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Longitudinal Examination of a Dual-Factor Model of Mental Health: Academic Adjustment and Stability of Group Membership in High School Students in Academically Accelerated Curricula

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Longitudinal Examination of a Dual-Factor Model of Mental Health: Academic Adjustment and Stability of Group Membership in High School Students in Academically Accelerated Curricula

by

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ABSTRACT

Middle adolescence (ages 14 to 18 years old) has been associated with declines in both psychopathology and subjective well-being (SWB). This study examined a dual-factor model (DFM) of mental health, which conceptualizes complete mental health as including both low levels of psychopathology and high levels of SWB, across three time points, each 9-12 months apart, in a sample of 328 9th grade students enrolled in accelerated coursework. This study aimed to determine (1) the stability of students' mental health status over time, (2) the role of psychopathology versus SWB for students who changed mental health status, and (3) the relationship between students' initial mental health status at the beginning of 9th grade and academic outcomes (GPA, student engagement) over time. Descriptive analyses provided support for the moderate stability of mental health status within a DFM across time, with students who shifted mental health status tending to do so due to changes in both psychopathology and SWB. Multilevel modeling indicated that initial mental health status was linked to both immediate and long-term outcomes, especially for students with low levels of SWB. These findings contribute to the literature by utilizing clinically meaningful cut-scores across three waves of data and illustrating the importance of assessing and addressing SWB in addition to psychopathology, particularly due to the significant relationship between mental health status and both immediate and delayed academic outcomes.

CHAPTER ONE:

INTRODUCTION

Background Information and Rationale

Middle adolescence—between the ages of 14 and 18 years—is a crucial period of development that is marked by multiple physical, social-emotional, and academic transitions. Research indicates that the transition from middle to high school is associated with a decline in mental health, including increased feelings of anxiety and loneliness, and increased conduct problems (Benner & Graham, 2009; García-Moya et al., 2019). Some research also indicates that students' levels of subjective well-being (i.e., happiness) decrease during adolescence (Antaramian & Huebner, 2009; Goldbeck et al., 2007). A dual-factor model (DFM) of mental health offers a conceptualization of mental health that includes both positive indicators (i.e., life satisfaction, positive affect, negative affect) and negative indicators (i.e., psychopathology). This model addresses several issues with the more traditional model of mental health by recognizing that *complete mental health* involves both low levels of psychopathology and high levels of well-being (Suldo et al., 2016). A DFM was first proposed by Greenspoon and Saklofske (2001). Since then, research has examined the prevalence of a DFM during elementary school (Compton, 2016), middle school (Antaramian et al., 2010; Suldo & Shaffer, 2008), high school (Suldo et al., 2016), and college (Eklund et al., 2011). A limited number of longitudinal studies have investigated stability and change within a DFM (Kelly et al., 2012; Moore et al., 2019; Xiong et al., 2017). While these studies suggest that group membership in a DFM is modestly to moderately stable across time, more research with multiple waves of data is needed to confirm

these findings. Lastly, several studies have examined outcomes related to a DFM in adolescence, suggesting that both psychopathology and well-being have important implications for students' school experiences (Lyons et al., 2013; Moore et al., 2019; Suldo et al., 2016). Additional longitudinal studies are needed to determine the relationship between mental health status and both immediate and delayed academic outcomes.

Definition of Key Terms

Psychopathology

Psychopathology refers to the occurrence of psychological symptoms that result in maladaptive outcomes, such as impaired social functioning, academic difficulties, and physical symptoms (Lyons et al., 2012). Psychopathology encompasses both internalizing problems (e.g., depression, anxiety) and externalizing problems (e.g., hyperactivity, conduct problems; American Psychiatric Association [APA], 2013).

Subjective Well-Being

Subjective well-being (SWB) is "a scientific term for happiness" (Suldo et al., 2016, p. 434-435). SWB is comprised of three constructs: life satisfaction, positive affect, and negative affect (Diener, 2000). Life satisfaction refers to domain-specific (e.g., school, family, friends) and global judgments of one's life. Positive affect involves experiencing pleasant emotions and moods (e.g., interested, proud, delighted), while negative affect involves unpleasant emotions and moods (e.g., lonely, sad, frightened). Individuals with high SWB report high life satisfaction and experience more frequent positive affect than negative affect.

Dual-Factor Model

A dual-factor model (DFM) of mental health posits that mental health includes indicators of both psychopathology and subjective well-being (SWB). This approach results in four metal

health quadrants: complete mental health (low psychopathology and average-to-high SWB), symptomatic but content (elevated psychopathology and average-to-high SWB), vulnerable (low psychopathology and low SWB), and troubled (elevated psychopathology and low SWB). The current study used the terminology for these groups utilized by Suldo and Shaffer (2008). A visual summary of the four groups yielded by a DFM is displayed in Table 1.

Table 1

Mental Health Groups within a Dual-Factor Model of Mental Health

	Level of Subjective Well-Being	
Level of Psychopathology	Average-to-high	Low
Elevated	*Symptomatic but content youth*	*Troubled youth*
Low	*Complete mental health youth*	*Vulnerable youth*

Academic Adjustment

For the purposes of this study, academic adjustment involved both academic performance (i.e., students' GPAs) and student engagement, including affective engagement, behavioral engagement, and cognitive engagement (Suldo et al., 2016). Affective engagement refers to school belonging, students' relationships with their teachers and peers, and attitudes toward school and/or the classroom (Fredricks et al., 2019). Signs of behavioral engagement include on-task behavior, school attendance, effort, and attention in the classroom (Fredricks et al., 2019). Cognitive engagement involves learning through effort and self-regulation strategies (Fredricks et al., 2004; Fredricks et al., 2019).

Advanced Placement (AP)

Advanced Placement (AP) courses expose high school students to college-level coursework so they can develop skills needed for college success, earn college credit, and bypass introductory college courses (College Board, 2019a). To receive college credit for a course, students must earn a passing score on the end-of-course AP exam (typically a score of 3 or

higher on a 1 to 5 scale). There are currently 38 courses in 7 content areas that are typically completed by 11th and 12th grade students (College Board, 2019a). A limited number of AP courses are available for 9th and 10th grade students, such as AP Geography and AP World History. As of 2016, eight states and the District of Columbia required all high schools to offer AP coursework (Education Commission of the States [ECS], 2016). A total of 2,825,710 students took AP end-of-course exams in 2019 (College Board, 2019b). Of these, 226,553 were in 9th grade, 584,507 were in 10th grade, 1,003,269 were in 11th grade, and 953,146 were in 12th grade (College Board, 2019b).

International Baccalaureate Diploma (IBD) Program

The goal of the International Baccalaureate Diploma (IBD) program is to "develop students who have excellent breadth and depth of knowledge – students who flourish physically, intellectually, emotionally and ethically" (International Baccalaureate Organization [IBO], 2019a). Students in the IBD program enroll in accelerated academic coursework and complete graduation requirements beyond what the state typically requires (i.e., an oral presentation and essay assessing theory of knowledge, an independent extended essay, and a project related to creativity, activity, and service; IBO, 2019a; Suldo et al., 2008). While the IBD program is intended for students in grades 11-12, many schools offer pre-IB or AP courses to help prepare 9th and 10th grade students for the IBD curriculum. In 2019, 944 schools in 48 states plus the District of Columbia offered the IBD program (IBO, 2019c). A total of 87,887 students in the U.S. took IB exams in 2019 (IBO, 2019b).

Purpose of Current Study

This study used a longitudinal design to examine the stability of high school students' mental health status in a dual-factor model (DFM) of mental health as well as the relationship

between mental health status and immediate and delayed academic outcomes. The study was a secondary analysis of data collected as part of the development of an intervention focusing on 9th grade students in accelerated curricula (i.e., AP and IBD). Students completed a packet of questionnaires at three time points (9th grade fall, August 2017; 9th grade spring, April 2018; and 10th grade spring, April 2019). Using this longitudinal data, this study aimed to (1) add to the knowledge base on a DFM as it relates to high school students and (2) help educators better understand the association between mental health and academic concerns during middle adolescence. The specific research questions that were addressed are as follows:

1. To what extent is group membership in the four quadrants of a dual-factor model of mental health stable across 3 time points, each 9-12 months apart, for high school students enrolled in accelerated curricula?
    a. What percent of students are in each quadrant at each time point?
    b. What percent of students are in the same quadrant for 2 or 3 time points?
2. Assuming 1b is <100%, is change in group membership due to change in psychopathology, subjective well-being, or both for high school students enrolled in accelerated curricula?
3. For high school students enrolled in accelerated curricula, what is the relationship between group membership at Time 1 and:
    a. Students' academic performance at Times 2 and 3?
    b. Student engagement at Times 1, 2, and 3?

Contributions to the Literature

By answering the above questions, this study adds to literature on the stability of mental health in middle adolescence, as well as the relationship between mental health status and

academic adjustment. Specifically, this study was the first to use clinically meaningful cut-scores across three waves of data to examine the stability of a dual-factor model of mental health in adolescents. This study also was the first to investigate whether change in mental health status is due to changes in psychopathology, SWB, or both, which can help inform both prevention and intervention strategies targeting psychopathology and SWB. Lastly, these findings can help increase support for school-based mental health programs, as they demonstrate the relationship between mental health status and high school students' academic outcomes.

CHAPTER TWO:

REVIEW OF THE LITERATURE

The following chapter reviews literature relevant to the current study, beginning with an overview of the traditional model of mental health. This is followed by a discussion of a dual-factor model (DFM) of mental health, which incorporates both psychopathology and subjective well-being (SWB) as indicators of mental health. Next, the importance of focusing on mental health in middle adolescence is addressed, with a focus on the transition to high school and relevant developmental factors. Then, research on the stability of adolescents' mental health is reviewed, including research examining the stability of psychopathology, the stability of SWB, the stability of psychopathology and SWB simultaneously, and the stability of a DFM. Finally, the relationship between mental health status and academic adjustment is discussed.

Defining Mental Health

Traditional View

During the 20th century, there was an emphasis on the medical model of human functioning (Seligman & Csikszentmihalyi, 2000). Within this model, mental *disorders* are diagnosed based on the presence of psychopathology, whereas mental *health* is viewed as the absence of psychopathology. Psychopathology refers to behaviors, emotions, and cognitions that are viewed as abnormal or maladaptive (Maddux, 2005). More specifically, psychopathology includes internalizing problems (e.g., depression, anxiety) and externalizing problems (e.g., hyperactivity, conduct problems, anger/aggression; American Psychiatric Association [APA], 2013). The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5)

guides the diagnosis of externalizing and internalizing disorders by detailing the number and type of symptoms a person must exhibit in order to receive a specific diagnosis (APA, 2013). For example, to receive a diagnosis of Major Depressive Disorder (MDD), at least five of the specified symptoms (e.g., depressed mood or sadness most of the day, markedly diminished interest in activities, fatigue or loss of energy, feelings of worthlessness or guilt, recurrent thoughts of death or suicidal ideation) must be present for at least two weeks and cause clinically significant distress or impairment (APA, 2013). Treatment then aims to repair the maladaptive thoughts and behaviors associated with a diagnosis (Seligman & Csikszentmihalyi, 2000).

Seligman and Csikszentmihalyi (2000) assert that the traditional model of mental health reflects economic changes that occurred after World War II. First, the founding of the Veterans Administration allowed psychologists to earn money by treating mental illness. Second, the founding of the National Institute of Mental Health led to a proliferation of research grants focused on pathology (Seligman & Csikszentmihalyi, 2000). This emphasis on psychopathology resulted in several important developments, including an increase in the field's understanding of the causal pathways involved in mental illness, the development of a usable taxonomy for diagnosis, and extensive research on pharmacological and psychological treatment methods (Seligman & Csikszentmihalyi, 2000). For example, research on psychopathology has revealed a positive relationship between mental disorders and environmental stressors such as divorce, the loss of loved ones, and physical and sexual abuse (Seligman & Csikszentmihalyi, 2000). The prevalence of the traditional view is evident in the use of medical terminology such as symptom, disorder, illness, and treatment (Maddux, 2005).

Despite advancements in the field led by research on psychopathology, more recent literature has revealed several limitations of the traditional model. First, the medical model does

not aid in the prevention of mental disorders (Seligman & Csikszentmihalyi, 2000). Rather than receiving supports to prevent the initial development of externalizing or internalizing symptoms, individuals often receive treatment after obtaining a diagnosis. Additionally, research suggests that normality and abnormality exist on a continuum, with psychological disorders existing at the more extreme end of ordinary problems in living (Maddux, 2005). This continuum is evident in the diagnosis of personality disorders, where factor analytic studies demonstrate similarities between the general population and a population with personality disorders. The traditional model not only fails to acknowledge a continuum of maladaptive thoughts and behaviors, but also provides limited information on how to change or reduce levels of psychopathology (Maddux, 2005). In other words, the traditional model of mental health promotes a system of diagnosis and treatment based solely on identifying symptoms of psychopathology.

Dual-Factor Model

Given the limitations of the traditional model, there is a need for a broader understanding of mental health. The field of positive psychology offers an approach to mental health that focuses on subjective well-being (SWB), or happiness, in addition to the absence of psychopathology. Maddux (2005) describes positive psychology as "concerned with understanding what makes life worth living, with helping people become more self-organizing and self-directed" (p. 21). This view of mental health emphasizes building competency, fostering happiness, and acknowledging strengths in order to address some of the problems presented by the traditional model of mental health.

Keyes's (2006) study on the prevalence of positive mental health in adolescents demonstrates the importance of including measures of SWB in mental health models. The study aimed to answer (1) how many youth are mentally healthy or flourishing and how many are

mentally unhealthy, (2) whether flourishing youth report fewer depressive symptoms and conduct problems, and (3) whether flourishing youth display higher levels of psychosocial functioning compared to mentally unhealthy youth. Keyes relays two conceptualizations of SWB. The first is the hedonic stream, in which mental health is associated with happiness in life or the experience of positive emotions. The second is the eudaimonia stream, in which mental health is associated with realizing one's potential (Keyes, 2006). Keyes measured SWB using data from the Child Development Supplement (CDS-II) of the Panel Study of Income Dynamics (PSID), a national survey that accounts for both streams of SWB. Psychopathology was measured using the Child Depression Inventory (CDI; Kovacs, 1992). Results indicated that fewer adolescents were identified as mentally healthy (40%) than those that would have been identified by a model considering solely the absence of psychopathology. While limited by the use of self-report data and a cross-sectional design, these findings suggest that including SWB in the definition of mental health increases the number of youth identified with mental illness.

Diener et al. (2017) also discuss the importance of SWB in their review of advances in SWB research. They define SWB as people's affective and cognitive evaluations of their lives, with high SWB indicating many pleasant emotions and few unpleasant emotions, as well as satisfaction with life. This definition aligns with research indicating that positive and negative affect are two separate factors that tend to correlate with different variables (Diener et al., 2017). For example, positive emotions tend to correlate with social relationships and extraversion, while negative emotions tend to correlate with internal and interpersonal conflict, as well as the perception of problems (Diener et al., 2017). Diener et al. (2017) also describe how both environmental factors (e.g., marriage, unemployment, societal differences) and temperament and personality (e.g., adaptability, values) appear to affect levels of SWB. Thus, measures of SWB

that account for general and domain-specific life satisfaction, as well as both positive and negative affect, can help inform areas to target through intervention. While SWB alone may not be a sufficient measure of mental health, it is an important factor to consider when developing prevention and intervention methods (Diener et al., 2017).

