Control</td>
<td>43.57%</td>
<td>56.43%</td>
<td></td>
</tr>
</tbody>
</table>

*Note. *=p-value significant at the .05 level*

This analysis indicates that in the control group, 43.57% did not qualify for Tier 2 support, while 56.43% of students indicated the need for Tier 2 support. In the treatment group, 50.74% of students did not meet the threshold for Tier 2 support, while 49.26% of students in this condition qualified for Tier 2 support. These percentages show 7% fewer students in the
treatment condition demonstrated a need for Tier 2 support, but this difference is not statistically significant, $X^2(1, N=343) = 1.71, p = 0.19$. 
CHAPTER FIVE: DISCUSSION

This study examined the one-year follow-up data (collected 2018-2019) from the universal SEL program, Advancing Coping and Engagement (ACE), implemented in 9th grade AP and pre-IBD classes during the 2017-2018 school year. The ACE program consisted of support provided throughout the 9th-grade year, including Tier 1 support (class-wide modules) delivered in the fall and Tier 2 support for at-risk students (1-2 individual meetings) provided in the spring. Before the implementation of the ACE program began, participating schools were randomized into the intervention or control group so that data collected at pre-intervention (baseline), post-intervention (end of 9th grade year), and at the one-year follow-up (in their 10th-grade year) could be analyzed for treatment effects. Data were compared from post-intervention and the one-year follow-up to fully understand the ACE treatment effects within the context of the overall intervention development described in Table 1. In the following discussion, this document refers to data collected at post-intervention as year 3, and data collected at the one-year follow-up as year 4.

The present study examined the one-year follow-up data from the ACE program to provide information about the follow-up effects of socio-emotional interventions for AP/pre-IBD students and if treatment effects remained, attuned, or emerged. Additionally, this longitudinal view provided two different aspects of the effects of the ACE program, including persistence in AP/pre-IBD classes and the percentage of 10th-grade students identified as needing additional social-emotional support due to signs of suboptimal grades, heightened stress, or low school satisfaction. This study involved secondary data analyses from a larger research project led by
Drs. Shannon Suldo and Elizabeth Shaunessy-Dedrick (a project carried out by a university-based research team that included this researcher) and was funded by the Institute of Education Sciences (IES; R305A100911; Suldo et al., 2021). The current study participants (N= 336) represented 61.4% of the full sample of students who participated in the year 3 study of the ACE program in 9th grade (N= 547).

This chapter will discuss the results of the follow-up analyses, integrate these findings with the post-intervention results from the year prior, explore where the follow-up assessment fits within the context of long-term SEL outcomes, and provide areas where further studies could illuminate different mechanisms of change. The current study helps build the literature base on the longitudinal effect on universal social-emotional interventions and start the conversation on what additional supports may be needed to maintain positive effects.

**One-Year Follow-Up Effects of ACE on Student Coping (Research Question 1)**

Specific factors associated with positive academic and socioemotional outcomes in AP/pre-IBD/IBD students include increased approach-problem-focused coping and low reliance on avoidance-alone coping (Suldo et al., 2018). To increase the likelihood that students experience these positive outcomes in rigorous classes, the ACE program aimed to have a lasting effect on students’ abilities to consistently use approach-problem-focused coping and reduce their utilization of avoidance-alone coping.

In order to answer Research Question 1 (i.e., "To what degree do the students in the treatment and control condition differ in their utilization of approach-problem-focused coping strategies and alone/avoidance coping strategies?") at the one-year follow-up, hierarchical linear modeling (HLM) was used to determine the significance and magnitude of intervention effects on coping strategies. Both coping factors of interest, approach-problem-focused (effective coping
strategies) and alone/avoidance (ineffective coping strategies), were analyzed for effects. Expanding each coping factor into its individual strategies provides information on how students utilize each one and does not mute these effects by averaging different coping strategies together into one factor. Overall, the HLM analysis at the one-year follow-up did not identify any coping strategies as statistically significant between the treatment and control groups; however, the effect size for each variable provides valuable information about the strength and direction of the relationship about the different coping strategies.

Regarding effect size interpretation, Kraft (2019) contends that using traditional Cohen's $d$ reference values to interpret effect sizes in preventative social-emotional interventions may not be appropriate. According to Kraft (2019), preventative social-emotional interventions are often designed to have small but meaningful effects on a range of outcomes that can be difficult to measure, such as attitudes, beliefs, and behaviors. Moreover, preventative interventions may target populations not yet experiencing significant problems or challenges, making it difficult to observe large effect sizes. Based on these considerations, Kraft (2019) suggests that researchers who interpret analyses for social-emotional interventions should consider using modified Cohen's $d$ reference values that are lower than those commonly used in other contexts. For example, Kraft (2019) recommends that the following effect size benchmarks be used for educational interventions on standardized student achievement: less than 0.05 is Small, 0.05 to less than 0.20 is Medium, and 0.20 or greater is Large. Using a modified interpretation that is more related to a specific class of studies captures the true impact of preventative interventions and supports a more nuanced interpretation of effect sizes more accurately in this field.
The approach-problem-focused coping strategies have been identified as malleable predictors of success in AP/pre-IBD students (Suldo et al., 2018), so positive effects are desirable. Of the approach-problem-focused coping styles, time and task management ($d=0.22$) and seek academic support ($d=0.22$) had the largest standardized effect sizes. While this effect may be considered small on Cohen's typical reference values, this impact is meaningful in the context of social-emotional research. At the one-year follow-up, students who received the ACE program reported using both time and task management and seek academic support at a higher rate than their peers who did not receive the intervention. Students may have continued to utilize time and task management because of the amount of content they received about time and task management, two modules (including how to prevent procrastination) compared to one module for the other approach/problem-focused coping strategies. Even though seek academic support only has one dedicated coping module, the higher use of this coping strategy may have resulted from secondary reinforcement from the engagement module that focused on increasing a student's network of support.

For the alone/avoidance coping strategies that are deemed ineffective and are associated with negative outcomes (Suldo et al., 2018), negative effect sizes are desirable. Substance use ($d=-0.15$) and sleep ($d=-0.19$) were the ineffective coping strategies with the largest effect sizes. Students who received the ACE program reported responding to academic stress by refraining from using substances and sleeping more than their peers who did not receive the intervention. It is possible that being instructed in the negative association with these behaviors in relation to their emotional and academic success provided another reason that helped them resist the temptation to engage in these behaviors. The effect sizes for the other four alone/avoidance-focused coping strategies were close to zero (effect sizes ranged between -0.06 to 0.07).
The analysis of coping conducted at the completion of the year 3 study (collected from both the treatment and control group in Spring 2018) was done using the broader categories of approach/problem-focused, avoidance, and alone. At the completion of the year 3 study (post-intervention), the approach/problem-focused was not statistically significant and had a standardized effect size of $d=0.16$. It is possible that the distribution of effect sizes, i.e., larger for time and task management and seek academic support, lower for the other four strategies, may have been present at the immediate completion of the intervention as well but not examined in favor of the focus on the larger construct. However, it is only partially discernable since the reported value represented an average value. The avoidance/alone coping strategies were not statistically significant at post-intervention, but they were in the desired direction (both $d=-0.15$).

Overall, these data may suggest that coping strategies with the most content/reinforcement have a longer shelf-life of positive effects than those not reinforced as often within the ACE program. This finding suggests that further direct instruction in ACE program targets after the completion of the full ACE program, termed follow-up sessions, focused on coping strategies may help AP/pre-IBD students utilize coping behaviors throughout their high school years. Further studies may want to assess if follow-up sessions should continue to teach the most used strategies- time and task management/ seek academic support- since they seem especially relevant to this population or focus on developing the other approach-problem-focused coping strategies so that students have more tools to draw on in times of stress.

**One Year Follow-Up Effects of ACE on Student Engagement (Research Question 2)**

Student engagement is another malleable factor that is associated with AP/pre-IBD/IBD students’ positive mental health and academic performance (Suldo et al., 2018). The ACE
program targeted student’s connectedness to different aspects of their school through affective engagement, behavioral engagement, cognitive engagement, and achievement motivation.

In order to answer Research Question 2 (i.e., "To what degree do the students in the treatment and control condition differ in their utilization of different aspects of engagement?") at the one-year follow-up, hierarchical linear modeling (HLM) was used to determine the statistical significance and magnitude of intervention effects on different aspects of engagement including affective, behavioral, cognitive, and achievement motivation.

Several aspects of engagement emerged as statistically significant between the treatment and control group at the one-year follow-up, including affective engagement- belongingness at school ($d=0.29$), as well as both aspects of behavior engagement- in class participation ($d=0.24$) and extracurricular activities ($d=0.23$).