In 2001, Greenspoon and Saklofske proposed a dual-factor model (DFM) of mental health, which posits that mental health includes two domains: psychopathology and subjective well-being (SWB). By including a measure of SWB, a DFM recognizes traditionally overlooked populations of students who either experience diminished emotional well-being or report average-to-high quality of life despite clinical levels of psychopathology (Suldo et al., 2016). In subsequent studies, this model of mental health was refined to be represented in four quadrants of mental health status: complete mental health (low psychopathology and average-to-high SWB), symptomatic but content (elevated psychopathology and average-to-high SWB), vulnerable (low psychopathology and low SWB), and troubled (elevated psychopathology and low SWB). This terminology was first advanced by Suldo and Shaffer (2008). Determining which quadrant a student falls in can have important implications for how mental health professionals identify students in need of support, as well as how schools prioritize intervention goals (Suldo et al., 2016).

Mental Health in Middle Adolescence

The following section reviews the importance of understanding and fostering students' mental health during middle adolescence, as well as research investigating mental health of adolescents in accelerated coursework and a dual-factor model of mental health in high school samples.

Importance of Middle Adolescence

Middle adolescence is a distinct period of development between the ages of 14 and 18 years that is characterized by several unique factors, such as physical changes, the transition to high school, increased academic stress, and new social experiences (e.g., new peer groups, forming romantic relationships, shifting family dynamics; Suldo et al., 2016). For example, high school is typically students' first exposure to a completely departmentalized curriculum and ordering of ability based on class rankings, as well as heightened pressure to decide who they are and who they want to be (Benner & Graham, 2009). Within the United States, approximately 22% of students meet criteria for a mental disorder with severe impairment during this developmental period (Merikangas et al., 2010). Benner and Graham (2009) followed a sample of students from seventh to 10th grade to assess how vulnerabilities associated with school transitions, such as a mismatch between students' stage of development and the demands of a school environment, relate to students' psychological functioning. The sample consisted of 1,979 students from 11 schools in metropolitan Los Angeles (mean age = 14.6 years, *SD* = 0.37 years). Participants were 46% male and 46% Latino, 21% African American, 11% Asian, 9% White, and 13% biracial or multiethnic. School climate was measured using an adapted version of the Effective School Battery (Gottfredson, 1984), which assesses how much students like school and how much they feel like they belong. Social anxiety was measured using the shortened Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998) and feelings of loneliness were measured using the Loneliness Scale (Asher & Wheeler, 1985). Piecewise growth modeling indicated that students' anxiety decreased across middle school but peaked at end of middle school, while feelings of loneliness significantly increased across high school. While limited by the use of a specific urban sample and multiple models that could increase Type I error rates

(Benner & Graham, 2009), these findings demonstrate the importance of examining the transition to high school as it relates to students' mental health.

García-Moya et al. (2019) also examined changes in mental health during adolescence. Grounded in research demonstrating the important role of the school environment (e.g., school connectedness, relationships with teachers and peers) in determining students' mental health status, their study aimed to determine the trajectory of emotional and conduct problems across the transition to middle adolescence. The sample consisted of 1,379 participants from a city in north Sweden. Students were approximately 12 years old at Time 1 (M = 12.5 years, SD = 0.33) and 15 years old at Time 2. Results from a repeated measures ANOVA revealed a significant decrease in positive school experiences over time, as well significant increases in emotional and conduct problems. A limitation to the study was the use of self-report measures for both mental health and school experiences, as well as limited generalizability outside of Sweden. Nonetheless, the findings demonstrate how mental health appears to decline during the transition to middle adolescence.

Mental Health of Adolescents in Accelerated Classes

Research suggests that students enrolled in accelerated coursework (e.g., AP or IBD) face mental health concerns similar to those of normative samples of high schools within the U.S. For example, Suldo et al. (2018) examined factors related to mental health and academic performance in a sample of 2,379 high school students enrolled in AP or IBD courses. Psychopathology was assessed using the Behavioral and Emotional Screening System (BESS; Kamphaus & Reynolds, 2007) of the Behavior Assessment System for Children, Second Edition (BASC-2), which measures frequency of internalizing problems, inattention/hyperactivity, social problems, and school problems using 30 items. SWB was indicated by life satisfaction, using the

Students Life Satisfaction Scale (SLSS; Huebner, 1991), which assesses global life satisfaction using a 6-point scale. Results indicated that 15.1% of students demonstrated Elevated Risk for psychopathology (Suldo et al., 2018), which is comparable to the 13% of youth classified as Elevated Risk in the national normative sample of this measure (Kamphaus & Reynolds, 2007). Over 66% of participants fell in the positive range for life satisfaction *(M* = 4.26, *SD* = 0.96). These findings align with scores observed in a study by Suldo et al. (2015) that examined a sample of 500 high school students not enrolled in accelerated coursework (*M* = 4.24, *SD* = 1.04).

Students in accelerated coursework also may experience heightened feelings of academic burnout. In the study by Suldo et al. (2018) described above, school burnout was assessed using the School Burnout Inventory (SBI; Salmela-Aro et al., 2009), which uses a 6-point scale to measure students' cynicism, sense of inadequacy, and feelings of exhaustion as they relate to school and schoolwork. Findings revealed that 71% of students enrolled in AP or IBD courses experienced symptoms of burnout (i.e., mean scores > 3.0), suggesting that high levels of school burnout are a concern for students in this population. Notably, prior research indicates that school burnout predicts both depressive symptoms and SWB in adolescence. Salmela-Aro et al. (2008) investigated the degree to which school burnout predicts later depressive symptoms in a sample of 474 adolescents. School burnout was assessed using the SBI (Salmela-Aro et al., 2009) and depressive symptoms were assessed using the DEPS scale (Salokangas et al., 1994), which asks students to report on depressive mood over the last month. Findings indicated that school burnout positively predicted later depressive symptoms across three time points (Salmerla-Aro et al., 2008). Raiziene et al. (2013) examined the relationship between school burnout and SWB in a longitudinal sample of 781 high school students. School burnout was

assessed using the SBI (Salmela-Aro et al., 2009) and SWB was measured using the Lithuanian version of the Satisfaction with Life Scale (SWLS; Diener et al., 1985), which assesses students' global judgements of life satisfaction. Results demonstrated a significant negative relationship between school burnout and SWB at Time 1. Further, school burnout at Time 1 negatively predicted SWB at Time 2 (Raiziene, 2013). Findings from these two studies therefore suggest that students enrolled in accelerated coursework may experience heightened mental health problems due to elevated levels of academic burnout.

Research examining the types of mental health problems experienced by adolescents in accelerated coursework has revealed notably low rates of externalizing problems, but typical rates of internalizing problems (Shaunessy et al., 2006; Suldo & Shaunessy-Dedrick, 2013). Shaunessy et al. (2006) compared symptoms of psychopathology experienced by students in the IBD program to students in general education. Psychopathology was assessed using the Youth Self-Report of the Child Behavior Checklist (YSR; Achenbach & Rescorla, 2001). Results indicated that both gifted and high-achieving youth in the IBD program reported lower levels of externalizing symptoms (M = 10.64, SD = 5.33 and M = 10.34, SD = 5.06, respectively) than youth in general education (M = 14.30, SD = 8.33; d = .25). Internalizing symptoms were not significantly different across groups (for gifted youth, M = 12.30, SD = 8.85; for high-achieving youth, M = 15.41, SD = 8.28; for youth in general education, M = 14.92, SD = 10.43). Suldo and Shaunessy-Dedrick (2013) found similar results in a sample of 9th grade students followed across two time points, one semester apart. Students were enrolled in either the IBD program or general education courses. Psychopathology again was assessed using the YSR (Achenbach & Rescorla, 2001). While students in the general education group tended to report higher levels of externalizing problems at Time 1 (p = .01) and Time 2 (p = .03), students from the two curricular

groups reported comparable levels of internalizing problems across both time points (p = .12 and .94, respectively).

Dual-Factor Model in High School

Lyons et al. (2012) were among the first to extend research investigating a DFM to a sample of middle and high school students. Their study aimed to determine how personality, environmental, and perceived support variables influenced the classification of adolescents within a DFM. Participants were 990 students (grades 6-12) from three middle schools and two high schools in one district in the Southeastern United States. The mean age was 14.62 years (SD = 2.06). The sample was 64% female and 60% of students received free or reduced-price lunch. Students' life satisfaction was measured using the SLSS (Huebner, 1991). Psychopathology was measured using the internalizing and externalizing subscales of the Youth Self-Report (YSR; Achenbach, 1991). Students were classified as one of the four mental health quadrants based on cut-scores used by Antaramian et al. (2010). The majority of students (n = 626) fell in the positive mental health group (i.e., complete mental health). Seventy-two students were considered vulnerable and 87 students were considered symptomatic but content. Troubled students represented the second largest quadrant (n = 197). Age, gender, and SES were approximately equivalent across groups. These findings align with previous research classifying students using cut-scores (see Antaramian et al., 2010; Suldo & Shaffer, 2008). Multinomial logistic regression analyses were then used to predict group membership based on personality, environmental, and perceived support variables. While extraversion and neuroticism demonstrated a significant relationship with group membership in the troubled and symptomatic but content groups, this was not the true for the vulnerable group (Lyons et al., 2012). Perceived parent support was related to group membership in the vulnerable and troubled groups.

Experiencing stressful life events predicted membership in the troubled group. This study was limited by a homogeneous sample and cross-sectional data. Nonetheless, the findings demonstrate how a DFM accounts for additional groups of adolescents who would not be recognized by a traditional model of mental health (Lyons et al., 2012).

Suldo et al. (2016) also examined a DFM in a sample of middle adolescents (ages 14-18 years). Their study aimed to estimate the proportion of high school students comprising each quadrant of the model, compare the prevalence of students in each quadrant to prior studies on different age groups, and determine differences in group outcomes. Self-report data were collected from 500 9th, 10th, and 11th grade students from two public high schools in large school district in the southeastern United States. Participants at each school were 37.9% White and 49.7% White, respectively. Fifty-nine percent of the sample was female and approximately half of the sample was eligible for free or reduced-price lunch. Students' membership in a DFM was determined using measures of SWB and psychopathology. SWB was measured using the SLSS (Huebner, 1991) and the Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999), which assess frequency of positive affect (e.g., excited, interested) and negative affect (e.g., jittery, lonely). Psychopathology was measured using the Self-Report of Personality form (SRP-A) of the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004). Findings supported the existence of a DFM in middle adolescents, with a sizable number of students in each of the four possible quadrants. The majority of students were classified as complete mental health (62.2%). Fifteen percent appeared troubled, 11.4% appeared symptomatic but content, and 11.4% appeared vulnerable (Suldo et al., 2016). This distribution across quadrants aligns with the results of Lyons et al. (2012), despite that study's

methodological limitations (e.g., use of a cross-sectional design). Findings regarding student outcomes are summarized below (see section titled "Mental Health and Academic Adjustment").

Rose et al. (2017) expanded on research investigating a DFM during adolescence by identifying mental health statuses in a sample of Black adolescents. The sample consisted of 1,170 students ages 13 to 17. Approximately 70% of students were African American and approximately 30% were of Caribbean descent. Fifty-two percent of the sample was female. SWB was conceptualized as life satisfaction, psychological well-being (i.e., self-esteem, mastery, positive relations with others), and social integration. Life satisfaction was measured using a single item from the National Survey of Black Americans ("*How satisfied with your life as a whole would you say you are these days*?"; Jackson & Neighbors, 1997). Psychological well-being was assessed using the Rosenberg Self-Esteem scale (RSES; Rosenberg, 1965) and Pearlin's Mastery scale (Pearlin & Schooler, 1978), which assesses students' sense of control over life changes, as well as a single item asking, "*how satisfied are you with the quality of the relationships you have with the people in your family/with your friends*?" Social integration was measured using an 8-item scale that assesses students' perceptions of their neighborhoods. Psychopathology was conceptualized as depressive symptoms, number of disorders, and disorder severity. These components were measured using the Center for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977) and the DSM-IV World Mental Health Composite International Diagnostic Interview. Latent class analysis was used to determine mental health groups based on these measures. This yielded four mental health classes that aligned with a DFM. Twenty percent of students were classified as vulnerable (low SWB, low psychopathology), 16% were classified as troubled (low SWB, high psychopathology), 13% were classified as symptomatic but content (high SWB, high psychopathology), and 51% were

classified with positive mental health (highest scores on SWB, lowest scores on psychopathology). Older participants had higher odds of being classified as symptomatic but content compared to positive mental health (OR = 1.264) and females had higher odds of being in the troubled group (OR = 1.865). While limited by the use of a cross-sectional design and limited generalizability to other subgroups, these findings provide further evidence for a dual-factor model of mental health (Rose et al., 2017).

Stability of Mental Health Over Time

Several longitudinal studies have been conducted on adolescents' mental health over the last twenty years. The following section reviews the stability of adolescents' mental health, starting with studies investigating the stability of adolescents' psychopathology. Next, studies focused on the stability of adolescents' well-being are reviewed, followed by research examining the stability of both psychopathology and well-being measured simultaneously. Finally, studies exploring the stability of mental health status in a dual-factor model are discussed.

Research Examining Stability of Psychopathology

Longitudinal studies on psychopathology in adolescence reveal moderate to high levels of stability (Pettit et al., 2005; Prenoveau et al., 2011; Reitz et al., 2005). For example, Reitz et al. (2005) examined the stability of externalizing and internalizing behavior in a sample of 650 eighth grade students (M = 13.36 years, SD = 0.55 years) over a 1-year period. Both externalizing and internalizing problems were measured with an expanded version of the Youth Self-Report (YSR; Achenbach, 1991), as well as with two scales developed to assess school problems and disobeying parents (Reitz, 2005). Results indicated that about half of students with internalizing or externalizing symptoms continued to display symptoms one year later. For girls, correlations between Time 1 and Time 2 indicated moderate to high stability of symptoms (r =

.45 for delinquent behavior, r = .59 for aggressive behavior, r = .54 for anxious/depressed, r = .54 for withdrawn, and r = .60 for somatic complaints). Correlations also indicated moderate to high stability for boys (r = .50 for delinquent behavior, r = .61 for aggressive behavior, r = .57 for anxious/depressed, r = .60 for withdrawn, and r = .49 for somatic complaints). Findings indicated that 37% of boys who scored high on externalizing problems (i.e., *T*-scores of 64 or higher based on Achenbach's [1990] norms) at Time 1 continued to score high at Time 2. Fifty-eight percent of girls who scored high on externalizing problems at Time 1 continued to score high at Time 2. For externalizing problems, 91% of boys who scored in the normal range at Time 1 remained in that category at Time 2 compared to 84% of girls. For internalizing problem behavior, boys in the high range demonstrated slightly more stability than girls (59% compared to 43%), while boys in the normal range demonstrated statistically significant more stability than girls (93% compared to 82%).

Pettit et al. (2005) also used a longitudinal design to examine the stability of mental illness diagnoses in youth. The study aimed to determine (1) the stability of different forms of psychopathology and (2) the relationship between diagnostic stability and length or number of hospitalizations. The sample was 815 students with at least two hospitalizations at one psychiatric center in Houston. The mean age of participants was 12.5 years during first hospitalization (SD = 2.9 years). Archival data were pulled from the center's records; thus, psychopathology was measured based on DSM-III-R or DSM-IV diagnoses from attending psychiatrists. Using positive concordance rates, which indicate the percentage of students diagnosed with a disorder at one point who manifest the same disorder at a later time, and kappa coefficients, which account for both positive and negative concordance rates, the study found that internalizing disorders displayed moderate to high levels of stability (positive concordance =

71%, kappa = 0.43). While externalizing disorders demonstrated relatively low positive concordance rates (positive concordance = 60%), their kappa value (0.39) was similar to those of internalizing disorders. Pettit and colleagues noted that the study was limited by inconsistencies in diagnosis and diagnostic classification methods.

Prenoveau et al. (2011) further examined the stability of psychopathology by measuring symptoms of depression, social phobia, and specific phobia across three time points each one year apart. Unlike many studies measuring psychopathology, disorders were assessed using both questionnaires and interview measures. Depression was measured using the Inventory to Diagnose Depression (IDD; Zimmerman et al., 1986) and the Mood and Anxiety Symptom Questionnaire (MASQ; Watson et al., 1995). Social anxiety was measured using eight items from the Self-Consciousness subscale of the Social Phobia Scale (SPS-SC; Mattick & Clarke, 1998) and specific phobia was measured using the Fear Survey Schedule II (FSS-II; Geer, 1965). All three disorders were also assessed using the Structured Clinical Interview for the *DSM–IV*, nonpatient edition (SCID-IN/P; First et al., 2002). Participants were 627 students from two high schools (one in Los Angeles and one in Chicago). The mean age was 16.9 years (*SD* = 0.4 years). The sample was 68.9% female and 48.2% Caucasian, 15.3% Hispanic/Latin American, 12.9% African American, 4.3% Asian, and 0.6% Pacific Islander. Approximately 13% of students reported multiple ethnicities and 5.4% identified as other. The stability of symptoms was analyzed by examining longitudinal measurement model parameter estimates for one-, two-, and three-year correlations. The results indicated that symptoms of social anxiety and specific phobia had high relative stability (*r* = .73, .70, .59 and *r* = .76, .74, .64, respectively). Stability estimates for symptoms of depression were significantly lower than estimates for anxiety, although depression still demonstrated moderate stability (*r* = .62, .46, and .46). These findings convey

how differentiating among different types of disorders can help inform both stability research and mental health interventions (Prenoveau et al., 2011).

Research Examining Stability of Well-Being

A limited number of studies have investigated the stability of well-being in adolescents. Antaramian and Huebner (2009) evaluated the long-term stability of life satisfaction, which is a component of the more comprehensive construct of subjective well-being. Their study followed a sample of 84 eighth grade students from one city in the Southeastern United States across three time points, each one year apart (i.e., during Grades 8, 9, and 10). The sample was 65% female and 48% were eligible for free or reduced-price lunch. Based on research demonstrating the multiple environmental and maturational transitions that occur during adolescence, the authors hypothesized that life satisfaction would decrease over time. Life satisfaction was measured using the Multidimensional Students' Life Satisfaction Scale (MSLSS; Huebner, 1994), which is a 40-item measure that assesses students' cognitive appraisal of their overall quality of life, as well as quality of life within specific domains. Test-retest reliability coefficients revealed modest to moderate correlations across 1-year intervals (r = .48-.59) and 2-year intervals (r = .41-.59) with the exception of 1-year reliability for satisfaction with friends (r = .27) and satisfaction with self (r = .29). Satisfaction with living environment was significantly lower in Grade 10 than in Grades 8 (Cohen's d = .21) and 9 (Cohen's d = .32). Additionally, means for satisfaction with family, friends, school, and self tended to decrease across the two years, although mean differences were not statistically significant. Despite the use of a small sample from a single city, the findings provide evidence for long-term stability of life satisfaction in middle adolescence. Notably, the degree of stability appears to differ across domains (Antaramian & Huebner, 2009).

Goldbeck et al. (2007) also investigated changes in adolescents' life satisfaction over time. The sample consisted of 1,274 German students (52% male) aged 11 to 16. Life satisfaction was measured using the adolescent version of the Questions on Life Satisfaction (Henrich & Herschbach, 2000), which asks respondents to indicate their satisfaction within eight domains: friends, leisure, time/hobbies, general health, income/pocket money, school, housing/living conditions, family life, and partnership/sexuality. Effects of gender and age were assessed using ANOVAs. Results indicated that there was a significant moderate main effect of age on students' general life satisfaction and a significant small effect on health-related life satisfaction. Life satisfaction decreased linearly across age groups for both genders (Goldbeck et al., 2007).

Lewis et al. (2011) also reported on the stability of well-being in their study on the relationship between life satisfaction and student engagement during middle school. Similar to Antaramian and Huebner (2009) and Goldbeck et al. (2007), the study focused on life satisfaction rather than the more comprehensive construct of SWB. Grounded in a positive psychology framework, their study measured life satisfaction using the SLSS (Huebner, 1991). At Time 1, the sample was 864 students in seventh and eighth grade (mean age = 12.68 years, *SD* = .67). Relevant findings indicate that SLSS scores were moderately stable across two time points that were separated by five months (with Time 2 occurring later in the same school year). There were significant mean differences in SLSS average scores between Time 1 (*M* = 4.46, *SD* = 1.00) and Time 2 (*M* = 4.58, *SD* = 1.02), which indicated that life satisfaction increased slightly over the school year in this sample (Lewis et al., 2011). While these results align with Antaramian and Huebner's (2009) finding that life satisfaction was modest to moderately stable

over time, they contradict their findings that life satisfaction tended to decrease slightly during adolescence.

Steinmayr et al. (2019) also found increases in life satisfaction over time in their sample of 476 German adolescents (approximately 49% male). School in Germany is mandatory for Grades 1-10 and voluntary for Grades 11-13. Steinmayr et al. (2019) assessed students' SWB at four time points: the beginning of Grade 11 (mean age = 16.43, *SD* = 0.55), the beginning of second semester in Grade 11, the beginning of second semester in Grade 12, and the beginning of second semester in Grade 13. SWB was measured using a shortened version of the Habitual SWB Scale (HSWBS; Dalbert, 2003) which assesses students' mood-level (five items) and life satisfaction (seven items; e.g., "I am satisfied with my life," "When I look back on my life so far, I am satisfied," "I believe that much of what I hope for will be fulfilled"). Factor loadings of slope factors indicated that students' life satisfaction did not increase significantly from Time 1 (*M* = 5.11, *SD* = 1.07) to Time 2 (*M* = 5.11, *SD* = 1.15) but did increase significantly from Time 2 to Time 3 (*M* = 5.26, *SD* = 1.04) and from Time 3 to Time 4 (*M* = 5.30, *SD* = 1.15; Steinmayr et al., 2019). Thus, some research suggests that adolescents' life satisfaction increases slightly over time.

Kiang and Ip (2018) also conducted a longitudinal study on the stability of well-being. The study followed 180 9th and 10th grade Asian American students from six public high schools across three years, yielding four waves of data each one year apart. The sample was 59% female, with a mean age of 15 years (*SD* = 0.92). Well-being was measured using five factors from Ryff's (1989) model of well-being, including positive relationships with others, purpose in life, personal growth, environmental mastery, and autonomy. Latent class analysis yielded four well-being profiles: hindered (consistently below average well-being), functioning (moderate well-

being), self-driven success (above-average well-being on all dimensions except positive relationships), and flourishing (above-average well-being on all dimensions). Students considered flourishing or self-driven demonstrate higher well-being, students considered functioning demonstrate lower well-being, and students considered hindered demonstrate the lowest well-being. The functioning group was the most prevalent, while the self-driven group was the least prevalent. The flourishing and self-driven groups were the least stable across time, with a 41% and 43% probability of staying in those groups at any time point. The functioning and hindered groups demonstrated higher stability, with a 67% and 66% probability of staying in those groups across time (Kiang & Ip, 2018). These findings suggest that students with lower well-being demonstrate greater stability across time compared to students with higher well-being.

In sum, research on the stability of SWB in adolescents yields mixed findings. Two studies reported modest to moderate stability of life satisfaction—a component of the construct of SWB—across adolescence (Antaramian & Huebner, 2009; Lewis et al., 2011). Further, Kiang and Ip (2018) found that students with higher well-being demonstrated less stability than students with lower well-being. While two studies found that life satisfaction tended to decrease as youth age (Antaramian & Huebner, 2009; Goldbeck et al., 2007), two other studies found that life satisfaction significantly increased over time (Lewis et al., 2011; Steinmayr et al., 2019).

Research Examining Stability of Psychopathology and Well-Being Simultaneously

Research investigating the stability of both psychopathology and well-being simultaneously is also limited. It is possible that this absence of research reflects the prevalence of the traditional model of mental health, which defines mental health as the absence of psychopathology. Suldo and Huebner (2004) provide evidence for the stability of life

satisfaction, internalizing behaviors, and externalizing behaviors in their study on the effects of life satisfaction on the relationship between stressful events and psychopathology. Using a positive psychology framework, their first research question aimed to determine whether global life satisfaction in adolescents demonstrates significant stability across two time points one year apart. Life satisfaction was measured using the SLSS (Huebner, 1991) and externalizing and internalizing symptoms were measured using the YSR (Achenbach, 1991). At Time 1, the sample consisted of 1,045 students in grades 6 to 11 (mean age = 14.2, *SD* = 1.8) from three middle schools and two high schools. The sample was 64% female, 58% African American, and 34% Caucasian. Fifty-nine percent of students were eligible for free or reduced-price lunch. Test-retest correlations for Time 1 and Time 2 were .57, .63, and .65 for life satisfaction, internalizing behaviors, and externalizing behaviors, respectively. Although the study was limited by a nonrepresentative sample and use of self-report data, the results suggest that both life satisfaction and measures of psychopathology are relatively stable during adolescence (Suldo & Huebner, 2004).

Marques et al. (2011) also used a positive psychology framework in their study on change in life satisfaction and mental health over time. Their longitudinal study measured life satisfaction across three time points during middle school using the SLSS (Huebner, 1991). Mental health was measured across the three time points using the Mental Health Inventory-5 (MHI-5) of the Short Form-36 Health Survey (SF-36; Ware et al., 1993), which assesses respondents' perceived quality of life and the absence of psychological distress (Marques et al., 2011). At Time 1, the sample was 367 students ages 11 to 15 (*M* = 11.78, *SD* = 1.22). Approximately 53% of the sample was female. Repeated measures ANOVAs revealed no significant mean differences in students' mental health across time. One- and two-year test-retest

correlations were high for both life satisfaction (r = .56 and .51, respectively) and mental health (r = .49 and .47, respectively). These findings align with the results of Suldo and Huebner's (2004) study and add support to research demonstrating the moderate stability of psychopathology and well-being throughout adolescence.

Research Examining Stability of a Dual-Factor Model

A few longitudinal studies have explored the stability of adolescents' mental health status within a DFM. Kelly et al. (2012) were the first to assess stability and dynamics of students' group membership using a two-wave longitudinal design. The study aimed to answer: (1) what is the stability of group membership in a DFM? and (2) do social support variables predict changes in group membership? Subjective well-being was measured using both the SLSS (Huebner, 1991) and the PANAS-C (Laurent et al., 1999) to determine students' life satisfaction and frequency of positive and negative affect. Psychopathology was assessed using the internalizing and externalizing subscales of the Self-Report Coping Scale (SRCS; Causey & Dubow, 1992), which measures the use of coping behaviors in stressful situations (e.g., "become so upset that I can't talk to anyone," "curse out loud"). Participants were 730 seventh and eighth grade students (ages 11-15) from one middle school in the Southeastern United States. The sample was 60% White, 51% female, and 21% of students were eligible for free or reduced-price lunch. Participants' levels of psychopathology and SWB were determined according to *T*-scores. Participants with a *T*-score of 60 or higher on one or both subscales of the SRCS were considered high in psychopathology. Participants with a *T*-score of 40 or lower on the SWB composite score were considered low in SWB. Participants were reclassified five months later, and 12 subgroups were created to determine how group membership changed across the two time points.

Results indicated that complete mental health was the most stable group, with 85% of participants who were classified as complete mental health at Time 1 remaining at Time 2. Students who remained in the complete mental health group were more likely to have good relationships with teachers or strong family support. Vulnerable youth demonstrated the least stability, with 29% remaining at Time 2. These students were more likely to move to the complete mental health group if they received greater social support or had better relationships with teachers. The symptomatic but content and troubled youth demonstrated moderate stability (42% and 47%, respectively). Notably, of students with high psychopathology (i.e., symptomatic but content or troubled youth), those with higher SWB were more likely to move to complete mental health than those with low SWB. Despite limited generalizability and small sample sizes in some groups, these findings suggest that students with complete mental health demonstrate the most stability over time (Kelly et al., 2012).

Xiong et al. (2017) extended Kelly et al.'s (2012) research by investigating how mental health groups in a DFM differ across time in a sample of Chinese middle school students. First, a cross-sectional design was used to explore differences in self-efficacy beliefs and academic emotions based on group membership in a DFM. Then, longitudinal data were used to examine stability of group membership based on Kelly et al.'s (2012) standards. A total of 1,293 Chinese adolescents from six schools participated in the cross-sectional study (mean age = 14.71, *SD* = 1.90). The sample was approximately 53% male and 28.6% of students were identified as having a low socioeconomic status (SES). A total of 531 adolescents participated in the longitudinal study (mean age = 14.65, *SD* = 1.96). This sample was approximately 56% male (27.9% low SES). Psychopathology was measured using the Youth Self-Report (Achenbach, 1991), as well as the Conduct Problems Scale (Fang et al., 1996), a 23-item scale that assesses externalizing

problems. SWB was measured using the Satisfaction with Life Scale (SWLS; Pavot & Diener, 1993) and the PANAS (Watson et al., 1988). Students with *T*-scores at or above 67 for internalizing disorders and/or 60 for externalizing disorders were classified as high in psychopathology. Based on Suldo and Shaffer's (2008) proposal that cut-scores for SWB "correspond with the percentage of youth with high or low psychopathology" (p. 59), students with a composite score of SWB above the 30th percentile were classified as average-to-high in SWB (Xiong et al., 2017).

At Time 1, 60.8% of students were classified as complete mental health. Nineteen percent were considered vulnerable, 10.9% were considered troubled, and 9.2% were considered symptomatic but content (Xiong et al., 2017). At Time 2, 64.4% of students demonstrated no change in mental health status. While 80.2% of students remained in the complete mental health group, only 34.5% remained in the troubled group. Students who were considered vulnerable at Time 1 were the most likely to transition to the complete mental health group (39.6%) and the troubled group (13.9%). Despite demonstrating low levels of psychopathology, students classified as vulnerable reported worse efficacy beliefs, less enjoyment, and high levels of hopelessness and frustration related to learning than the complete mental health group. Conversely, students in the symptomatic but content group reported higher efficacy beliefs, more enjoyment, and lower levels of hopelessness and frustration compared to the troubled group. These findings demonstrate the importance of considering SWB when assessing students' mental health status. Further, the results support Kelly and colleagues' (2012) findings, suggesting that mental health status within a DFM is relatively stable over time, with the complete mental health group demonstrating the highest stability.