Compared to the post-intervention data, the significant effects of affective engagement- belongingness at school and behavioral engagement- in-class participation remained and became larger at the follow-up assessment: Affective engagement- belongingness at school (post-intervention $d=0.23$ and follow-up assessment $d=0.29$), and behavioral engagement- in-class participation (post-intervention $d=0.19$ and follow-up assessment $d=0.24$). Behavioral engagement- extracurricular activities, which was not significant at post-intervention ($d=-.04$, $p=.64$) emerged as significant at the one-year follow-up. Since students in 9th grade learned about the benefits of ECA’s later in the fall semester, the knowledge students gained from the ACE program about the benefits of ECA's may have been put into practice in 10th grade since most connections with school activities happen at the beginning of the year. The post-intervention significant effects of affective- in class positive emotions ($d=0.26$, $p<.05$) and achievement motivation- value school ($d=0.27$, $p<.05$) were not significant at the one-year follow-up.
The three aspects of engagement that remained and emerged as significant at the one-year follow-up all relate to the participation and connection to the school, as opposed to the feelings about schoolwork and its future benefit. This finding suggests that targeting engagement with the school itself instead of a broader connection between the school and its facilitation of future life goals is more salient to AP/pre-IBD students. School-specific variables outside of the ACE program play a role in this connection, including school culture, school spirit cultivation, and activities offered to students. Previous research supports the positive effect between school connections and beneficial student outcomes (Kiuru et al., 2020; Zhoc et al., 2020). The ACE program may be an intervention that schools can use to foster more school connection with the AP/pre-IBD students that is likely to persist over time.

It should be noted that only affective engagement-belongingness at school was affected by differential attrition effects. For this variable, the participants who did not participate in the current study were not random; there was an identifiable pattern for those who did and did not participate. The interpretation of this finding should be considered within the context of the differential attrition effect explained in Chapter Four.

**One-Year Follow-Up Effects of ACE on Eustress (Research Question 3)**

Eustress, a positive stress response, is an intervention target with significant positive relationships with several facilitative constructs, including coping, engagement, self-efficacy, flow, and grit, and negative relationships with undesirable factors, including distress and emotion-focused coping (Moseley, 2018). Eustress also significantly predicted higher student success in AP/pre-IBD/IBD students (Moseley, 2018).

In order to answer Research Question 3 (i.e., "To what degree do the students in the treatment and control condition differ in their levels of Eustress?") at the one-year follow-up,
hierarchical linear modeling (HLM) was used to determine the significance and magnitude of the intervention effect on eustress. Eustress emerged as a significant factor at post-intervention ($d=0.23$). It not only remained significant but increased at the one-year follow-up assessment ($d=0.38$). This finding is consistent with previous research by van Loon (2020) that found effect sizes for stress-management interventions increased at follow-up assessments. Students in the ACE program who were taught to view stress as positive and motivating (eustress) rather than distressing continued to apply this mindset through the end of 10th grade. This effect would suggest that eustress is a salient concept to AP/pre-IBD students since this mindset not only persisted but flourished with time. This significant treatment effect also signifies that eustress is not routinely incorporated into AP/pre-IBD classes, even though these students experience high-stress levels (Suldo et al., 2013). Since stress is so prevalent among student enrolled in AP/pre-IBD classes, this mindset of viewing stress as motivating (eustress) is an essential component of the ACE program that would be beneficial to incorporate in these rigorous classes routinely.

**One-Year Follow-Up Effects of ACE on Mental Health Outcomes (Research Question 4)**

Positive mental health has become a separate yet equally important indicator of positive academic outcomes for students, especially adolescents (Hoover et al., 2019; Roeser et al., 2000; Zins, 2004), making this an important treatment outcome to examine. The analyses examined both the positive indicators (Subjective well-being [positive affect and life satisfaction]) and the negative indicators (Psychopathology [internalizing problems and externalizing problems] and academic burnout) of mental health.

In order to answer Research Question 4, (i.e., "To what degree do the students in the treatment and control condition differ in mental health outcomes?") at the one-year follow-up, hierarchical linear modeling (HLM) was used to determine the significance and magnitude of the
intervention effects on subjective well-being (positive affect and life satisfaction), and negative indicators of mental health (internalizing problems and externalizing problems; and academic burnout).

For the mental health outcomes in 10th grade, analyses revealed that students in the treatment condition reported significantly lower externalizing problems than the control group ($d=-0.25$). At post-intervention, externalizing problems were non-significant ($d=-0.08$) an effect that aligns with Greenberg and Abenavoli’s (2017) hypothesis of delayed prevention effects appearing in follow-up assessments. Lower externalizing problems can be significant for students because adverse outcomes such as class removal, suspension, and discipline records are associated more frequently with externalizing problems than internalizing problems (Modecki et al., 2017).

Of the other mental health variables, positive affect, life satisfaction ($d = .05$ and $d = .08$, respectively) and academic burnout ($d=-0.02$) had effect sizes that were not significant but in the expected directions, whereas the non-significant effect of internalizing problems was in the inverse direction as expected but close to zero ($d=0.01$). Academic burnout was a significant effect at post-intervention ($d=-0.29$) that attenuated at one-year follow-up ($d=-0.02$). Further, differential attrition also affected academic burnout, where students with higher academic burnout scores at the start of 9th grade participated significantly less in the current study at the end of 10th grade than their counterparts who reported lower burnout levels at the start of 9th grade. It is possible that since more students in the treatment group participated in rigorous classes, they felt more burnout than their peers in less rigorous classes. However, this variable should be interpreted cautiously due to the attrition finding.
One-Year Follow-Up Effects of ACE on Academic Outcomes (Research Question 5a & 5b)

One of the most salient aspects of success for students is desirable academic outcomes, such as high GPA and test scores. While the ACE program does not target any academic skills directly, it is well-documented that a relationship exists between positive socioemotional functioning and favorable academic outcomes (Durlak et al., 2011; Gueldner et al., 2020; Klem & Connell, 2004; Sklad et al., 2012; Taylor et al., 2017).

In order to answer Research Questions 5a and 5b (i.e., "To what degree do the students in the treatment and control condition differ in academic outcomes including GPA and AP exam scores?") at the one-year follow-up, hierarchical linear modeling (HLM) was used to determine the significance and magnitude of intervention effects on these academic outcomes. No variable emerged as significant for the academic outcomes at the one-year follow-up assessment.

Regarding GPA, the effect size for 10th-grade GPA ($d=-0.15$) was not in the desired direction. This finding was consistent with the results at post-intervention for 9th grade GPA ($d=-0.07$). However, in 10th grade, students in the treatment condition did not receive any active intervention components (i.e., class-wide or individual meetings), so the negative effect at the follow-up assessment is not due to possible additional loss of instructional time to make way for SEL programming (i.e., the ACE program modules). Even though the effect of the 10th grade GPA variable was not in the desired direction, students in both the treatment group and the control group reported an above average GPA (treatment group mean GPA: 3.42, control group mean GPA: 3.46).

The 10th-grade unweighted GPA incorporates all classes a student takes without differentiating between higher and lower-level classes. As noted above in Chapter Four, significantly more students in the treatment group continued to participate in rigorous
curriculum. High grades are harder to earn in AP/pre-IBD classes than in general education classes, so it is possible that students who received the ACE program persisted in these rigorous classes and did not earn as high grades as those students in general education classes. The connection between positive socioemotional functioning and better academic outcomes is well-documented in the literature (Hoover et al., 2019; Masten & Cicchetti, 2010). Therefore, further research is warranted to explore other factors or metrics that link socioemotional functioning and GPA in AP/pre-IBD students.

The variable specific to student performance on college-level tests, namely the AP exams, had a non-significant but positive effect size at one-year follow-up \( (d=0.10) \). This variable changed from a negative non-significant effect \( (d=-0.38) \) at the post-intervention to a non-significant positive effect at the one-year follow-up assessment \( (d=0.10) \). While the one-year follow-up effect was not statistically significant, it is worth noting that the treatment effect changed from a negative effect to a positive effect; it is unknown if the effect might continue to improve at subsequent follow-up points. The post-intervention AP exam variable only compared the performance of the treatment and control group on a single AP exam, Human Geography, instead of the 10th-grade variable, which consisted of an average of the various AP exams students took. Students in 9th grade are generally limited to one AP class, whereas 10th-grade students have more class options.

Several possibilities could explain the directional shift in the AP exam effect size from 9th to 10th grade. First, 9th-grade students have never taken an AP exam, so there may be a learning curve to preparing for and taking a comprehensive exam. Second, the average AP exam score variable likely balances out more specific causes of exam performance, such as teacher quality and difficulty of the AP exam that is challenging to account for in a single-exam variable.
Exam performance in 9th grade may be heavily influenced by a single teacher effect, whereas exam performance in 10th grade reflects performance in classes taught by multiple instructors of the multiple AP classes available to 10th grade students.

One-Year Follow-Up Effects of ACE on Continued Participation in AP classes/Pre-IBD Program (Research Question 5c)

While many factors play into a student's continued pursuit of rigorous classes, students with the tools to cope with the stressors inherent to accelerated curricula may be more likely to persist. This additional indicator of the ACE program's effectiveness is unique to the one-year follow-up data.