Moore et al. (2019) also examined the stability of group membership within a DFM. Their study aimed to address issues with determining group status using cut-points, given the unclear criteria regarding where to set cut-points and insensitivity to degrees of variation in mental health status (Moore et al., 2019). The sample consisted of 332 students from one high school in central California. Approximately half of the sample was female and 47.5% of students were identified as low SES. Participants were followed across three years (grades 9-11). The final sample size at Time 3 was 291 students. Mental health was measured using (1) the Social–Emotional Health Survey-Secondary (SEHS-S; You et al., 2014), which assesses four positive mental health domains (belief in self, belief in others, emotional competence, and engaged living) considered to underlie SWB, and (2) the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), which measures behaviors and feelings (primarily with respect to types of psychopathology: peer problems, inattention-hyperactivity, conduct problems, and emotional symptoms; and one factor assessing prosocial behavior) over the last six months.

Using latent profile analysis, Moore et al. (2019) found four groups of mental health status that were consistent across all three time points, which they labeled complete mental health (high well-being, low distress), moderately mentally health (high-average well-being, low distress), symptomatic but content (high-average well-being, higher distress), and troubled (below average well-being, average to above average distress). The majority of students demonstrated complete mental health or were moderately mentally healthy across time. The complete mental health group was smallest at Time 3 (21% compared to 31% at Time 1 and 41% at Time 2) and the moderately mentally health group was smallest at Time 2 (32% compared to 43% at Time 1 and 44% at Time 3). The troubled group was consistent over time (6%, 6%, 4%, respectively), while the symptomatic but content group increased (20%, 21%, 31%,

respectively). The study was limited by the small number of students in the troubled group (20 students at Time 1 and Time 2, 12 students at Time 3), which could have reduced power, as well as by the use of self-report data, lack of direct assessment of SWB, and lack of data indicating if students received any intervention. Overall, these findings demonstrate the need to regularly monitor students' mental health status within a DFM (Moore et al., 2019).

Three known dissertations also have examined the stability of group membership within a DFM. Moore and colleagues' (2019) reported on some of Moore's (2018) dissertation, which examined change in mental health subtype across two cohorts (grades 9 to 11 and grades 10 to 12) in addition to empirically identifying mental health groups using latent profile analysis. A sample of 875 students (approximately 50% female) was used to investigate the stability of students' mental health status. About half of the students were eligible for free or reduced-price lunch. Mental health was assessed using the same measures described above. Latent transition analysis was used to examine the stability of mental health groups over the four school years. While less than 24% of students remained in the same group across all four years, the complete mental health group showed the greatest average stability (10%), followed by the moderately mentally healthy group (9%). The troubled group demonstrated the least stability (0.4%). Overall, students whose mental health status changed across the three time points tended to move toward groups with higher well-being, with a trend toward moderate or complete mental health being the most common. These findings generally align with those of Kelly et al. (2012) and Xiong et al. (2017), although a smaller percentage of students maintained the same mental health status across time. It is possible that this discrepancy reflects the inclusion of a third time point.

McMahan (2012) examined the stability of a DFM in a sample of high school students across two time points one year apart. Her sample consisted of 425 adolescents from two schools

located in a large school district in the Southeastern United States. Approximately half of the sample was eligible for free or reduced-price lunch and 60% of participants were female. Psychopathology was measured using the SRP-A form of the BASC-2 (Reynolds & Kamphaus, 2004). Subjective well-being was measured using both the SLSS (Huebner, 1991) and the PANAS-C (Laurent et al., 1999). Students were assigned to the four quadrants of a DFM using cut-scores. Specifically, level of psychopathology was determined based on published norms for the BASC-2, while level of SWB was determined based on sample-specific percentiles. Descriptive analyses then were used to examine how group membership changed over time. Relevant findings indicated that approximately 60% of students maintained the same mental health status across time, with the complete mental health group demonstrating the most stability (i.e., about 80% of students with complete mental health at Time 1 were classified as complete mental health at Time 2). The symptomatic but content group was the least stable, with 17% remaining in this group across time. Approximately 36% and 30% of students remained in the troubled and vulnerable groups across time, respectively. These findings were limited by the small cell size of some groups, as well as the use of convenience sampling, yet demonstrate the relative stability of mental health status within a DFM.

Compton (2016) also examined the longitudinal stability of group membership in a DFM, although her dissertation focused on early elementary school. The sample consisted of 2,604 K-2 students from 5 schools located in Washington and Arizona. Approximately half of the participants were female and approximately half received free or reduced-price lunch. Four waves of data were collected across one school year. SWB was measured using the Devereux Student Strengths Assessment Second Step® Edition, which assesses the social-emotional competencies that align with the social-emotional learning program Second Step®.

Psychopathology was measured using the SDQ. Group membership was determined using published norms for each measure, with participants with whole numbers closest to the 70th percentile on the SDQ classified as high in psychopathology and participants with whole numbers closest to the 30th percentile on the DESSA-SSE classified as high in SWB. Descriptive analyses were used to determine the percentage of students that changed quadrants. Results indicated that the flourishing and troubled groups were the most stable (86% and 61% remaining at Time 2, respectively), while the vulnerable group was the least stable (24% remaining at Time 2). The symptomatic but content group was moderately stable, with 44% of students remaining in this group at Time 2. Compton also identified five trajectories of mental health status: persistently troubled (low mental health across four time points), improving (low mental health that increased across time), declining (low mental health that decreased across time), persistently moderate (moderate mental health across time), and persistently flourishing (high mental health across time). The majority of students were considered persistently moderate and persistently flourishing (39.02% and 34.45%, respectively). Mental health status in a DFM therefore appears to demonstrate moderate stability during early elementary school as well as during adolescence.

In sum, group membership in a DFM appears to be modestly to moderately stable. The complete mental health group demonstrated the most stability during adolescence (Kelly et al., 2012; McMahan, 2012; Moore, 2018; Moore et al., 2019; Xiong et al., 2017), while the troubled group demonstrated the most stability during elementary school (Compton, 2016). The symptomatic but content group demonstrated moderate stability in the majority of studies, although this group was the least stable in McMahan's (2012) dissertation. The vulnerable and troubled groups demonstrated low to moderate stability. Students who changed mental health status tended to shift toward groups with higher SWB (Moore, 2018; Xiong et al., 2017),

although some results suggested that students in the vulnerable mental health group may transition to the troubled group over time (Xiong et al., 2017). A visual summary of research on the stability of a DFM is displayed in Table 2.

Mental Health and Academic Adjustment

Understanding the trajectory of students' mental health status during adolescence has important implications for outcomes related to mental health. Thus, in order to better understand how mental health status relates to students' academic performance and engagement, the following section reviews literature on the association between mental health and academic adjustment in youth. Studies conducted with elementary school students are reviewed first, followed by studies conducted with students in secondary school.

Mental Health and Academic Adjustment in Elementary School

Research on the relationship between mental health and students' academic adjustment in elementary school demonstrates a positive correlation between well-being and academic achievement (i.e., performance in class and on standardized assessments). For example, O'Connor et al. (2019) examined the relationship between positive mental health at school entry and academic achievement during mid-elementary. Their sample included 3,790 students (ages 8-9) and data were collected from the Longitudinal Study of Australian Children (LSAC) Birth cohort. Positive mental health was measured using the AEDC Mental Health Competence indicator and academic achievement was measured with a national standardized test that assessed reading, writing, language conventions, and numeracy. Findings revealed a significant positive relationship between positive mental health and numeracy ($\beta = 0.21$, $p < .05$), persuasive writing ($\beta = 0.19$, $p < .05$), reading ($\beta = 0.18$, $p < .05$), and spelling ($\beta = 0.18$, $p < .05$). While attrition

Table 2

Summary of Research Examining Stability of a Dual-Factor Model

Researchers	N	Sample age	How mental health groups defined	Time points	Primary results
Kelly, Hills, Huebner, & McQuillin (2012)	730	11-15 years old	Cut-scores (i.e., participants with *T*-score of 60 or higher on one or both subscales of SRCS [measure of psychopathology] considered high in psychopathology; participants with *T*-score of 40 or lower on SWB composite considered low in SWB)	2 time points, 5 months apart	Complete mental health most stable group (85% remaining at T2); vulnerable least stable (29% remaining at T2); symptomatic but content and troubled moderately stable (42% and 47%, respectively). Of students with high psychopathology, those with higher SWB more likely to move to complete mental health than those with low SWB.
Xiong, Qin, Gao, & Hai (2017)	531	Mean age = 14.65 (SD = 1.96)	Cut-scores (i.e., participants with *T*-scores at or above 67 for internalizing disorders and/or 60 for externalizing disorders classified as high in psychopathology; students above 30th percentile on SWB composite considered average-to-high in SWB based on % of youth considered high or low in psychopathology)	2 time points, 4 months apart	64.4% demonstrated no change in mental health status; complete mental health most stable group (80.2% remaining at T2); troubled least stable (34.5% remaining at T2). Students considered vulnerable at T1 most likely to transition to complete mental health (39.6%) and troubled (13.9%).
Moore, Dowdy, Nylund-Gibson, & Furlong (2019)	291	Grades 9-11	Latent profile analysis	3 time points, each 1 year apart	Majority of students demonstrated complete or moderate mental health across time; troubled group consistent over time; symptomatic but content group increased (from 20% at T1 to 31% at T3).

Table 2 (Continued)

Researchers	N	Sample age	How mental health groups defined	Time points	Primary results
Moore (2018)	875	Two cohorts (Grades 9-11; Grades 10-12)	Latent profile analysis	3 time points, each 1 year apart	Less than 24% remained in same group across all four years; complete mental health group most stable (10%), followed by the moderately mentally healthy group (9%); troubled group least stable (0.4%). Students whose mental health status changed across the three time points tended to move toward groups with higher well-being.
McMahan (2012)	425	Grades 9-11	Cut-scores (i.e., level of psychopathology based on published norms for the BASC-2; level of SWB based on sample-specific percentiles)	2 time points, 1 year apart	60% of students maintained same mental health status across time; complete mental health group most stable (80% remaining at T2); symptomatic but content group least stable (17% remaining at T2).
Compton (2016)	2,604	Grades K-2	Cut-scores (i.e., participants with whole numbers closest to 70th percentile on SDQ [measure of psychopathology] classified as high in psychopathology; participants with whole numbers closest to 30th percentile on DESSA-SSE [measure of SWB] classified as high in SWB)	4 time points, Fall and Spring of 2 consecutive school years	Troubled group most stable; vulnerable group least stable; symptomatic but content group moderately stable (44% remaining at T2. Identified five trajectories of mental health status: persistently troubled, improving, declining, persistently moderate, and persistently flourishing; majority of students persistently moderate and persistently flourishing (39.02% and 34.45%, respectively).

and the influence of unmeasured factors were potential limitations, the results suggest that mental health status is related to later academic performance during elementary school.

Yang et al. (2019) also investigated the relationship between academic achievement and positive mental health. Their study aimed to clarify the directionality of the relationship between subjective well-being and academic performance in a Chinese sample, given research suggesting that academic achievement predicts greater SWB. Data were gathered across three time points, with 779 students completing all three assessments. The mean age was 9.43 years and 52.9% of the participants were male. SWB was conceptualized as how students evaluate and emotionally experience their lives as they relate to school. This construct was measured using the Brief Adolescents' Subjective Well-being in School Scale. Academic achievement was measured by creating a summed score out of 100 for each academic course, which is a widely used technique for assessing Chinese students' academic performance (Yang et al., 2019). Results indicated that academic achievement positively predicted later SWB after controlling for autoregressive effects for both variables. These findings suggest that promoting academic achievement might help increase Chinese students' well-being. SWB was not found to predict academic achievement (Yang et al., 2019), although it is important to consider that variables often relate to life satisfaction differently in different cultures (Diener, 2000). For example, collectivist cultures tend to place the desires of the group above their own satisfaction, whereas individualist cultures emphasize the thoughts and feelings of individuals (Diener, 2000).

In their study on Habilidades para la Vida (Skills for Life), a school-based mental health program used in Chile, Murphy et al. (2015) found a significant relationship between elementary school students' mental health and later academic performance. The study's sample consisted of Chilean students who attended schools utilizing the Skills for Life program during first grade (*n*

= 37,397) and third grader (*n* = 18,969). Students' mental health risk was assessed using (1) the Teacher Observation of Classroom Adaptation-Revised-Chilean Version (TOCA-RR; George et al., 1994), which screens for students with aggressive-hyperactive, shy-oppositional, and inhibited-passive profiles using a 6-point Likert scale, and (2) the Pediatric Symptom Checklist-Chilean Version (PSC-CL; Jellinek et al., 1986), which measures students' overall psychological functioning. Academic performance was assessed using students' end-of-year GPAs and percentage of school days attended (Murphy et al., 2015). Multiple linear regression analyses indicated that both measures of mental health independently predicted students' academic performance in first and third grade. Further, students whose mental health improved over time demonstrated significant academic improvements compared to students who developed or consistently demonstrated mental health problems (Murphy et al., 2015). These findings align with those of O'Conner et al. (2019) and Yang et al. (2019), suggesting that mental health in elementary school is positively related to immediate and later academic performance.

Mental Health and Academic Adjustment in Secondary School

Several studies have explored the relationship between students' mental health status and academic adjustment in early and middle adolescence. Lyons et al. (2013) used a dual-factor model of mental health to determine if middle school students' GPA and school engagement differed across a 5-month period based on students' mental health status. At Time 1, the archival data set consisted of 1,390 seventh grade students and 419 eighth grade students (*M* = 12.71 years, *SD* = 0.68 years). Fifty-two percent of the sample was female, 60% was White, and 23% were eligible for free or reduced-price lunch. The final sample at Time 2 included 359 seventh grade students and 368 eighth grade students. Life satisfaction was measured using the SLSS (Huebner, 1991) and positive and negative affect were measured using the PANAS-C (Laurent et

al., 1999). Internalizing and externalizing symptoms were measured with the SRCS (Causey & Dubow, 1992). Behavioral engagement was measured using the Behavioral Engagement subscale of the School Engagement Scale (Fredricks et al., 2005) and cognitive engagement was measured using the Future Goals and Aspirations Subscale of the Student Engagement Instrument (SEI; Appleton et al., 2006). Emotional engagement was measured using the School Satisfaction subscale of the MSLSS (Huebner, 1994) and GPA was pulled from school records (Lyons et al., 2013).

Findings indicated that students in the positive mental health group had the highest GPAs and student engagement across all three indicators five months later (Lyons et al., 2013). GPA for the vulnerable group declined faster than GPA for the positive mental health group (parameter estimate = -0.14). While the positive mental health and symptomatic but content groups demonstrated slight increases in emotional engagement from Time 1 to Time 2, both the vulnerable and troubled groups demonstrated a significantly steep decrease over time (parameter estimate = -0.68 and -0.28, respectively, when compared to the positive mental health group). Behavioral engagement tended to decrease over time, with statistically significant differences between the slopes of the positive mental health and symptomatic but content groups. Lastly, cognitive engagement did not differ significantly across time, although negative mean differences were observed between the positive mental health and vulnerable groups (parameter estimate = -0.18), and the troubled group demonstrated a significantly steeper decrease compared to the positive mental health group (parameter estimate = -0.13). While limited by a relatively homogeneous sample and a short period between time points, these findings suggest that there is a relationship between students' mental health status and later academic adjustment.