Self-report data from students were used to group participants into current participation (taking at least one AP class or enrolled in the pre-IBD program) or non-participation (not enrolled in either AP or pre-IBD classes). At the one-year follow-up assessment, significantly more students in the treatment group continued in rigorous classes (87.68%) than their control group counterparts (75.71%).

Continuation in rigorous curricula provides many tangible and intangible benefits to students, including increased college acceptance, reduced college tuition, persistence in college for at least two years, and increased readiness and preparation for postsecondary education (Callahan & Caughey, 2020; Coca et al., 2012; Grose & Sanchez, 2021). Prior research indicates that students who participated in advanced coursework reported feeling prepared for the postsecondary course content and having positive behavioral habits such as organization, time management, and motivation to succeed (Coca et al., 2012; Grose & Sanchez, 2021). However, students who prematurely drop out of the AP or IB programs cite high levels of stress and fatigue, the time-consuming workload, and the perceived expectation that students should be able
to manage the academic material without extra support as reasons for not continuing with advanced level classes (Foust et al., 2009; Hertberg-Davis & Callahan, 2008). These hurdles especially impact the participation of non-white and low-income students from persisting in these advanced-level classes (Perna et al., 2011).

There is no collective database that actively tracks the retention of students in rigorous curricula and retention rates for these programs can vary based on several factors including the school, region, and individual circumstances. However, one outcome in the High School Longitudinal Study of 2009 (HSLS:09; Dalton et al., 2018) which tracked 20,000 ninth graders from fall 2009 to high school graduation in 2013, assessed the average number of AP/IB credits (one-year classes) earned by these students. For the total sample, 36.7% of the students earned at least one AP/IB credit, with the average amount of AP/IB credits being 3.2. However, there was a large racial difference in the distribution of credits earned. For Asian students, 72.3% of students earned at least one AP/IB credit, compared to 23.1% of Black students, 33.6% of Hispanic/Latino students, and 39.8% of White students (Dalton et al., 2018).

The finding that students who took part in the ACE program during their freshman year persisted in rigorous curricula significantly more than their control group peers who did receive such universal supports suggests that the different targets and components of the ACE program help remediate some of the challenges these students face. Educational stakeholders who help remediate these barriers to retention in rigorous curricula, such as through the ACE program, may help increase diversity in their advanced-level classes and maximize the chances that students receive the full benefits of the AP or IB programs.
Need for Tier 2 Support for AP/Pre-IBD Students at One-Year Follow-Up (Research Question 6)

Using the Multi-Tiered Systems of Support (MTSS) in schools allows for effective and efficient distribution of resources (Schiller et al., 2020; Stoiber & Gettinger, 2015). To this end, MTSS focuses on prevention and proposes that 80% of students should be supported by Tier 1 universal instruction. The number of students that need selective intervention (Tier 2) should be approximately 20%, while only 5% should need the highest level of support (Tier 3). The ACE program focuses on prevention and includes Tier 1 support for all students and Tier 2 support for students with academic or emotional risk. Based on criteria from Suldo et al. (2019), students qualified for Tier 2 support if they demonstrated at least one academic or emotional risk factor. AP/pre-IBD students were identified as academically at-risk if they had a GPA lower than 3.0 and emotionally at-risk if they reported high perceived stress or low levels of school satisfaction.

The chi-squared analysis showed no significant difference between the treatment and the control group in the qualification for Tier 2 support. However, while Tier 2 support should incorporate approximately 20% of the population (Stoiber & Gettinger, 2015), this study reports that 49% of the treatment group and 56% of the control group had at least one risk factor that would indicate the need for further support. These percentages suggest that continued support for AP/pre-IBD students is necessary at the Tier 1 and Tier 2 level to address these academic and emotional risk factors before the level of impact increases.

Summary of One-Year Follow-Up Findings

This study investigated the one-year impact of the ACE program on student outcomes. Results from the one-year follow-up assessment found significant differences between the treatment and control group on affective engagement (belongingness at school; $d = 0.29$),
behavioral engagement (in-class participation; $d=0.24$), behavioral engagement (extracurricular activities; $d=0.23$), eustress ($d=0.38$), and externalizing problems ($d=-0.25$). The treatment effects that remained significant from post-intervention to one-year follow-up included affective engagement (belongingness at school), behavioral engagement (in-class participation), and eustress. Behavioral engagement (extracurricular activities) and externalizing problems were not significant at post-intervention but emerged as treatment effects in 10th grade. Significant treatment effects at post-intervention for affective engagement (in-class positive emotions), achievement motivation (value school), and academic burnout attenuated to non-significance at the one-year follow-up. Two additional indicators of the ACE program’s effectiveness revealed that significantly more students who received the ACE program continued participating in AP/pre-IBD classes in 10th grade than their control group counterparts. However, a decent percentage of students in the treatment group (49%) and the control group (56%) demonstrate the need for additional support.

**Study Limitations**

Several limitations should be considered when interpreting the findings from this study. First, only 61.4% of the year 3 sample participated in the follow-up assessment. While the researchers invited participants at every school from the year 3 study, it was challenging to enroll 10th-grade students due to varying levels of school-level investment. For example, at some schools, administrators assisted the study staff and nearly all participants were enrolled, whereas at other schools relatively few students experienced such encouragement from school staff. Other challenges for the research staff that were responsible for enrolling students included the diversity in student schedules and the lack of a common class taken by all previous study participants. Schools that supported recruitment by having teachers or counselors recruit students
had a higher participation rate than the schools where the researchers made the only recruitment effort. With only two-thirds of the year 3 sample participating in the follow-up assessment, there could be systematic differences in those students who did and did not participate. The attrition analysis aimed to evaluate this limitation by determining whether the current sample was representative of the original sample on baseline variables. Out of the 26 study variables examined for attrition, only five emerged as being impacted by differential attrition, so more caution is warranted when interpreting these variables.

Second, the broad purpose of this study was to provide the first look at any longitudinal effects of the ACE program. However, more than a one-time follow-up measurement may be required to capture the actual effects of an intervention, especially if the outcome of interest changes over time. Longitudinal data collection allows for tracking changes in variables over time, which can provide a more comprehensive understanding of the impact of an intervention. Without data at multiple points in time, it may be difficult to draw valid conclusions about the long-term effects of the intervention. Data collection throughout high school is significant for pre-IBD students, as they start the official IBD program in 11th grade. The principal investigators of this project planned a multiyear follow-up, but due to the COVID-19 pandemic effects on schools, the data collection after 10th grade was impossible. While this study provides insight into intervention effects one-year later, more is needed to assess the longitudinal effects of the ACE program fully. To prevent recruitment roadblocks experienced by the current study, additional studies of the longitudinal effects of the ACE program should consider including a multiyear follow-up consent in the original consent form.

Lastly, no data were gathered about school-level interventions for AP/pre-IBD students in the year gap between post-intervention and follow-up. The absence of information about the
interventions implemented by schools during the gap between post-intervention and follow-up can limit the interpretation of the results. Certain schools may have provided additional support to AP/pre-IBD students in that interim period, so the observed effects of the intervention in part could be due to other interventions or supports besides the ACE program.

**Implications for School Psychology Practice**

Several key points from the current study apply to practitioners and educational staff working with AP/pre-IBD youth. First, data from the one-year follow-up provide preliminary support that the ACE program as an intervention that teaches novel concepts to students and has lasting treatment effects. As evidenced by the differences in skills between the treatment and control groups, students who received the ACE program are applying these beneficial practices more frequently than students who do not receive the ACE program.

Previous research documented that AP/pre-IBD students have significantly higher levels of stress than their typical high school peers (Suldo & Shaunessy-Dedrick, 2013a, 2013b; Suldo et al., 2015; Suldo et al., 2018). With the additional burden the pandemic imposed on youth mental health (Reinert, Fritze, & Nguyen, 2021), it is even more critical to have the correct tools to support positive socioemotional functioning in youth who are in a stressful academic environment. School support staff should consider using the ACE program as a resource for students in all high school grades who are in rigorous curricula.

As evidenced from the current study data, nearly half the students in each treatment condition are experiencing at least one academic or emotional risk factor in 10th grade (treatment group- 49%, control group- 56%). While positive treatment effects remained in 10th grade, there are still areas for continued support. The entire ACE program (Tier 1 and 2 components) could be implemented in 9th grade, and additional follow-up sessions could be provided to small or
large groups of students as needed. As evidenced by Top et al. (2016), which measured the effects of a socioemotional curriculum in middle school, the positive effects of the intervention remained in students where skills were reinforced over time.

Second, results from the one-year follow-up indicated that significantly more students in the treatment group continued participating in AP/pre-IBD classes in 10th grade than in the control group (88% versus 76%). Students who persist through rigorous curriculum may receive post-secondary benefits (Callahan & Caughey, 2020). With consistent student enrollment in these classes throughout high school (and not just 9th grade), schools can continue supporting the teachers and curriculum needed for these programs. Assimilation into the academic environment strongly predicts continued education in rigorous academic settings (Kerby, 2015). The significant effects at the one-year follow-up for behavioral and affective engagement in the treatment group may indicate academic assimilation, contributing to the continued pursuit of AP/pre-IBD classes. If this assimilation is established in 9th grade, the integration and engagement of the students with the school, staff, and AP/pre-IBD program may be self-reinforced (with less need for formal intervention) by the ongoing participation in clubs and class experiences. Providing socioemotional support to AP/pre-IBD students may build their ability to persist through challenging curriculum, so school personnel who invest in prevention efforts set these students up for long-term success.

Lastly, eustress demonstrated the largest significant treatment effect at the one-year follow-up. Eustress is a positive stress response that manifests behaviorally as engagement, motivation, and feeling challenged (Nelson & Simmons, 2011). Since AP/pre-IBD students will have to manage stress, learning and utilizing eustress provides a beneficial alternative to distress, a negative stress response that can result in feeling overwhelmed or uncomfortable physical
symptoms. Previous research supports that the effects of stress-reduction interventions not only last but increase over time (van Loon et al., 2020). School personnel should be aware of eustress and can focus on building this skill when working with students referred for negative stress responses.

To generate eustress, school personnel can have students identify which aspects of their AP/pre-IBD classes are most engaging and why they feel motivated and challenged by this aspect (Hargrove et al., 2013). Then, both parties can work together to design ways to focus on and enhance those positive aspects in all classes. A second way to generate eustress focuses on relating stressors to task accomplishment or personal development (Hargrove et al., 2013). School personnel can use the ACE program's strengths, values, and goals module (Module 12) to have students identify their character strengths and life goals. Practitioners can then use this information to relate how overcoming the identified academic challenges promotes a life goal or aligns with an identified character strength. Third, practitioners must encourage students to savor their successful experiences. Savoring is defined as "how well people attend to, appreciate, and enhance positive experiences in their lives" (Bryant & Veroff, 2007, p. 2). Students who savor their eustress experience can increase positive emotions and use this experience to encourage utilizing it in response to stressors.

Implications for Research

Few socioemotional intervention studies currently include follow-up assessments that track intervention effects over time (van Loon et al., 2020). This study is the first longitudinal view of a socioemotional intervention specific to high school students in rigorous curriculum. Results from this study show that three significant treatment effects at post-intervention remained significant and increased in effect size one-year post-intervention without additional
intervention. While three treatment effects attenuated from post-intervention to follow-up, two additional effects emerged as significant at the one-year follow-up.

Seeing that many significant effects remained from post-intervention to follow-up suggests that including follow-up assessment in an intervention evaluation helps reveal the effects that become engrained within participants. Knowing this information can lead researchers to investigate the commonality and mechanisms of change for these persistent effects, which can then be applied to bolster the success of other effects. Follow-up assessments also provide additional data sources to measure treatment efficacy. In the current study, positive treatment effects on continued participation in AP/pre-IBD classes are a salient indicator for agencies that approve and enact socioemotional programs. Other studies that employ follow-up assessments may find different indicators of treatment effects not available at post-intervention that are persuasive to stakeholders who determine intervention dissemination. However, more longitudinal information is needed to provide a complete picture of intervention effects over time. More conclusive data would be gained from a multiyear longitudinal assessment that follows a cohort of students over time and models their growth trajectory. Future studies of the ACE program would benefit from a multiyear follow-up assessment and an increased number of school programs to increase statistical power in detecting intervention effects.

In addition, future studies should investigate the connection between the ACE program and academic outcomes. It is well-established in research that SEL interventions demonstrate significantly improved academic performance (Durlak et al., 2011); however, both results from the post-intervention and follow-up assessment found a non-significant negative intervention effect on unweighted GPA. No other socioemotional interventions have assessed academic outcomes for students in rigorous curriculum. Due to the high level of content and rapid pace of
instruction and assignments in these classes, additional factors may contribute to this negative relationship. Academic outcomes are an essential indicator of student success, so it would be beneficial for researchers to understand the relationship between the ACE program and academic outcomes. This discussion may include investigating another indicator of academic outcomes besides GPA. GPA is the ubiquitous measure of academic success, making it easily accessible to researchers. However, unweighted GPA is a broad measure that includes all classes a student takes, including AP or pre-IBD classes, general education classes, and electives. Finding an indicator that comprehensively assesses a student’s academic abilities in rigorous classes may help refine this concept.

Lastly, researchers should conduct future studies that relate to the expansion, accessibility, and cost of the ACE program. Besides AP and IBD, additional rigorous curriculum options include the Cambridge Advanced International Certificate of Education [AICE] Program and dual enrollment (where high school students take postsecondary coursework). It is reasonable that these students would also benefit from the ACE program since it targets skills beneficial to succeeding in rigorous classes. Expanding the program to these different groups would allow more targeted interventions for these students, which is more beneficial than generic interventions that do not consider the academic stress they experience. To increase the accessibility of the ACE program, future studies could look to implement different configurations of the ACE program that target the specific skills students lack and assess if intervention effects persist if only certain aspects of the program are used. Targets of the ACE program may align with effective learning strategies from the science of learning literature, i.e., time and task management and distributed practices, so further investigation of this connection
may help researchers align ACE behavioral recommendations with evidence-based learning recommendations.

It is also important to evaluate the real-world resources needed for intervention implementation. Time is one of the most valuable resources in the school setting, so targeting relevant skills might incentive educators to support socioemotional functioning for all students. The ACE program is modular and amenable to a more flexible and targeted approach. Cost is also another important factor that determines the viability of an intervention program. Future studies should also assess the cost, i.e., materials, time needed for implementation from school personnel, time allotted within the school day for content delivery, of implementing the ACE program so that schools know what resources are needed for successful intervention delivery.

Conclusion

Since taking a holistic view of youth, supporting students' socioemotional and academic functioning is a priority for schools. Schools adhere to the Multi-Tiered Systems of Support (MTSS) principles to properly support this initiative with the resources available by implementing evidence-based practices with incremental intensity (Stoiber & Gettinger, 2015). Students in accelerated curricula in high school, specifically taking AP classes or pursuing the IBDP, demonstrated elevated stress levels compared to their general education peers (Suldo & Shaunessy-Dedrick, 2013a, 2013b; Suldo et al., 2015; Suldo et al., 2018).

However, before the ACE program, no socioemotional interventions existed that targeted the specific factors of success related to success in these rigorous curricula. To fill this gap, with funding from IES a team of researchers in the USF College of Education (Drs. Suldo, Shaunessy-Dedrick, Ferron, and Dedrick) developed and iteratively tested the ACE program. The ACE program targets 9th-grade AP and pre-IBDP students and consists of four universal
components for students, parents, and teachers and one selective component for students with
signs of academic or emotional risk (Shaunessy-Dedrick et al., 2022).

A randomized control trial of the ACE program was conducted during the 2017-2018
school year with 547 9th-grade AP and pre-IBDP students in 14 schools (15 AP/IB school
programs). Researchers gathered academic and self-report social-emotional data from students'
pre-and-post intervention on ACE program targets (coping, engagement, eustress) and student
outcomes (academic and mental health). Post-intervention results showed promising coping,
engagement, eustress, and mental health outcomes among students in AP and pre-IBDP
programs randomized to the intervention condition compared to students in the control condition
(Ferron et al., 2021; Suldo et al., 2022).

The current study analyzed archival data from the one-year follow-up assessment
conducted during the 2018-2019 school year. At one-year post-intervention, 336 (61.4%)
previous study participants provided data. Results from the one-year follow-up assessment found
significant ($p<.05$) lasting treatment effects on affective engagement (belongingness at
school; $d=0.29$), behavioral engagement (in-class participation; $d=0.24$), behavioral engagement
(extracurricular activities; $d=0.23$), eustress ($d=0.38$), and externalizing problems ($d=-0.25$).
Eustress represented the most prominent effect size at the one-year follow-up, which increased in
value from post-intervention.

The treatment effects that retained significance from post-intervention to follow-up
included affective engagement (belongingness at school), behavioral engagement (in-class
participation), and eustress. Two significant effects emerged post-intervention: Behavioral
engagement (extracurricular activities) and externalizing problems. A few significant effects at
post-intervention attenuated to non-significance at the one-year follow-up, including affective
engagement (in-class positive emotions), achievement motivation (value school), and academic burnout. Examinations of two additional indicators of the ACE program's effectiveness revealed that significantly more students who received the ACE program continued participating in AP/pre-IBD classes in 10th grade than their control group counterparts (88% compared to 76%). However, a sizeable percentage of students in the treatment group (49%) and the control group (56%) demonstrate the need for additional support.