In addition to examining the prevalence of mental health groups in a sample of adolescents, Suldo et al. (2016) examined academic outcomes as they relate to mental health status within a DFM. They hypothesized that students with complete mental health would have better academic outcomes than vulnerable students, while symptomatic but content students would have better outcomes than troubled students. Academic adjustment was measured using the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003), which assesses academic self-perceptions, valuing of school, and attitudes toward school. Results indicated that students with complete mental health had higher academic self-perceptions, better attitudes toward school, and were more likely to value school compared to vulnerable students ($p < .025$; small to moderate effects), while symptomatic but content students had more positive academic self-perceptions compared to troubled students ($p < .025$; moderate effect). Groups with higher psychopathology (i.e., symptomatic but content and troubled) had worse GPAs compared to the other two groups; however, GPA was unrelated to SWB level. A key limitation reported in the study was the cross-sectional design. Nonetheless, these findings suggest that both student engagement and academic performance are significantly related to group membership in a DFM during adolescence.

Moore et al. (2019) also investigated academic outcomes in their study on the stability of a DFM in adolescents. Mental health status was assessed during Grades 9-11. Later academic performance was measured during Grade 12 with a single question: "*During the past 12 months, how would you describe the grades you mostly received in school"*? Students responded using an 8-point scale (1= *mostly F's,* 8 = *mostly A's*). Relevant findings indicated that students in the complete mental health and moderately mentally healthy groups during Grades 10 and 11 reported higher grades compared to the symptomatic but content group. These findings align

with those of Lyons et al. (2013) and Suldo et al. (2016), suggesting that mental health status during middle adolescence is positively related to both immediate and distal academic outcomes.

Conclusions and Future Directions

In summary, several studies have demonstrated the usefulness of using a dual-factor model, which includes both positive and negative measures of mental health, to conceptualize mental health during middle adolescence (Lyons et al., 2012; Rose et al., 2017; Suldo et al., 2016). These studies yielded four distinct mental health groups, including two overlooked by the traditional model of mental health (i.e., symptomatic but content and vulnerable). Several studies have explored the stability of mental health status within a DFM, indicating that group membership is modestly to moderately stable, with some movement across groups. The complete mental health group appears to be the largest and most stable, with larger percentages of students remaining in this quadrant across time. Research on the relationship between mental health and academic adjustment during elementary school suggests that positive mental health is associated with higher academic performance. Similarly, research framed by a dual-factor model of mental health suggests that group membership is related to and predicts academic functioning, with higher SWB and lower psychopathology associated with positive academic adjustment.

While the above findings demonstrate the need for a comprehensive model of mental health, there are still several gaps in the literature. Namely, the stability of a DFM in adolescents has yet to be examined across three time points with groups defined using a clinically meaningful cut-score approach to classification. Additionally, while the literature has identified trends in change across groups, research has yet to explicitly address whether change in group membership is due to changes psychopathology, subjective well-being, or both. Finally, while research has found a relationship between mental health status and both immediate and delayed

academic outcomes, studies have yet to examine changes in student engagement and academic performance across multiple time points. The current study aimed to address these gaps in the literature with a longitudinal design investigating middle adolescents' mental health status yielded by a dual-factor model across three time points separated by 9 to 12 months. The relationship between mental health status and immediate and delayed academic adjustment, including both academic achievement and student engagement, also was examined.

CHAPTER THREE:

METHODS

This study investigated the stability of a dual-factor model of mental health in 9th and 10th grade high school students and examined the relationship between mental health status and academic outcomes. This chapter explains the methods that were used to address these research goals. First, the study's research design and sample are presented. Next, data collection procedures and analyses are described. Lastly, ethical considerations are discussed.

Research Design

This study used a longitudinal non-experimental design to determine the stability of mental health groups, as well as the relationship between mental health and academic outcomes. A non-experimental study aims to gather data on the relationship between naturally occurring variables. In this study, there was not any manipulation of the independent variables of interest (i.e., time and mental health status) and no random assignment to mental health groups, although statistical controls were introduced to control for nesting within school programs. Further, this study used archival data from a larger Institute of Education Science (IES; R305A150543) project's Year 3 and Year 4 data collection, making it a secondary data analysis. The current author is an approved member of the project's research team. The Principal Investigator received approval from USF IRB for all study procedures at the start of the project (IRB# Pro00022787; see Appendix A), as well as at the beginning and end of each subsequent year of the study.

Procedures

Setting

The dataset included three waves of data collected 9 to 12 months apart: Time 1 data collection occurred in August 2017, Time 2 data were collected in April 2018, and Time 3 data were collected in April 2019. These time points followed the same participants from grant R305A150543 awarded to Drs. Shannon Suldo and Elizabeth Shaunessy-Dedrick at the University of South Florida (USF). A total of 15 academic programs (from 14 schools) participated at all three data points. The schools were from three large districts in the Southeastern United States. Each public school offered AP courses and about half offered the IBD program.

Participants

The sample consisted of 9th grade students enrolled in AP or IBD classes in the three school districts who were followed into 10th grade. Participants had written parent consent and student assent to participate in a larger IES (R305A150543) project's Year 3 and Year 4 data collection. The project received USF IRB approval as well as approval from the school districts. At the AP school sites, only AP students who were not also enrolled in the IBD program were selected to participate.

Students completed a packet of questionnaires at three time points (9th grade fall, August 2017; 9th grade spring, April 2018; and 10th grade spring, April 2019). A total of 533 students completed the questionnaires at Time 1. Of the 533 students, 499 students also completed the questionnaires at Time 2. Of these, 328 students also completed the questionnaires at Time 3. The smaller sample sizes at Time 2 and Time 3 partially reflect students who were omitted based on incomplete questionnaires, as well as some attrition due to students moving out of the districts

or state or withdrawing from AP courses or the IBD program. Most frequently, however, attrition at Time 3 appeared to be related to differences in school participation (i.e., affected by the school administrator charged with recruiting participants) and less so due to student-specific features (e.g., enrollment in AP courses or the IBD program).

The demographic features of the sample at each time point are summarized in Table 3. Socioeconomic status was measured by standardizing and averaging three variables: eligibility for free or reduced-price school lunch (used to indicate economic disadvantage), highest education level completed by father, and highest education level completed by mother (i.e., 8th grade or less, some high school, high school completion, some college, college degree, or graduate degree). Gifted status was collected from school records. In the state of Florida, gifted status refers to students who have been identified as having "superior intellectual development and are capable of high performance" (Florida Department of Education, 2020).

Since the current study utilized archival data from a larger IES project that funded the development of a multi-tiered system of support focusing on 9th grade students in accelerated curricula, a subset of participants received additional supports that should be noted. Specifically, approximately 64% of students participated in the Advancing Coping and Engagement (ACE) program. The ACE program is a universal class-wide SEL curricula that uses didactic modules to build AP/IB students' ability to respond to academic stressors with effective coping styles and proactive school engagement. A minority of students who participated in the ACE program and later reported or showed signs of academic or emotional risk also were invited to participate in one to two individual Motivation, Assessment, and Planning (MAP) meetings with a mental health professional, during which students can reflect on and develop healthy coping skills and engagement practices.

Table 3

Students' Demographic Characteristics at Times 1, 2, and 3

Characteristic	Time 1 (N = 533) %	Time 2 (N = 499) %	Time 3 (N = 328) %
Gender			
Female	63.41	62.12	65.85
Male	36.59	37.88	34.15
Race/Ethnicity			
White	45.97	46.29	43.29
Black	7.13	6.81	6.71
Hispanic	21.39	20.84	22.56
Asian	11.26	12.02	14.63
Multi-racial	14.26	14.03	12.80
SES (mean composite)	-0.002	0.008	0.005
Gifted Status	31.89	32.26	35.98

Note. SES=socioeconomic status.

Attrition analyses were conducted to see if participants who completed mental health questionnaires at Time 1 only, Times 1 and 2 only, and Times 1, 2 and 3 differed significantly in terms of gender, race/ethnicity, SES, gifted status, or Time 1 mental health status. An ANOVA indicated that the three groups did not differ significantly in terms of SES status, F (2, N = 533) = 1.44, p = .24. Chi-square tests for independence indicated that the three groups differed significantly in terms of gender, χ^2 (2, N = 533) = 11.35, p = .003, race/ethnicity, χ^2 (8, N = 533) = 16.76, p = .03, gifted status, χ^2 (2, N = 533) = 6.63, p = .04, and Time 1 mental health status, χ^2 (6, N = 533) = 22.52, p = .001.

For gender, follow-up tests indicated that females left the study at a higher rate than males between Times 1 and 2, χ^2 (1, N = 205) = 8.83, p = .003, while males left the study at a higher rate between Times 2 and 3, χ^2 (1, N = 499) = 5.66, p = .02. Students who completed the questionnaires at Time 1 only did not differ significantly from those who completed the questionnaires at all three time points with regard to gender, χ^2 (1, N = 362) = 3.82, p = .051. For race/ethnicity, follow-up tests indicated that students who completed the questionnaires at Time

1 only did not differ significantly from those who completed the questionnaires at Times 1 and 2 only, χ^2 (4, N = 205) = 5.95, p = .20; however, between Time 2 and Time 3, participants who identified as White, Asian, or multiracial appeared to leave the study at higher rates than those who identified as Black or Hispanic, χ^2 (4, N = 499) = 9.68, p = .046. For gifted status, follow-up tests indicated that students who completed the questionnaires at Time 1 did not differ significantly from those who completed the questionnaires at Times 1 and 2, χ^2 (1, N = 202) = 0.006, p = .94. Conversely, students who were identified as gifted left the study at a lower rate between Times 2 and 3 than those who were not identified as gifted, χ^2 (1, N = 499) = 6.03, p = .01. Lastly, for Time 1 mental health status, follow-up tests indicated that students in the troubled or vulnerable groups left the study at higher rates than those in the complete mental health or symptomatic but content groups, specifically between Times 1 and 2, χ^2 (3, N = 205) = 13.28, p = .004. Students who completed the questionnaires at Times 1 and 2 did not differ significantly on Time 1 mental health status from those who completed the questionnaire at all three time points, χ^2 (3, N = 499) = 3.89, p = .27.

Data Collection

This study analyzed archival data. Parent and student assent were obtained twice: once at Times 1 and 2 and a second time at Time 3 (see Appendices A and B). At Time 1, teachers distributed a consent form explaining the purpose (i.e., to understand students' current school experiences in the context of a randomized control trial to examine the newly developed ACE and MAP interventions) and research activities to all 9th grade students in either AP Human Geography or IB Inquiry Skills at each school. At Time 3, all students who remained enrolled in one of the 14 schools and returned consent and assent forms at Time 1 were invited to participate in a longitudinal follow-up study. Students were informed that their responses would be kept

confidential and participation was voluntary. Students also received incentives for returning the signed parent consent form (e.g., inclusion in drawings for a $25 gift card) and completion of the packet of questionnaires (e.g., $10 movie pass to a local theater or iTunes gift cards for each student). Assent forms needed to be signed and returned for students to complete the packet of questionnaires, which included the measures that were analyzed in this study, as well as other measures related to the larger IES grant. Demographic data were collected only at Time 1. Measures were arranged in four different orders and versions were randomly assigned to students to reduce order effects.

Students with parent consent and student assent were assembled in a large space (e.g., an auditorium, the cafeteria) at each school or met in their classrooms during a common class time to complete the packet. Students completed practice questions that were similar in format to other items within the packet and then completed all surveys in counterbalanced order to control for possible order effects. The research team monitored students to ensure they responded independently and answered student questions with standard responses. When a survey packet was completed, one member from the research team visually inspected each scale in the packet to ensure that all items were complete and to check for errors in responding. Students were asked to complete or correct item(s) if necessary. USF researchers then scanned the surveys into a secure database and checked the data for accuracy. Academic performance data were obtained from each school's district at Time 2 and Time 3. Given that Time 1 occurred at the start of the 9th grade school year, and therefore does not reflect students' performance in high school level courses, only academic performance data from Times 2 and 3 (collected at the end of 9th and 10th grade, respectively) were used in the current study. The current author assisted with participant recruitment and data entry at Time 3.

Measures

A summary of the variables that were examined is presented in Table 4.

Demographics Form. The demographics form included questions on students' age, gender, race/ethnicity, parental marital status, and parental education level (see Appendix C). Each item provided multiple choice response options.

Brief Problem Monitor-Youth (BPM-Y). The BPM-Y form of the ASEBA (Achenbach et al., 2011) measures internalizing, externalizing, and attention problems in 11- to 18-year-old youth. Students are asked to rate each of the 19 items based on how it describes them at the time of the survey or within the past 6 months, using a scale ranging from 0 (*not true*) to 2 (*very true*). *T*-scores ≥ 65 (93rd percentile for normative samples) are considered "sufficiently elevated to be of concern" (i.e., high psychopathology; Achenbach et al., 2017). *T*-scores < 65 are considered in the normal range (i.e., low psychopathology). A review of norms purchased from the test developer (ASEBA) indicates gender-specific points indicative of elevated problems. On the internalizing scale, for males, a raw score of 5 corresponds to a *T*-score of 65 and indicates high internalizing problems. For females, a raw score of 7 corresponds to a *T*-score of 67 and indicates high internalizing problems. A raw score of 6 for females on the internalizing scale corresponds to a *T*-score of 63 and therefore is considered in the normal range. On the externalizing scale, a raw score of 7 corresponds to a *T*-score of 66 and indicates high externalizing problems for both males and females. A raw score of 6 on the externalizing scale corresponds to a *T*-score of 63 and therefore is considered in the normal range for both males and females. Achenbach et al. (2017) reported high test-retest reliability for the internalizing and

Table 4

Summary of Study Variables

Variable	Constitutive Definition	Operational Definition
Psychopathology	Internalizing problems (anxiety, depression, somatic complaints, and withdrawal) and externalizing problems (aggressive behavior and delinquent behavior)	ASEBA BPM-Y (Internalizing and Externalizing scales)
Subjective well-being		
Life satisfaction	Perceptions that one's life is going well	SLSS Composite
Positive affect	How frequently one experiences positive emotions	PANAS-C-10 (PA)
Negative affect	How frequently one experiences negative emotions	PANAS-C-10 (NA)
Academic adjustment		
Performance in classes	GPA calculated by assigning numerical values to letter grades earned during school year of interest and dividing by the total number of classes attempted	School records
Student engagement		
Behavioral	On-task behavior, effort, and attention in the classroom	EVD (BE scale)
Affective	Belongingness reflected by pride in school and feelings of respect by and attachment to teachers	ISQ (Belonging scale)
Cognitive	Efforts to maintain goal-directed academic behavior through strategizing and persistence	SAAS-R (SR scale)

Note. ASEBA=Achenbach System of Empirically Based Assessment. BPM-Y=Brief Problem Monitor-Youth. SLSS=Students' Life Satisfaction Scale. PANAS-C=Positive and Negative Affect Scale for Children. PA=Positive Affect. NA=Negative Affect. EVD=Engagement versus Disaffection. BE=Behavioral Engagement. ISQ=Identification with School Questionnaire. SAAS-R= School Attitude Assessment Survey-Revised. SR=Self-Regulation.

externalizing scales of the BPM-Y (r = .80 and .85, respectively), as well as acceptable internal consistency (α = .78 and .75, respectively). Both internalizing and externalizing scales also demonstrated acceptable internal consistency in a sample of middle school students (α = .82-.88 and .74-.82, respectively; Roth et al., 2017).