This study provides longitudinal information about how the treatment effects from the ACE program fare one year after completion of the intervention. The trajectory of the effectiveness of the ACE program provides valuable information to educational stakeholders on how to best support AP/pre-IB students in their academic endeavors. Researchers can also use this study, along with other intervention follow-up studies, to expand the research base on long-term follow-up effects on socioemotional interventions.
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https://doi.org/10.1007/s10212-019-00458-0

APPENDICES
Appendix A: IRB Approval Letter

7/2/2018

Shannon Suldo, Ph.D.
Educational and Psychological Studies
4202 East Fowler Ave., EDU 105
Tampa, FL 33620

RE: Expedited Approval for Continuing Review
IRB#: CR3_Pro00022787
Title: Facilitating Academic Success and Emotional Well-Being Among High School Students in Accelerated Curricula

Study Approval Period: 7/14/2018 to 7/14/2019

Dear Dr. Suldo:

On 6/28/2018, the Institutional Review Board (IRB) reviewed and APPROVED the above application and all documents contained within including those outlined below.

Approved Item(s):
Protocol Document(s):
Narrative Protocol Version 6 No track changes.docx

Consent/Assent Document(s)*:
Administrator Consent Year 3 V1_7.5.17.docx.pdf
Administrator Consent Year 3 V1_7.5.17.docx.pdf
Administrator Consent Year 3 V1_7.5.17.docx.pdf
Administrator Participation Year 2.pdf
Honors College Student Participation Year 2.pdf
Honors Student Consent Year 1 Student Focus Groups_FINAL.pdf
Honors Student Consent Year 1 Student Focus Groups V2 1-15-16 CLEAN.pdf.pdf
Parent Consent for Student Participation in Evaluation and Screening Year 3 V1_7.5.17.docx.pdf
Parent Consent for Student Participation in Extra Support Year 3 V1_7.5.17.docx.pdf
Parent Consent for Student Participation Year 2.pdf
Parent Consent for student participation Year 3 V1_7.5.17.docx.pdf
The IRB determined that your study qualified for expedited review based on federal expedited category number(s):

(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.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with USF HRPP policies and procedures and as approved by the USF IRB. Any
changes to the approved research must be submitted to the IRB for review and approval by an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

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 813-974-5638.

Sincerely,

Kristen Salomon, Ph.D., Chairperson
USF Institutional Review Board
Appendix B: Recruitment Script

Recruiting Students for Follow-Up Study Participation

Background information: USF research staff will share (in advance) with the AP/IB classroom teacher and/or school administrator, in a meeting scheduled to occur outside of instructional time and/or via email:

- The Advancing Coping and Engagement (ACE) program is a classroom-based curriculum designed to teach AP and IB students evidence-based strategies for managing stress tied to their rigorous courses. This program is intended to improve students’ emotional well-being and academic outcomes.

- Schools that participated in an evaluation of ACE during the 2017-18 school year were randomly assigned to one of two groups: intervention and control. Schools randomly selected to take part in the intervention received support through USF to deliver the ACE program to select classes of 9th grade AP/IB students. In the second half of the school year, intervention schools offered additional support to students who show signs of challenges with managing their academic demands. Schools randomly placed into the control group will receive the ACE program training and intervention materials for use with freshmen during the 2018-19 school year.

- Your school is implementing ACE as part of a schoolwide initiative to enhance 9th grade students’ ability to cope with the rigorous demands of their advanced curricula, as well as improve their school engagement. This modularized program is part of normal school activities.

- We are recruiting students who participated in an evaluation of the effectiveness of ACE on 9th grade students’ outcomes to participate in a follow-up study. This follow-up study is being conducted to examine long-term effects of ACE on student outcomes during 10th, 11th, and 12th grade. We will ask students to take part by completing surveys up to two times a year (end of 1st and 2nd semesters) during 10th, 11th, and 12th grades. Survey completion is expected to take about 45 minutes on each occasion. We will administer the surveys outside of instructional time to students in your class who have parent permission and student assent to participate.

- I have provided a list of students, for whom parent consent and student assent to participate in the evaluation of ACE during 9th grade have been obtained previously. Please tell me when I can meet with students whose names are specified on the list in that brief meeting.I will read aloud the script below, in order to recruit students for participation in this program evaluation study of long-term effects of ACE. I will make clear that participation by students is completely voluntary; their decision to participate (or not) should not impact their grades or their relationship with USF, you, or anyone at their current school. We will not use any coercion or undue influence to recruit participants. This study’s procedures have been approved by USF IRB (2017-0020).

- I will distribute two copies of the parent consent/permission form to students specified on the list. Please let me know when I can stop by to pick-up returned forms, and provide student with additional copies of the parent consent form as needed (in the event the form is misplaced, lost, etc.).

What USF research staff will say to students:

Hello, I am [name], a researcher from the University of South Florida. We are conducting a follow-up study to evaluate the long-term effects of the Advancing Coping and Engagement (ACE) program. ACE is a classroom-based curriculum designed to teach freshmen in Advanced Placement courses or the International Baccalaureate program evidence-based strategies for managing stress tied to their rigorous courses. You are being asked to participate in the research study that is being conducted to evaluate the effects of the ACE program on student academic and emotional well-being when students are in 10th grade and beyond. You are being asked to participate in this follow-up study because during the 2017-2018 school year, you took part in the evaluation of ACE on student academic and emotional well-being during 9th grade. Participation in this study is voluntary; it is your choice whether or not you want to participate. Each year in grades 10, 11, and 12, you will be asked to complete a packet of surveys asking you questions about your academic demands and emotional well-being during the fall and spring semesters. Only students with written parent permission can participate in the follow-up study, so please bring these consent forms home to your parents or guardians. Your parent should keep the blue copy for the family’s records, and complete the pink copy. Please return the completed pink copy to your teacher or Assistant Principal as soon as possible, whether or not your parent chooses to allow you to participate. We are collecting signed permission forms that will allow students to take part, as well as collecting forms on which parents have indicated that they do not want their child to take part.

Thank you!

Shannon Sulte, Ph.D.
School Psychology Program
813-974-2223 or eds@usf.edu

Elizabeth Suenesz-Dedrick, Ph.D.
Gifted Education Program
813-974-7007 or shoeves@usf.edu
Appendix C: Mailed Recruitment Script

Invitation to Participate in a Follow-Up Study

Dear Parent/Guardian,

We are researchers from the University of South Florida. We are conducting a follow-up study to evaluate the long-term effects of the Advancing Coping and Engagement (ACE) program. ACE is a classroom-based curriculum designed to teach freshmen in Advanced Placement courses or the International Baccalaureate program evidence-based strategies for managing stress tied to their rigorous courses. During the 2017-2018 school year, your child participated in the evaluation of ACE on student academic and emotional well-being during 9th grade in either their AP Human Geography or IB Inquiry Skills class.

We are asking your child to participate in the research study that is being conducted to evaluate the effects of the ACE program on student academic and emotional well-being when students are in 10th grade and beyond. Participation in this study is voluntary: it is your choice whether or not you want your child to participate. Your child’s participation involves completing a packet of surveys asking them questions about their academic demands and emotional well-being in their current school year (10th, 11th, or 12th grade). Survey completion is expected to take about 45 minutes on each occasion. Only students with written parent permission can participate in the follow-up study. We will administer the surveys outside of instructional time to students who have parent permission and student assent to participate. This study’s procedures have been approved by USF (IRB #22787). This research is considered to be minimal risk, which means that the risks associated with this study are the same as what your child faces every day. However, your child will receive no personal benefits by participating in this research study.

We are collecting signed permission forms that will allow students to take part, as well as collecting forms on which parents have indicated that they do not want their child to take part.

Please take the following steps:
- Review the front and back of the pink/blue consent form, and sign both copies.
- Keep the signed blue copy for your records.
- Mail the signed pink copy in the postage pre-paid and addressed envelope.

Thank you!

Shannon Suldo, Ph.D.
School Psychology Program
813-974-2223 or suldo@usf.edu

Elizabeth Shaunessy-Dedrick, Ph.D.
Gifted Education Program
813-974-7007 or shaunessy@usf.edu
Appendix D: Parent Consent Form

Dear Parent or Guardian:

This letter tells you about a research study that will be done at your child’s school by professors and graduate students from the University of South Florida (USF). Our goal in doing the study is to evaluate the long-term effects of the Advancing Coping and Engagement (ACE) program. The ACE program is a classroom curriculum designed to teach freshmen evidence-based strategies for managing stress from their rigorous courses. The ACE program is intended to improve emotional well-being and academic outcomes among students in Advanced Placement (AP) or International Baccalaureate (IB) courses.

✓ **Who We Are:** We are USF Professors Shannon Suldo and Elizabeth Shuanssey-Dedrick. Our research team includes graduate students, school psychologists, and other professors in the USF College of Education. We are doing the study in cooperation with district and school administrators to ensure the study provides information that will be helpful to students, teachers, families, and administrators.