Students' Life Satisfaction Scale (SLSS). The SLSS (Huebner, 1991) measures general life satisfaction in students from grade 3 to 12 (see Appendix D). The scale consists of 7 items that ask students to indicate their level of agreement with statements about quality of life (e.g., "My life is just right," "I wish I had a different kind of life") on a scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher mean scores indicate higher levels of global life satisfaction. Huebner (1991) reported high internal consistency for the SLSS (coefficient alpha = .82) and high test-retest reliability (r = .74 and r = .68). Suldo et al. (2016) and Lyons et al. (2012) also reported strong psychometric properties of the SLSS based on high school samples, with Cronbach's alphas of .88 and .81, respectively.

10-Item Positive and Negative Affect Scale for Children (PANAS-C-10). The PANAS-C-10 (Ebesutani et al., 2012) is a shortened version of the PANAS-C (Laurent et al., 1999) and measures the frequency of positive and negative emotions in youth (see Appendix E). It consists of 5 items that measure the frequency of positive affect (e.g., interested, excited) and 5 items that measure the frequency of negative affect (e.g., gloomy, lonely). Participants rate moods or feelings on a Likert scale ranging from 1 (*very slightly* or *not at all*) to 5 (*extremely*) based on the extent to which they experienced each in the past few weeks. Laurent et al. (1999) reported support for high internal consistency for the PANAS-C (alpha coefficient = .92 for NA scale, alpha coefficient =.89 for PA scale), as well as strong construct validity based on the magnitude and direction of relationships with anxiety and depression (for PA, r = -.30 and -.55,

respectively; for NA, *r* = .68 and .60, respectively). Ebesutani et al. (2012) reported strong psychometric properties of the PANAS-C-10, with a Cronbach's alpha of .86 for PA and .82 for NA.

School records. Grade point averages (GPA) and students' gifted status were gathered from school records. As mentioned above, students are classified as gifted if they have been identified as having "superior intellectual development and are capable of high performance" (Florida Department of Education, 2020). GPA reflects students' average final grades earned in all 9th grade classes (gathered at Time 2) and 10th grade classes (gathered at Time 3). Each school's district sent the research team students' transcripts with their grades in each course. GPA was calculated by adding numerical values to letter grades (e.g., A = 4.0, B = 3.0) and dividing by the total number of attempted credit hours. Since students were enrolled in advanced coursework, a weighting procedure was employed that resulted in some GPA values that exceed 4.0. Specifically, grades earned in honors classes were awarded an additional half point (e.g., A = 4.5, B = 3.5) and grades earned in AP and IBD courses were awarded an additional whole point (e.g., A = 5.0); however, this weighting procedure was not considered in the current study. A grade of F received zero points in all courses.

Engagement vs. Disaffection (EVD). The EVD scale (Skinner et al., 2009) is designed to measure students' school engagement. The complete measure contains 20 items that assess four subscales: behavioral engagement, behavioral disaffection, emotional engagement, and emotional disaffection (see Appendix F). To assess behavioral engagement, the current study utilized the behavioral engagement (BE) subscale, which includes five items that assess students' on-task behavior, effort, and attention in the classroom (e.g., "When I'm in class, I participate in class discussions"). In terms of convergent validity, scores on the BE scale yields significant,

moderate correlations with teacher ratings of students' behavioral engagement (Cohen's *d* = .32-.37; Skinner et al., 2009). Skinner et al. (2009) also report strong internal consistency (alpha coefficient = .61-.72). Among a teenage sample, higher scores were significantly correlated with better academic achievement (alpha coefficients = .74; King & Gaerlan, 2014.)

Identification with School Questionnaire (ISQ). The complete ISQ (Voelkl, 1996) contains 16 items and measures students' valuing of school and their feelings of belonging at school. To index affective engagement, the current study utilized only the nine items measuring students' belonging, reflected by pride in school and feelings of respect by and attachment to teachers (see Appendix G). Voelkl (1996) reported high internal consistency (alpha coefficient = .76), as well as evidence from confirmatory factor analysis for construct validity of both scales. A study conducted with high school students also reported high internal consistency (alpha coefficient = .75; Bos et al., 2008).

School Attitude Assessment Survey-Revised (SAAS-R). The SAAS-R (McCoach & Siegle, 2003) is designed to measure students' beliefs related to school. The complete measure contains 35 items that assess five subscales: academic self-perceptions, attitudes towards teachers, motivation and self-regulation, valuing of school, and attitude toward school. Students indicate their agreement with each item using a Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). To index cognitive engagement, this study utilized only the self-regulation (SR) subscale, which assesses students' efforts to maintain goal-directed academic behavior through strategizing and persistence (see Appendix H). Prior research with high school students provides support for convergent validity (Suldo et al., 2008). Specifically, motivation and self-regulation was highly correlated with academic self-efficacy (*r* = .68) and demonstrated a significant, negative association with school-conduct problems (*r* = -.19).

Research Questions

The research questions that were answered in this study are as follows:

1. To what extent is group membership in the four quadrants of a dual-factor model of mental health stable across 3 time points, each 9-12 months apart, for high school students enrolled in accelerated curricula?
    a. What percent of students are in each quadrant at each time point?
    b. What percent of students are in the same quadrant for 2 or 3 time points?
2. Assuming 1b is <100%, is change in group membership due to change in psychopathology, subjective well-being, or both for high school students enrolled in accelerated curricula?
3. For high school students enrolled in accelerated curricula, what is the relationship between group membership at Time 1 and:
    a. Students' academic performance at Times 2 and 3?
    b. Student engagement at Times 1, 2, and 3?

Overview of Data Analysis

Prior to performing data analysis, descriptive statistics were calculated for each variable and data were screened for missing items and outliers using Statistical Analysis Software (SAS). No tests were run to address missing participant data due to the nature of the research questions, which look at change across time. Instead, only data from students who completed all mental health surveys at all three time points were included in analyses for the three primary research questions. Alpha coefficients were calculated for each scale at each time point to provide information on the reliability of each measure. An alpha coefficient of .70 or above indicates adequate internal consistency (Nunnally, 1978). Lastly, a SWB composite variable was

calculated, and reliability was examined by calculating the correlation between each contributing variable. The relevant variables and data analysis plans for each question are described below.

Stability of Mental Health in a Dual-Factor Model (Question 1)

The independent variable was time, measured across three time points (9th grade fall, August 2017; 9th grade spring, April 2018; 10th grade spring, April 2019). The dependent variable was students' group membership in a dual-factor model of mental health (troubled, vulnerable, symptomatic but content, or complete mental health). Students' group membership was determined using cut-scores. Level of psychopathology was defined according to published norms from ASEBA, with *T*-scores ≥ 65 (93rd percentile) on symptoms of internalizing and/or externalizing disorders indicating an elevated level of psychopathology. The remaining students were classified as low psychopathology, as reflected in a lack of clinically elevated level of psychopathology. Since norms for SWB have not been developed, cut-points for average-to-high and low SWB corresponded with the proportion of students classified as having high or low psychopathology, as done in previous research (Suldo & Shaffer, 2008). Specifically, an SWB composite variable was calculated by adding together *z*-scores for life satisfaction and positive affect and then subtracting negative affect scores. Cut-points for students considered average-to-high in SWB were based on the percentile of students with elevated psychopathology at each time point. For example, if 30% of the sample was identified with elevated psychopathology at Time 1, then students above the 30th percentile on SWB were classified as average-to-high in SWB for this time point. The same procedure was used at Time 2 and Time 3 based on the percentiles of students with elevated psychopathology at these time points.

After participants were assigned to one of the four mental health quadrants at Time 1, Time 2, and Time 3, descriptive analyses were used to summarize the number of students in each

mental health group at Times 1, 2, and 3. McNemar tests were used to determine if the proportion of students in a particular group increased or decreased over time. Then, descriptive analyses were used to summarize the number of students on each of the 64 possible mental health trajectory paths. Commonalities were examined using the proportion of students who remained in the same group over time and the proportion of students that changed groups at least once.

Change in Psychopathology Versus Change in SWB (Question 2)

The independent variable was time, measured across three time points (9th grade fall, August 2017; 9th grade spring, April 2018; 10th grade spring, April 2019). The dependent variables were psychopathology (elevated or low) and SWB (average-to-high or low). Students who changed mental health groups over time were sorted into three change categories: change in level of psychopathology only, change in level of SWB only, and change in both psychopathology and SWB. Chi-square tests for goodness of fit were used to determine if the proportions of students with changes in psychopathology only, changes in SWB only, and changes in both psychopathology and SWB were significantly different. The relative deviation of each type of change from the expected proportion was examined to determine how each change category contributed to the chi-square statistic.

Relationship Between Mental Health Status at Time 1 and Academic Adjustment Across Time (Question 3).

Hierarchical linear modeling was used to account for the nesting of students within 15 different school programs, due to the shared variance resulting from shared teachers, curriculums, and grading procedures. Eleven models including both individual and school program-level predictors were run to determine the degree to which students' group membership

in a DFM at Time 1 predicted (1) academic performance at Times 2 and 3 and (2) student engagement (i.e., behavioral engagement, affective engagement, and cognitive engagement) at Times 1, 2, and 3, while also controlling for intervention group (i.e., participation in the ACE intervention). The eleven multilevel equations are listed below, with the complete mental health group serving as the reference group.

For all equations:

Level 1: $\text{Dependent variable}_{ij} = \beta_0 + \beta_1 \text{ Troubled} + \beta_2 \text{ Symptomatic} + \beta_3 \text{ Vulnerable} + e_{ij}$

Level 2: $\beta_0 = Y_{00} + Y_{01} \text{ Intervention} + u_0$

$\beta_1 = Y_{10}$

$\beta_2 = Y_{20}$

$\beta_3 = Y_{30}$

GPA as dependent variable:

$\text{T2 GPA}_{ij} = Y_{00} + Y_{01} \text{ Intervention} + u_0 + Y_{10} \text{ Troubled} + Y_{20} \text{ Symptomatic} +$

$Y_{30} \text{ Vulnerable} + e_{ij}$

$\text{T3 GPA}_{ij} = Y_{00} + Y_{01} \text{ Intervention} + u_0 + Y_{10} \text{ Troubled} + Y_{20} \text{ Symptomatic} +$

$Y_{30} \text{ Vulnerable} + e_{ij}$

Behavioral engagement as dependent variable:

$\text{T1 Behavioral}_{ij} = Y_{00} + Y_{01} \text{ Intervention} + u_0 + Y_{10} \text{ Troubled} + Y_{20} \text{ Symptomatic} +$

$Y_{30} \text{ Vulnerable} + e_{ij}$

$\text{T2 Behavioral}_{ij} = Y_{00} + Y_{01} \text{ Intervention} + u_0 + Y_{10} \text{ Troubled} + Y_{20} \text{ Symptomatic} +$

$Y_{30} \text{ Vulnerable} + e_{ij}$

$\text{T3 Behavioral}_{ij} = Y_{00} + Y_{01} \text{ Intervention} + u_0 + Y_{10} \text{ Troubled} + Y_{20} \text{ Symptomatic} +$

$Y_{30} \text{ Vulnerable} + e_{ij}$

Affective engagement as dependent variable:

$$\text{T1 Affective}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

$$\text{T2 Affective}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

$$\text{T3 Affective}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

Cognitive engagement as dependent variable:

$$\text{T1 Cognitive}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

$$\text{T2 Cognitive}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

$$\text{T3 Cognitive}_{ij} = Y_{00} + Y_{01}\,\text{Intervention} + u_0 + Y_{10}\,\text{Troubled} + Y_{20}\,\text{Symptomatic} + Y_{30}\,\text{Vulnerable} + e_{ij}$$

Ethical Considerations

Several precautions were taken during initial data collection to ensure participants' safety and well-being. First, parent consent and student assent were required for participation in the larger study. Both forms noted that students could refuse to answer any questions that made them uncomfortable and could choose to stop their participation at any time. The forms also explained the confidentiality of students' responses, stating that responses would not be shared with school staff or anyone other than the research team. Second, any evidence of child abuse or neglect disclosed during completion of surveys was reported to authorities. If students wrote or said that they planned to harm someone or themselves, or their responses on surveys indicated extreme

emotional distress, this was reported to the school. Third, student responses were assigned a code number and placed in a locked filing cabinet. Records from the study will be destroyed in five years. It should also be noted that all surveys were written in English based on the assumption that students enrolled in accelerated programs conducted in English would be able to understand the survey questions.

CHAPTER FOUR:

RESULTS

This chapter reports the results of the analyses conducted to answer the study's three primary research questions. First, results from preliminary analyses are presented, including screening for missing data and outliers, and measure reliability. Then, results for each of the three primary research questions are presented.

Preliminary Analyses

Preliminary analyses included (1) assessing missing data, (2) calculating descriptive statistics for each variable and examining outliers, (3) calculating Cronbach's alpha, and (4) calculating the correlation between variables making up the SWB composite score.

Missing Data

Of the 533 students who completed the mental health questionnaires at Time 1, 499 students (93.6% return rate) also completed mental health questionnaires at Time 2, and 328 students (61.5% return rate for T1 sample; 65.7% for Time 2 sample) completed mental health questionnaires at all three time points. Two participants who completed the mental health questionnaires at Time 1 only had more than two missing items on the BPM-Y internalizing subscale and BPM-Y externalizing subscale, respectively. These participants were excluded from the Time 1 sample of 533 students, based on recommendations in the measure's manual. For the smaller sample of 328 participants, rates of missing data were low, with no participants missing more than 1 item on any scale and one participant missing GPA at Time 3. Thus, data from all 328 participants were used in analyses for the primary research questions, with all average and

sum scores reflective of items that were completed. The only exception was examination of the relationship between mental health status at Time 1 and GPA at Time 3, which used data from the 327 participants with GPA values.

Descriptive Statistics

Using the Time 3 sample of 328 participants, descriptive statistics were calculated for each variable at each time point. Results are displayed in Table 5. All variables except GPA had approximately normal distributions, defined by skewness and kurtosis values ranging from -1.5 to +1.5. Examination of each variable's distribution also confirmed that no impossible values were recorded during data entry. For GPA at Time 2, values ranged from a low of 1.30 to a high a 4.00, with a mean of 3.50 (*SD* = 0.56) and a median of 3.67. The distribution was negatively skewed (sk = -1.35) and leptokurtic (ku = 1.44). At Time 3, GPA values ranged from a low of 0.43 to a high a 4.00, with a mean of 3.46 (*SD* = 0.56) and a median of 3.63. The distribution again was negatively skewed (sk = -1.60) and leptokurtic (ku = 3.30). These distributions, which indicate that a majority of students had GPAs in the higher range, likely reflect participants' enrollment in accelerated courses. At Times 2 and 3, eight and eleven GPAs were identified as outliers, respectively. Outliers were included in data analyses as they fell within the range of possible GPA values and still represented those individuals' academic performance.