✓ **Why We are Requesting Your Child’s Participation:** This study is part of a project entitled, “Supporting High School Students in College-Level Classes.” Your child is being asked to participate because in the 2017-18 school year, he or she was in an AP or IB class, and participated in an evaluation of the ACE program on 9th grade student outcomes.

✓ **Why Your Child Should Participate:** Schools need evidence-based programs to help high school students navigate the academic rigor of college-level courses. To address this need we are evaluating the ACE program. The ACE program was developed to build AP and IB students’ coping skills and strong connections to their school. You have previously provided permission for your child to take part in an evaluation of the ACE program on students’ emotional and academic well-being during their 9th grade year. We are conducting this follow-up evaluation to determine the program’s impact on students’ emotional and academic well-being as they progress through high school. Such information helps ensure educators select programs with evidence of promise on student outcomes. Neither you nor your child will be paid for your child’s participation in the study. However, all students who participate by completing a packet of surveys on personal well-being will receive a $10 gift card on each occasion.

✓ **What Participation Requires:** Students who have parent permission to participate in this follow-up evaluation of the ACE program will be asked to complete a packet of surveys with questions about their ways of coping with academic stress, feelings about school, and emotional well-being (happiness as well as symptoms of emotional or behavioral problems). Survey packets will be given near the end of the fall and spring semesters of students’ 10th, 11th, and 12th grade years. Completion of the survey packet is estimated to take about 45 minutes on each occasion. All activities will be during regular school hours and scheduled to be minimally disruptive to your child’s academic schedule. In total, participation will take no more than 2 hours for students during the 2018-19 school year, no more than 1 hour for students during the 2019-20 school year, and no more than 2 hours for students during the 2020-21 school year. Participation also involves a confidential review of your child’s school records specific to academic performance during the 2018-19, 2019-20, and 2020-21 school years. School/district employees will provide the USF team with your child’s achievement and in-school behavior (attendance and discipline history, number of office referrals, course enrollment and performance grades earned in each course, and scores on end-of-course AP and IB exams).

✓ **Confidentiality of Your Child’s Responses:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what your child faces every day. There are no known additional risks to those who take part in this study. Your child will receive no benefits by participating in this research study. 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 we will not share your child’s individual responses with school system personnel or anyone other than us and our research assistants. Your child’s responses 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 all records linking code numbers to participants’ names. All records from the study will be destroyed in five years. Your child’s specific responses will not be shared with school staff. However, if your child indicates that he or she intends to harm him or herself or someone else, or if your child’s responses on surveys indicate extreme emotional distress, we will contact
ment health staff. Those individuals will follow district procedures for ensuring the safety of your child and others and following-up with parents and guardians about concerns for student well-being.

☑ **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 research study or to withdraw him or her at any time. Your child has the right to withdraw his/her assent or discontinue participation at any time without penalty. Any 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 high school, school district, USF, or any other party. Your child does not have to participate in any part of this research. You or your child have the right to inspect the survey instruments before they are administered, if a request is made within a reasonable amount of time. The surveys and directions for administering them will be available at your school prior to the survey administration.

☑ **What We’ll Do With Your Child’s Responses:** We plan to use the information from students to determine the effectiveness of an intervention intended to support AP and IB students. Results from data collected during 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 us at (813) 974-2223 (Dr. Suldo) or (813) 974-7007 (Dr. Shaunessy-Dedrick). 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 Office of Research Integrity and Compliance at the University of South Florida at 813-974-5638, and refer to eIRB # 22787.

☑ **Want Your Child to Participate?** To permit your child to participate in this study, complete the consent form below (titled “Consent to Take Part in this Research Study”). Have your child return the pink paper with the completed form to his or her designated teacher. Keep the other copy of this letter (printed on blue paper) for your records.

Sincerely,
Shannon Suldo (Professor, School Psychology) Elizabeth Shaunessy-Dedrick (Professor, Gifted Education)
Department of Educational & Psychological Studies Department of Teaching and Learning

---

**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.

<table>
<thead>
<tr>
<th>Printed name of child taking part in the study</th>
<th>Grade level of child</th>
<th>High school</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Signature of parent of child taking part in the study</th>
<th>Printed name of parent</th>
<th>Date</th>
</tr>
</thead>
</table>

**(Portion for USF to Complete): 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 telephone number has been provided in the event of additional questions.

<table>
<thead>
<tr>
<th>Signature of person obtaining consent</th>
<th>Printed name of person obtaining consent</th>
<th>Date</th>
</tr>
</thead>
</table>
Appendix E: Student Assent Form

Dear Student:

You are being asked to take part in a research study. This study is part of a larger project we are conducting. The goal of this study is to evaluate the long-term effects of the Advancing Coping and Engagement (ACE) program. The ACE program is a classroom curriculum that teaches students ways to manage stress from classes. ACE is for students in Advanced Placement (AP) or International Baccalaureate (IB) classes. This program aims to improve students’ academic and emotional well-being.

- **Who We Are:** We are USF Professors Shannon Suldo and Elizabeth Shaunessy-Dedrick. Our research team includes graduate students and school psychologists in the USF College of Education. We are doing the study with leaders in your school. That way, the study will provide information that will be helpful to students, teachers, families, and school leaders.

- **Why We’re Asking You to Take Part in the Study:** This study is part of a project titled, “Supporting High School Students in College-Level Classes.” You are being asked to take part in this follow-up study because in 2017-18, you took an AP or IB class, and also took part in an evaluation of the ACE Program on freshmen.

- **Why You Should Take Part in the Study:** Schools need effective ways to help high school students manage the demands of college-level courses. To address this need we are evaluating the ACE program. The ACE program was created to build all AP and IB students’ coping skills and strong connections to their school. The evaluation will determine the program’s impact on students’ emotional and academic well-being, when students are in grades 10 – 12. Please note you will not be paid for taking part in the study. However, all students who participate by completing a packet of surveys on personal well-being will receive a $10 gift card on each occasion.

- **What Will Happen During This Study:** You will be asked to complete a survey packet asking about how you cope with academic stress, feelings about school, and emotional well-being. Emotional well-being includes questions about students’ happiness and current symptoms of mental and psychological problems. Survey packets will be given up to two times per year, near the end of the fall and spring semesters. It will take about 45 minutes to complete this survey packet each time. All activities will be during regular school hours. They will be scheduled to be minimally disruptive to your academic day. You have the right to inspect the evaluation surveys before they are administered, if a request is made within a reasonable period of time. The surveys and directions for administering the surveys will be available at your school within a reasonable period of time prior to the evaluation administration. Participation in this study also involves a confidential review of your school records. This includes course enrollment, grades in each course, and end-of-course exam scores, attendance, and discipline history during the 2018-19, 2019-20, and 2020-21 school years. In total, participation in this follow-up study on the ACE program will take no more than 2 hours of your time each year, from 2018-19 to 2020-21.

- **Confidentiality of Your Responses:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study. You will receive no benefits by participating in this research study. Your 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, we will not share your individual responses with school system personnel or anyone other than us and our research assistants. Your responses will be assigned a code number to protect the confidentiality of your responses. Only we will have access to the locked file cabinet stored at USF.

DEPARTMENT OF EDUCATIONAL AND PSYCHOLOGICAL STUDIES • COLLEGE OF EDUCATION
University of South Florida • 4202 East Fowler Avenue – EDU 105 • Tampa, FL 33620-5650
(813) 974-3246 • FAX (813) 974-5814
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that will contain all records linking code numbers to participants’ names. All records from the study will be destroyed in five years. Although your specific responses will not be shared with school staff, if you indicate that you intend to harm yourself or someone else, or if your responses on surveys indicate extreme emotional distress, we will contact district mental health counselors to ensure your safety as well as others’ safety.

✓ **Please Note:** Your involvement in this research study is completely voluntary. By signing this form, you are agreeing to take part. If you choose not to participate, or if you wish to stop taking part in the study at any time, you will not be punished in any way. If you choose not to participate, it will not affect your grades or your relationship with your high school, USF, or anyone else. You do not have to participate in this study.

✓ **What We’ll Do With Your Responses:** We plan to use the information from this study to further evaluate a program created to promote academic success and emotional well-being among AP and IB students. The results of this study may be published. However, your responses will be combined with responses from other people in the publication. The published results will not include your name or any other information that would in any way personally identify you.

✓ **Questions?** If you have any questions about this study, please raise your hand now or ask us at any time. You may contact us later at (813) 974-2223 (Dr. Suldo) or (813) 974-7007 (Dr. Shaunessy-Dedrick). If you have questions about your rights as a person who is taking part in a research study, you may contact a member of the Office of Research Integrity and Compliance at the University of South Florida at 813-974-5638. Refer to eIRB # 22787.