Measure Reliability

Cronbach's alpha was assessed for all scales at each time point to obtain information on the internal consistency of each measure. Results are reported in Table 6, with an alpha coefficient of .70 or above indicating adequate internal consistency (Nunnally, 1978). Observations with missing values were excluded, resulting in slightly smaller sample sizes.

Table 5

Descriptive Statistics for all Variables (N=328)

Variable	*M*	*SD*	Min	Max	*Sk*	*Ku*
		Time 1				
Psychopathology						
Internalizing Problems	3.93	3.14	0	12	0.76	-0.27
Externalizing Problems	2.47	2.04	0	9	0.75	-0.07
Subjective well-being						
Life satisfaction	4.34	0.94	1.43	6.00	-0.43	-0.31
Positive affect	3.34	0.88	1.00	5.00	-0.10	-0.56
Negative affect	1.99	0.80	1.00	4.80	1.09	0.83
Academic adjustment						
GPA	--	--	--	--	--	--
Behavioral engagement	3.46	0.42	2.00	4.00	-0.76	0.25
Affective engagement	2.95	0.45	1.33	4.00	-0.32	0.51
Cognitive engagement	5.57	0.95	1.80	7.00	-0.97	0.78
		Time 2				
Psychopathology						
Internalizing Problems	3.89	3.30	0	12	0.79	-0.20
Externalizing Problems	2.58	2.11	0	12	1.02	1.37
Subjective well-being						
Life satisfaction	4.38	0.89	1.00	6.00	-0.57	0.54
Positive affect	3.43	0.85	1.20	5.00	-0.19	-0.33
Negative affect	2.04	0.82	1.00	5.00	1.09	0.82
Academic adjustment						
GPA	3.50	0.56	1.30	4.00	-1.35	1.44
Behavioral engagement	3.38	0.48	1.60	4.00	-0.70	0.10
Affective engagement	2.92	0.44	1.44	3.89	-0.14	-0.27
Cognitive engagement	5.39	1.07	1.00	7.00	-0.92	0.86
		Time 3				
Psychopathology						
Internalizing Problems	4.57	3.48	0	12	0.41	-0.95
Externalizing Problems	2.50	2.11	0	9	0.75	-0.08
Subjective well-being						
Life satisfaction	4.24	0.98	1.14	6.00	-0.34	-0.35
Positive affect	3.20	0.91	1.00	5.00	0.09	-0.62
Negative affect	2.12	0.83	1.00	5.00	0.99	0.78
Academic adjustment						
GPA	3.46	0.56	0.43	4.00	-1.60	3.30
Behavioral engagement	3.30	0.52	1.20	4.00	-0.79	0.75
Affective engagement	2.83	0.48	1.44	4.00	-0.17	0.004
Cognitive engagement	5.25	1.13	1.60	7.00	-0.93	0.47

Note. M=mean. SD=standard deviation. Min=minimum value. Max=maximum value. Sk=skewness. Ku=Kurtosis.

The BPM-Y internalizing subscale demonstrated acceptable internal consistency with coefficient alphas ranging from .85-87 across time. The BPM-Y externalizing subscale demonstrated slightly weaker internal consistency, with coefficient alphas ranging from .65-72 across time. After reverse scoring items 3 and 4, the SLSS demonstrated acceptable internal consistency with coefficient alphas of .87-.89. The PANAS-C-10 positive and negative affect subscales also demonstrated acceptable internal consistency (α = .87-.90 and .78-.81, respectively).

All academic measures also demonstrated acceptable internal consistency. For the EVD behavioral engagement scale, coefficient alphas ranged from .74-.79. For the ISQ belonging scale, coefficient alphas ranged from .76-.82, and for the SAAS-R self-regulation scale, coefficient alphas ranged from .91-.92. Thus, alpha coefficients for all scales fell in the acceptable range for all three time points, with the exception of the BPM-Y Externalizing subscale at Time 1 (α = .65) and Time 3 (α = .66).

Table 6

Cronbach's Alpha for Measures in Study

Measure	Number of Items	Internal Consistency [α (n)]		
		Time 1	Time 2	Time 3
ASEBA BPM-Y (Internalizing)	6	.85 (326)	.86 (328)	.87 (328)
ASEBA BPM-Y (Externalizing)	7	.65 (326)	.72 (327)	.66 (323)
SLSS	7	.87 (326)	.87 (327)	.89 (328)
PANAS-C-10 (PA)	5	.87 (328)	.88 (327)	.90 (328)
PANAS-C-10 (NA)	5	.78 (327)	.79 (326)	.81 (328)
EVD (BE scale)	5	.74 (326)	.76 (328)	.79 (328)
ISQ (Belonging scale)	9	.78 (325)	.76 (325)	.82 (326)
SAAS-R (SR scale)	10	.91 (322)	.92 (325)	.92 (321)

Note. ASEBA=Achenbach System of Empirically Based Assessment. BPM-Y=Brief Problem Monitor-Youth. SLSS=Student Life Satisfaction Scale. PANAS-C=Positive and Negative Affect Scale for Children. PA=Positive Affect. NA=Negative Affect. EVD=Engagement versus Disaffection. BE=Behavioral Engagement. ISQ=Identification with School Questionnaire. SAAS-R= School Attitude Assessment Survey-Revised. SR=Self-Regulation.

SWB Composite

During preliminary analyses, a SWB composite variable was calculated by adding the *z*-scores for life satisfaction and positive affect and then subtracting the *z*-scores for negative affect. To examine the reliability of the composite variable, the correlation between each contributing variable was calculated at all three time points using the smaller sample size of 328 participants. As expected, there was a strong positive linear correlation between life satisfaction and positive affect *z*-scores at Time 1 ($r = .50$, $p < .0001$), Time 2 ($r = .56$, $p < .0001$), and Time 3 ($r = .54$, $p < .001$), and a strong negative linear correlation between life satisfaction and negative affect *z*-scores at Time 1 ($r = -.51$, $p < .0001$), Time 2 ($r = -.57$, $p < .0001$), and Time 3 ($r = -.56$, $p < .0001$). Similarly, there was a moderate negative linear correlation between positive affect and negative affect *z*-scores at all three time points (for Time 1, $r = -.34$, $p < .0001$; for Time 2, $r = -.40$, $p < .0001$; for Time 3, $r = -.35$, $p < .0001$).

Stability of Mental Health in a Dual-Factor Model (Question 1)

To examine the stability of high school students' mental health status across three time points, students' group membership at each time point was determined using cut-scores. Level of psychopathology was defined according to published norms from ASEBA, with *T*-scores ≥ 65 (93rd percentile) on symptoms of internalizing and/or externalizing disorders indicating an elevated level of psychopathology. The remaining students were classified as low psychopathology. After calculating an SWB composite variable (i.e., adding *z*-scores for life satisfaction and positive affect and then subtracting z negative affect *z*-scores), cut-points for students considered average-to-high in SWB were determined based on the percentile of students with high psychopathology at each time point, as done in previous research (Suldo & Shaffer, 2008).

The proportions of participants classified in each mental health group at Times 1, 2, and 3 are displayed in Table 7. At Time 1, 27.44% of the 328 students were classified as elevated psychopathology (81.11% for internalizing, 6.67% for externalizing, 12.22% for both internalizing and externalizing; see Table 8), leaving 72.56% participants classified as low psychopathology. Students above the 27.44th percentile on SWB therefore were classified as average-to-high in SWB for Time 1. Using these classifications, students were sorted into one of the four quadrants of a DFM of mental health: complete mental health (63.11% of students), symptomatic but content (9.45% of students), vulnerable (9.45% of students), and troubled (17.99% of students).

At Time 2, 26.83% of the 328 students were classified as elevated psychopathology (80.68% for internalizing, 11.36% for externalizing, 7.95% for both internalizing and externalizing; see Table 8), leaving 73.17% participants classified as low psychopathology. Students above the 26.83rd percentile on SWB therefore were classified as average-to-high in SWB for Time 2. As at Time 1, students then were sorted into one of the four possible mental health categories: complete mental health (62.20% of students), symptomatic but content (10.98% of students), vulnerable (10.98% of students), and troubled (15.85% of students).

At Time 3, 36.28% of the 328 students were classified as elevated psychopathology (85.71% for internalizing, 4.20% for externalizing, 10.08% for both internalizing and externalizing; see Table 8), leaving 63.72% participants classified as low psychopathology. Students above the 36.28th percentile on SWB therefore were classified as average-to-high in SWB for Time 3. Thus, 52.44% of students were classified as having complete mental health, 11.28% as symptomatic but content, 11.28% as vulnerable, and 25.00% as troubled.

Table 7

Proportion of Participants Classified in Each Mental Health Group at Times 1, 2, and 3

	Time 1 N (%)	Time 2 N (%)	Time 3 N (%)
Complete mental health	207 (63.11)	204 (62.20)	172 (52.44)
Symptomatic but content	31 (9.45)	36 (10.98)	37 (11.28)
Vulnerable	31 (9.45)	36 (10.98)	37 (11.28)
Troubled	59 (17.99)	52 (15.85)	82 (25.00)

Table 8

Elevated Symptom Domains of Participants with Elevated Psychopathology (T-score ≥ 65) at Times 1, 2, and 3

T-score ≥ 65	Time 1 N (%)	Time 2 N (%)	Time 3 N (%)
Internalizing only	73 (81.11)	71 (80.68)	102 (85.71)
Externalizing only	6 (6.67)	10 (11.36)	5 (4.20)
Internalizing and Externalizing	11 (12.22)	7 (7.95)	12 (10.08)

McNemar tests indicated that the proportion of students in the complete mental health group did not change significantly from Time 1 to Time 2 (p = .73) but did decrease significantly from Time 2 to Time 3 (p = .0006; difference in proportions = .0976). The proportion of students in both the symptomatic but content and vulnerable groups did not change significantly from Time 1 to Time 2 (p = .52 and .42, respectively) or from Time 2 to Time 3 (p = .89 and .89, respectively). While the proportion of students in the troubled group did not change significantly from Time 1 to Time 2 (p = .33), it did increase significantly from Time 2 to Time 3 (p = .0003; difference in proportions = .0915).

Next, descriptive analyses were used to examine the number of students on each of the 64 possible mental health trajectories. Results are displayed in Figures 1-4. While 52.74% (n = 173) of students changed mental health groups across two or three time points (95% confidence interval = 0.47, 0.58), 47.26% (n = 155) of students remained in the same group for Times 1, 2,

and 3. Specifically, 37.80% (n = 124) fell in the complete mental health group for all three time points, 0.61% (n = 2) fell in the symptomatic but content for all three time points, 1.22% (n = 4) fell in the vulnerable group for all three time points, and 7.62% (n = 25) fell in the troubled group for all three time points.

Change in Psychopathology Versus Change in SWB (Question 2)

To examine whether changes in group membership were due to changes in psychopathology, SWB, or both, analyses were conducted using the 52.74% of students who changed mental health groups over time (n = 173). First, students who changed mental health groups over time were sorted into three change categories: change in level of psychopathology only, change in level of SWB only, and change in both psychopathology and SWB (Table 9). Of students who changed mental health groups over time, 28.32% of changes were due to changes in psychopathology only, 27.01% of changes were due to changes in SWB only, and 45.66% of changes were due to changes in both psychopathology and SWB.

Table 9

Proportion of Participants Who Demonstrated Each Type of Change Over Time (Change in Psychopathology Only, Change in SWB only, or Change in Both Psychopathology and SWB)

Change Type	Proportion of Participants [N (%)]
Psychopathology Only	49 (28.32)
SWB Only	45 (26.01)
Psychopathology and SWB	79 (45.66)

Chi-square tests for goodness of fit indicated that the observed proportions of students with changes in psychopathology only, changes in SWB only, and changes in both psychopathology and SWB were significantly different from the expected proportions of 33.33% for each group, χ^2 (2, N = 173) = 11.98, p = .003. Examination of the relative deviation of each

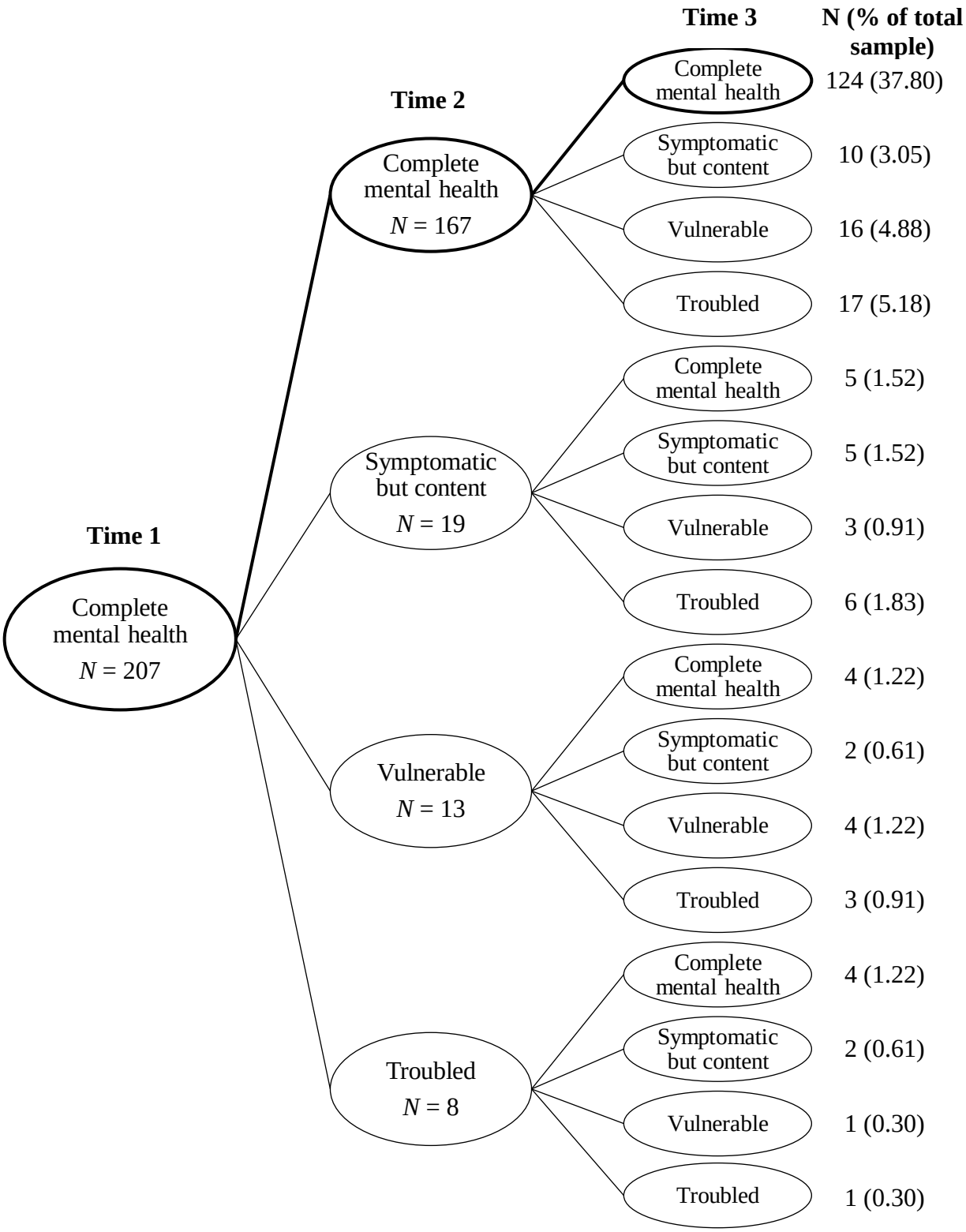

Figure 1. Mental health trajectories for participants starting in complete mental health group.*