Sincerely,
Shannon Suldo, Ph.D.                           Elizabeth Shaunessy-Dedrick, Ph.D.
Professor of School Psychology                     Professor of Gifted Education
Department of Educational and Psychological Studies    Department of Teaching and Learning

____________________________________________________________________________________________________________________

ASSENT TO TAKE PART IN THIS FOLLOW-UP RESEARCH STUDY

I freely give my permission to take part in this study. I understand that this is research. I have received a copy of this letter and assent form for my records.

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

(Section for USF to Complete): Statement of Person Obtaining Informed Assent

I certify that participants have been provided with an informed assent 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 assent   Printed name of person   Date

USF

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Appendix F: Data Collection Instructions

Spring 2019 Data Collection Instructions: End of Year Assessment for Year 4

Supplies necessary for the data collection:
- School roster list with student consent form status
- Survey packets with student code number and name on post-it note
- Student assent forms
- District A and B ONLY: gift cards and gift card documentation form
- Extra pens

Data Collection Instructions:
1. With the help of school coordinator, determine quiet space in school where individual or multiple students can complete the survey packet.
2. After student(s) is seated in their desk, ask the student for his/her name. Reference master list of participants to determine if the student should receive a survey packet (student assigned a code number on master list) or should not receive a survey packet (student code number is blacked out on master list).
3. Ask them to retrieve a pen from their bag (have extra pens on hand).
4. Give student the survey packet assigned to their name and code number and a stapled packet of two copies of the assent form
   - Tell student, Please don’t start writing until we give you instructions. But you can begin reading over the front and back of the assent form.
5. Once student(s) are checked-in and seated, introduce yourself and why they are completing this survey packet
   - Hello, I am [name], a researcher from the University of South Florida. We are conducting a follow-up study to evaluate the long-term effects of the Advancing Coping and Engagement (ACE) program. ACE is a classroom-based curriculum designed to teach freshmen in Advanced Placement courses or the International Baccalaureate program evidence-based strategies for managing stress tied to their rigorous courses. You are being asked to participate in the research study because during the 2017-2018 school year, you took part in the evaluation of ACE on student academic and emotional well-being during 9th grade. Thank you for being part of our research last year, and for your willingness to stay part of our evaluation of the ACE program as students progress through high school.
6. Have the student complete the assent form
   - Please look at the smaller stapled packet with the USF logo on the bottom; you should have two copies of the same letter- one is for you to keep and the other is for you to sign if you agree to participate in the evaluation of the ACE Program, which includes today’s questionnaire packet. Please follow along as I read the permission form aloud.
   - Read the student assent form (quickly!) aloud verbatim and then ask if there are any questions. Have student sign and print their name. Collect one copy and have student keep one copy.
7. Complete student demographics on survey packet
• Please look at the top page of your stapled packet. Confirm that the post-it note on the first page has your name. If it does not, let me know [pause, answer questions as needed]. If it matches your name, remove the post-it and we will come to collect them. Do not write your name on the packet—your answers are confidential and we do not want your name attached to any of your responses.

• We are going to get started together. First, write your birthdate (month, date, year) at the top left corner. Do NOT write the current year, but the year you were born.

• There are a few questions about the courses you are taking this year.
  i. The first question asks if you are currently in a pre-IB or IB program. Bubble in ‘yes’ or ‘no.’
  ii. The second question asks about your current and completed AP classes. Bubble in ‘yes’ or ‘no’ if you are currently taking AP classes. If you are in AP classes bubble in how many classes you are currently enrolled in. Next bubble in how many AP classes you are completed so far.

8. Have student complete two practice items
   • Now we’re going to answer some survey questions together. The format of these questions is like a few of the surveys in this packet. For each set of questions in the packet, you should read the directions and then carefully read each question and the answer choices. For example, let’s do the first few items of the first survey together, and then I’ll release you to complete the rest of your packet at your own pace.”
   • Read the instructions for the practice items together, and then complete the two practice items by bubbling in your response.
     • Make sure your answers are completely bubbled in.
     • If you decide to change your response, clearly mark an X over your answer. Then bubble in your desired answer.
     • Allow them time to respond alone. Check to make sure they are filling out items correctly.

9. Provide directions for how to complete the remainder of the packet.
   • “Are there any questions? You will have the bottom of the first page and eight more pages of questions to answer like the questions we just read together. Read the questions to yourself and work independently—you will have plenty of time. While you’re filling out the surveys—if you have a question about any of the items, please raise your hand and either me or one of my research assistants will come help you. PLEASE DO NOT SKIP ANY ITEMS! When you’re finished, raise your hand. One of us will skim through your packet to make sure you didn’t accidentally skip any pages or items.
   • DISTRICT A AND B ONLY: At the end, you’ll receive your movie pass (or iTunes gift cards) as our thank you for your time today. Please begin.”

10. While students are completing the survey packet:
    • Stay seated close to student or pace room to make sure students are answering the questions, not talking, completing the packet correctly, etc.
    • Note any students who are absent and problem-solve with school coordinator and teacher for when to return for make-ups.
    • DISTRICT A AND B ONLY: Prepare the movie passes or iTunes gift cards for distribution (pre-record the movie gift card numbers on the distribution record)

11. When a student is finished:
• “I’m going to glance through your surveys to make sure you didn’t accidentally skip any questions.”

• Skim through each page and look for missed pages or sections. Spot check that the birthday looks reasonable (2004 or earlier) and is not the current year.

• DISTRICT A AND B ONLY: Complete form needed for movie pass (or iTunes gift card). Record the number of the gift card next to the participant’s code number (from their survey packet). Write today’s date and initial. Then, have the students sign and date the signature page. Then give the student the movie pass (or iTunes gift card).

• Collect our pen from the student.
Appendix G: Demographics Form

Spring 2019 School: ____________________________ Version: ☐ ☐ ☐ ☐ Code #: ______

**Birthdate:** (month) / (day) / (year)

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

Are you currently taking any Advanced Placement (AP) classes? ☐ No ☐ Yes
  - If yes, how many AP classes are you currently taking?
    ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9
  - How many AP classes have you completed so far?
    ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

**PRACTICE ITEM #1**
*Think about the current school year. When you are (or have been) faced with school-related challenges or stress, how often do you:*

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Almost Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay after school for tutoring</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

**PRACTICE ITEM #2**
*Statement:*

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like being in school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

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## Appendix H: Number of Items Needed for Analysis

### Table A1: Number of Items Needed for Analysis

<table>
<thead>
<tr>
<th>Intervention Target/Composite</th>
<th>Individual Items</th>
<th>Number of Items Required for Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Engagement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective (Positive Emotions)</td>
<td>EVD6, EVD7, EVD8, EVD9, EVD10</td>
<td>4</td>
</tr>
<tr>
<td>Affective (Belongingness at School)</td>
<td>ISQ1, ISQ2, ISQ4R, ISQ5, ISQ8R, ISQ9R, ISQ10, ISQ12, ISQ13</td>
<td>7</td>
</tr>
<tr>
<td>Behavioral (In-Class Participation)</td>
<td>EVD1, EVD2, EVD3, EVD4, EVD5</td>
<td>4</td>
</tr>
<tr>
<td>Behavioral (Extracurricular Activities)</td>
<td>ECA1, ECA2, ECA3, ECA4, ECA5, ECA6, ECA7, ECA8, ECA9, ECA10, ECA11, ECA12</td>
<td>9</td>
</tr>
<tr>
<td>Cognitive (Goal Valuation)</td>
<td>SAASR9, SAASR10, SAASR12, SAASR15, SAASR18, SAASR19</td>
<td>5</td>
</tr>
<tr>
<td>Cognitive (Motivation/Self-Regulation)</td>
<td>SAASR3, SAASR5, SAASR6, SAASR14, SAASR16, SAASR17, SAASR20, SAASR21, SAASR22, SAASR23</td>
<td>7</td>
</tr>
<tr>
<td>Achievement Motivation (Valuing)</td>
<td>ISQ3R, ISQ6, ISQ7R, ISQ11, ISQ14R, ISQ15, ISQ16</td>
<td>5</td>
</tr>
<tr>
<td>Achievement Motivation (Academic Self-Perceptions)</td>
<td>SAASR1, SAASR2, SAASR4, SAASR7, SAASR8, SAASR11, SAASR13</td>
<td>5</td>
</tr>
<tr>
<td><strong>Coping</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approach/Problem-Focused</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time and Task Management (TTM)</td>
<td>TTM, CogR, SAS, TTF, Spir, Rel</td>
<td>6</td>
</tr>
<tr>
<td>Cognitive Reappraisal (CogR)</td>
<td>CADS19, CADS26, CADS29, CADS51, CADS56, CADS59</td>
<td>5</td>
</tr>
<tr>
<td>Seek Academic Support (SAS)</td>
<td>CADS27, CADS28, CADS49, CADS54</td>
<td>3</td>
</tr>
<tr>
<td>Turn to Family (TTF)</td>
<td>CADS20, CADS35, CADS36</td>
<td>3</td>
</tr>
<tr>
<td>Spirituality (Spir)</td>
<td>CADS5, CADS17, CADS32</td>
<td>3</td>
</tr>
<tr>
<td>Relaxation (Rel)</td>
<td>CADS6, CADS21, CADS39</td>
<td>3</td>
</tr>
<tr>
<td>Avoidance</td>
<td>CADS7, CADS31</td>
<td>2</td>
</tr>
<tr>
<td>Skip School (SkiS)</td>
<td>SkiS, SubU, RedE, Sleep, TSC</td>
<td>5</td>
</tr>
</tbody>
</table>

173
<table>
<thead>
<tr>
<th>Table A1: (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance Use (SubU)</td>
</tr>
<tr>
<td>Reduce Effort (RedE)</td>
</tr>
<tr>
<td>Sleep (Sleep)</td>
</tr>
<tr>
<td>Take Short Cuts (TSC)</td>
</tr>
<tr>
<td>Alone</td>
</tr>
<tr>
<td><strong>Eustress</strong></td>
</tr>
<tr>
<td><strong>Academic Burnout</strong></td>
</tr>
<tr>
<td>Exhaustion at School Work</td>
</tr>
<tr>
<td>Cynicism toward School</td>
</tr>
<tr>
<td>Sense of Inadequacy at School</td>
</tr>
<tr>
<td><strong>Mental Health</strong></td>
</tr>
<tr>
<td>Subjective Well-Being</td>
</tr>
<tr>
<td>Life Satisfaction</td>
</tr>
<tr>
<td>Positive Affect</td>
</tr>
<tr>
<td>Psychopathology</td>
</tr>
<tr>
<td>Internalizing Problems</td>
</tr>
<tr>
<td>Externalizing Problems</td>
</tr>
</tbody>
</table>
Appendix I: Researcher’s IRB Certification

CITI PROGRAM

Completion Date 17-Jun-2021
Expiration Date 16-Jun-2024
Record ID 40604515

This is to certify that:

Amanda Moseley

Has completed the following CITI Program course:

Human Research
(Curriculum Group)
Social/Behavioral Investigators and Key Personnel
(Course Learner Group)
3 - Refresher Course
(Stage)

Under requirements set by:

University of South Florida

Not valid for renewal of certification through CME.
Appendix J: Comparison of Sample Demographic Variables at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)

Table A2: Comparison of Sample Demographics on Y4 and Y3

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>Year 4 Sample</th>
<th>Year 3 Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>336</td>
<td>547</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>33.63%</td>
<td>36%</td>
</tr>
<tr>
<td>Female</td>
<td>66.37%</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>43.8%</td>
<td>47%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>22.6%</td>
<td>21%</td>
</tr>
<tr>
<td>Asian</td>
<td>14.3%</td>
<td>11%</td>
</tr>
<tr>
<td>Black</td>
<td>6.9%</td>
<td>7%</td>
</tr>
<tr>
<td>Multi-racial</td>
<td>12.5%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Program Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Placement (AP)</td>
<td>63%</td>
<td>64%</td>
</tr>
<tr>
<td>International Baccalaureate (IB)</td>
<td>36%</td>
<td>35.8%</td>
</tr>
<tr>
<td><strong>Treatment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment Group</td>
<td>58%</td>
<td>64%</td>
</tr>
<tr>
<td>Control Group</td>
<td>41%</td>
<td>35%</td>
</tr>
</tbody>
</table>
**Appendix K: Comparison of Coping Variables at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)**

**Table A3: Comparison of Coping Variables on Y4 and Y3**

<table>
<thead>
<tr>
<th>Intervention Targets</th>
<th>Year 4 p-value</th>
<th>Year 4 Standardized Effect</th>
<th>Year 3 p-value</th>
<th>Year 3 Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approach/Problem</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Focused Coping</strong></td>
<td></td>
<td></td>
<td>.09</td>
<td>0.16</td>
</tr>
<tr>
<td>Time and Task</td>
<td>.12</td>
<td>0.22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Reappraisal</td>
<td>.89</td>
<td>0.02</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Seek Academic</td>
<td>.18</td>
<td>0.22</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn to Family</td>
<td>.47</td>
<td>0.08</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Spirituality</td>
<td>.93</td>
<td>0.01</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Relaxation</td>
<td>.34</td>
<td>0.11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Avoidance Coping</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>.75</td>
<td>0.04</td>
<td>.13</td>
<td>-0.15</td>
</tr>
<tr>
<td>Skip School</td>
<td>.59</td>
<td>0.07</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.18</td>
<td>-0.15</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reduce Effort</td>
<td>.59</td>
<td>-0.06</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sleep</td>
<td>.34</td>
<td>-0.19</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Take Short Cuts</td>
<td>.90</td>
<td>0.03</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Appendix L: Comparison of Engagement Variables at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)

Table A4: Comparison of Engagement Variables on Y4 and Y3

<table>
<thead>
<tr>
<th>Intervention Targets</th>
<th>Year 4 p-value</th>
<th>Year 4 Standardized Effect</th>
<th>Year 3 p-value</th>
<th>Year 3 Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective (Belongingness at School)*</td>
<td>.01**</td>
<td>0.29</td>
<td>.01**</td>
<td>0.23</td>
</tr>
<tr>
<td>Behavioral (In-Class Participation)</td>
<td>.04**</td>
<td>0.24</td>
<td>.045**</td>
<td>0.19</td>
</tr>
<tr>
<td>Behavioral (Extracurricular Activities)</td>
<td>.04**</td>
<td>0.23</td>
<td>.64</td>
<td>-0.04</td>
</tr>
<tr>
<td>Cognitive (Self-Regulation)*</td>
<td>.65</td>
<td>0.05</td>
<td>.07</td>
<td>0.17</td>
</tr>
<tr>
<td>Cognitive (Goal Valuation)</td>
<td>.72</td>
<td>0.06</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Achievement Motivation (Value School)*</td>
<td>.23</td>
<td>0.20</td>
<td>.046**</td>
<td>0.27</td>
</tr>
<tr>
<td>Achievement Motivation (Academic Self-Efficacy)*</td>
<td>.15</td>
<td>0.17</td>
<td>.15</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Note. *= Significant Attrition Analysis Effect; **= p-value significant at the .05 level
Appendix M: Comparison of Eustress at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)

Table A5: Comparison of Eustress on Y4 and Y3

<table>
<thead>
<tr>
<th>Intervention Target</th>
<th>Year 4 $p$-value</th>
<th>Year 4 Standardized Effect</th>
<th>Year 3 $p$-value</th>
<th>Year 3 Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eustress</td>
<td>0.03*</td>
<td>0.38</td>
<td>0.04*</td>
<td>0.23</td>
</tr>
</tbody>
</table>

*Note.* *=p*-value significant at the .05 level
Appendix N: Comparison of Mental Health Outcomes at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)

**Table A6:** Comparison of Mental Health Variables on Y4 and Y3

<table>
<thead>
<tr>
<th>Intervention Outcomes</th>
<th>Year 4 p-value</th>
<th>Year 4 Standardized Effect</th>
<th>Year 3 p-value</th>
<th>Year 3 Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjective Well-Being</td>
<td></td>
<td>-</td>
<td>.49</td>
<td>.07</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>.69</td>
<td>0.05</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Life Satisfaction</td>
<td>.51</td>
<td>0.08</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Academic Burnout*</td>
<td>.90</td>
<td>-0.02</td>
<td>.01**</td>
<td>-.29</td>
</tr>
</tbody>
</table>

**Psychopathology**

<table>
<thead>
<tr>
<th>Intervention Outcomes</th>
<th>Year 4 p-value</th>
<th>Year 4 Standardized Effect</th>
<th>Year 3 p-value</th>
<th>Year 3 Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internalizing Problems</td>
<td>.95</td>
<td>0.01</td>
<td>.45</td>
<td>-.07</td>
</tr>
<tr>
<td>Externalizing Problems</td>
<td>.04**</td>
<td>-0.25</td>
<td>.37</td>
<td>-.08</td>
</tr>
</tbody>
</table>

*Note. *= Significant Attrition Analysis Effect; **= p-value significant at the .05 level
Appendix O: Comparison of Academic Outcomes at One-Year Follow-Up (Year 4) and Post-Intervention (Year 3)

Table A7: Comparison of Academic Variables on Y4 and Y3

<table>
<thead>
<tr>
<th>Intervention Outcomes</th>
<th>p-value</th>
<th>Standardized Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year 4 Academic Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th Grade Unweighted GPA</td>
<td>.28</td>
<td>-0.15</td>
</tr>
<tr>
<td>Average AP Exam Score</td>
<td>.60</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Year 3 Academic Achievement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9th Grade Unweighted GPA</td>
<td>.59</td>
<td>-0.07</td>
</tr>
<tr>
<td>AP Human Geography Exam Score</td>
<td>.12</td>
<td>-0.38</td>
</tr>
</tbody>
</table>