**Pathway representing students who remained in the same group over time is in bold.*

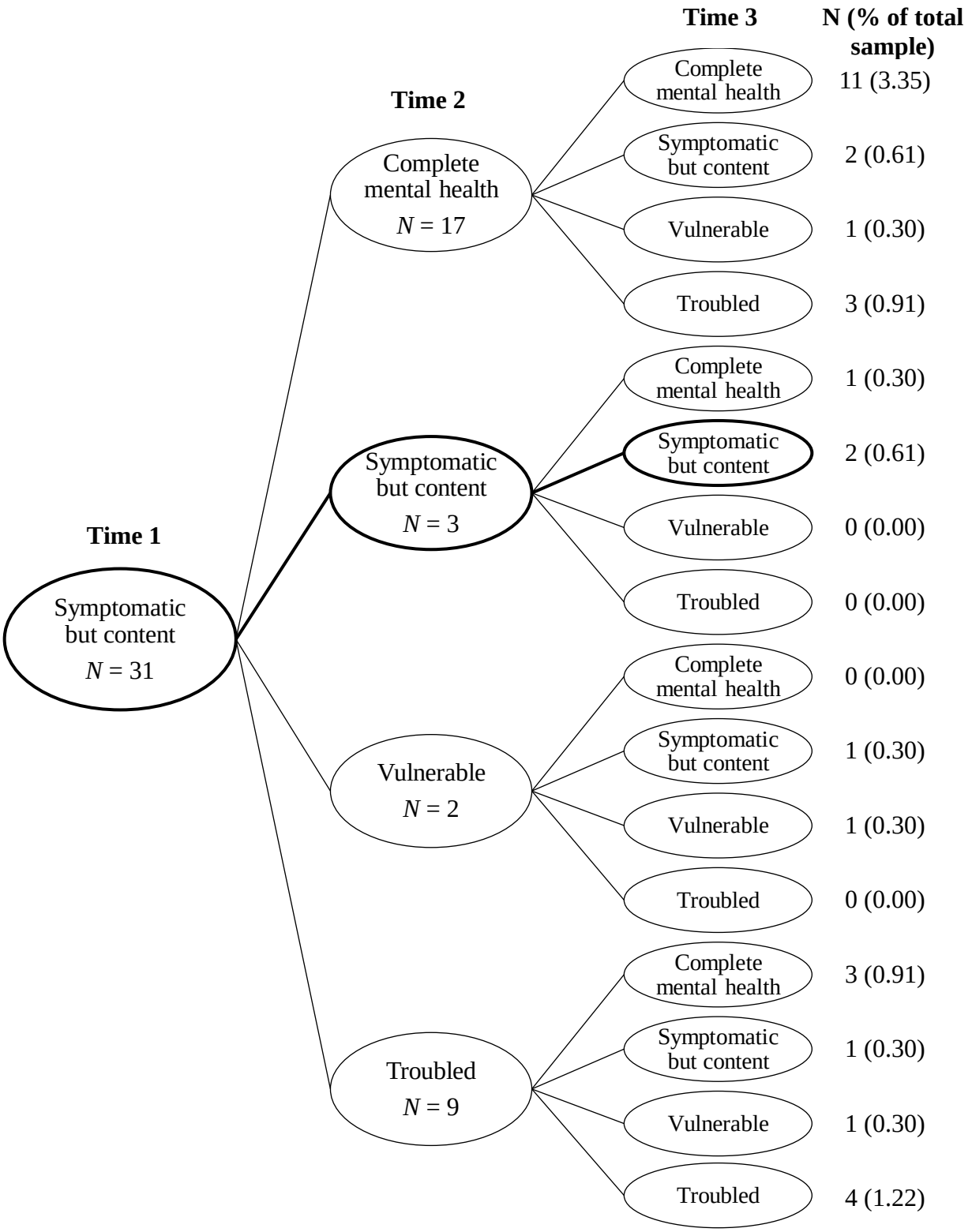

Figure 2. Mental health trajectories for participants starting in symptomatic but content group.*

**Pathway representing students who remained in the same group over time is in bold.*

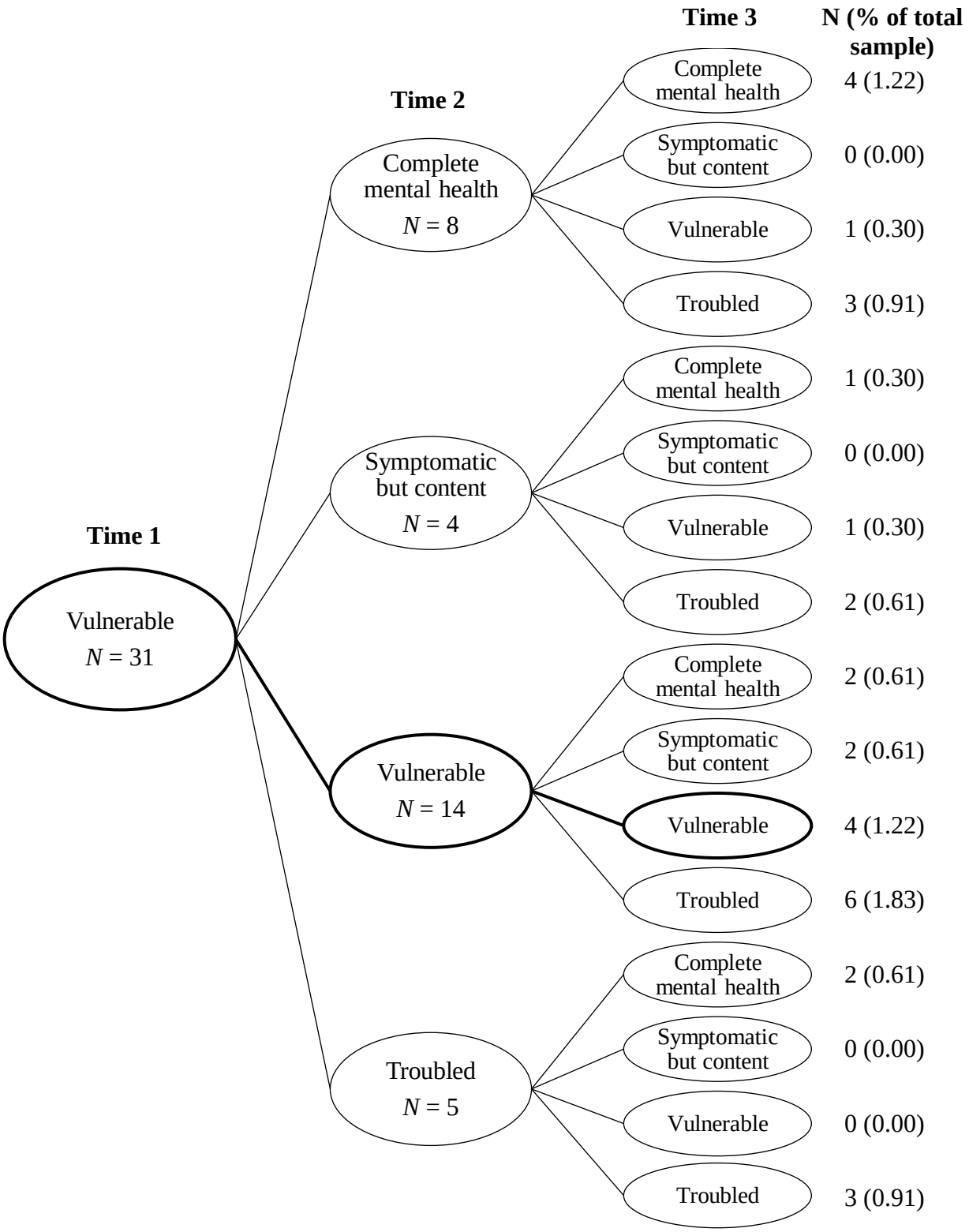

Figure 3. Mental health trajectories for participants starting in vulnerable group.*

**Pathway representing students who remained in the same group over time is in bold.*

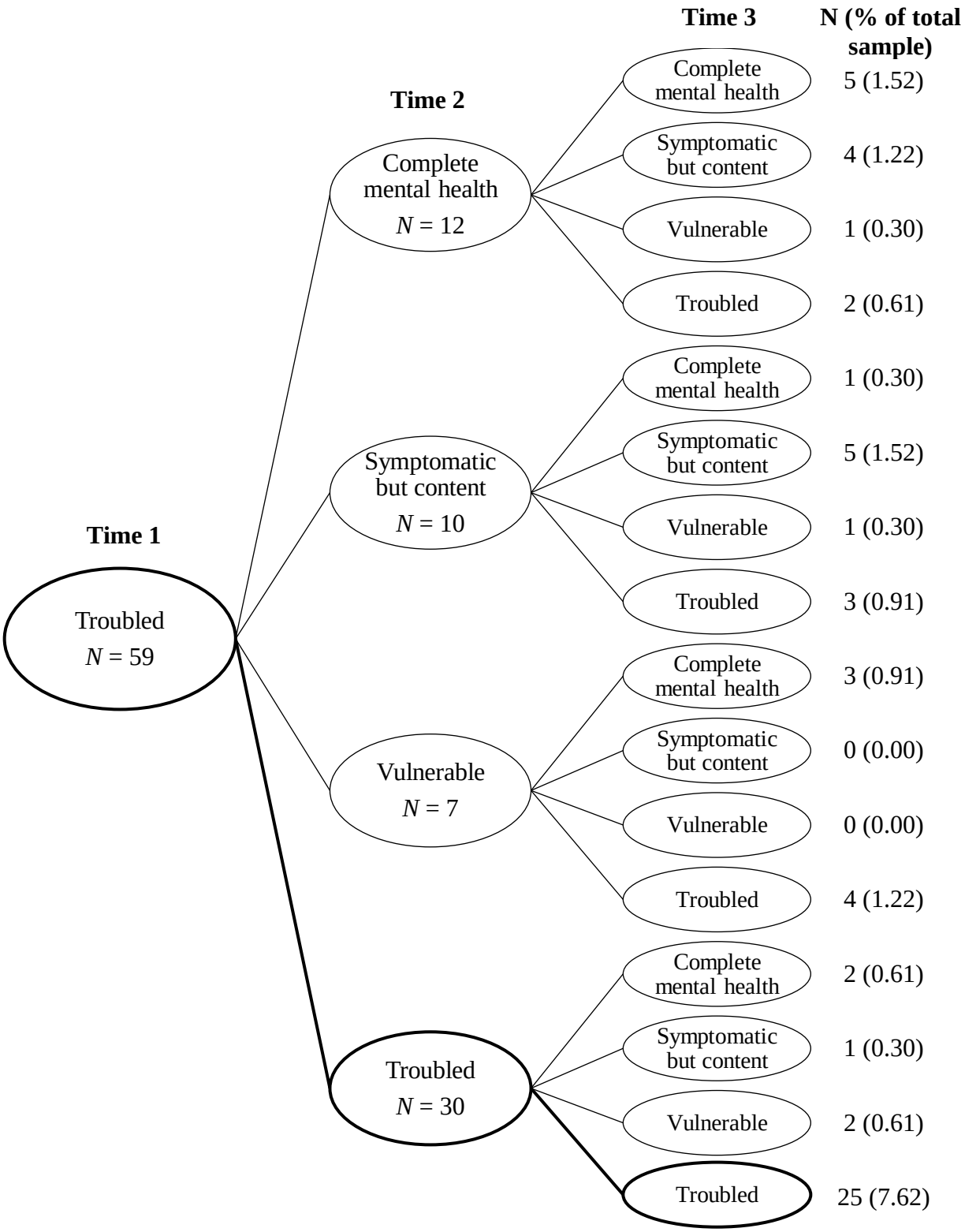

Figure 4. Mental health trajectories for participants starting in troubled group.*

**Pathway representing students who remained in the same group over time is in bold.*

type of change from the expected proportion (displayed in Figure 5) indicated that the group representing changes in both psychopathology and SWB contributed the most to the chi-square statistic, with more students than the expected 33% demonstrating changes in both dimensions (i.e., a positive deviation). Both the change in psychopathology only group and the change in SWB only group contributed a moderate amount, with less students than the expected 33% demonstrating changes in only one dimension (i.e., negative deviations).

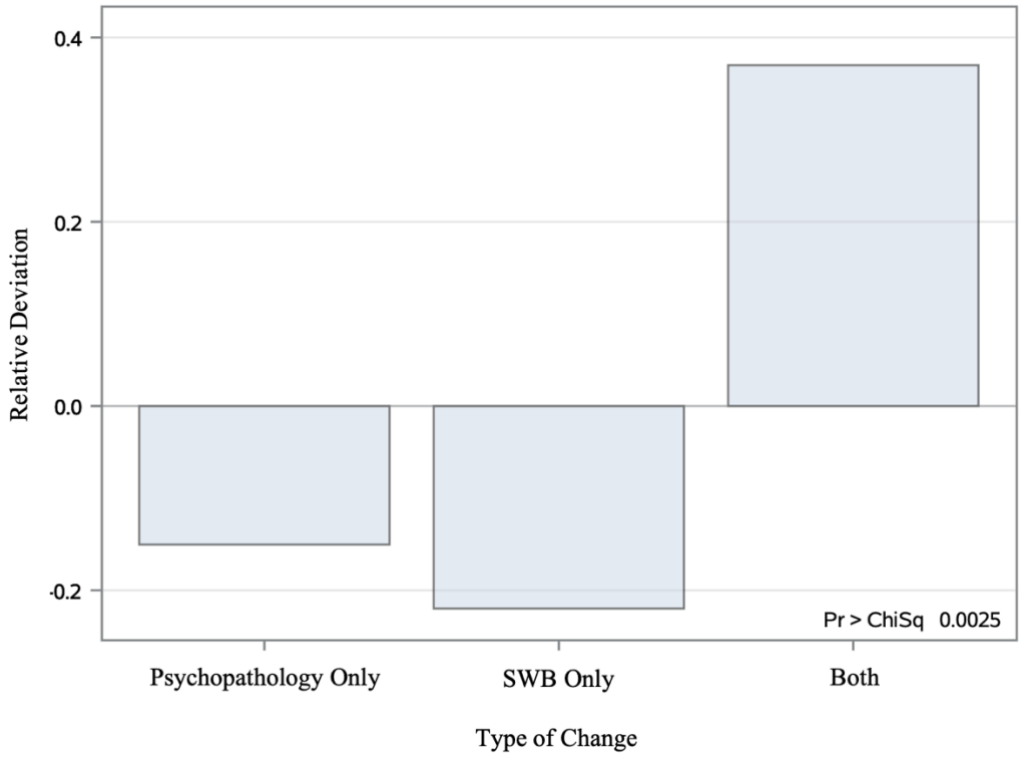

Figure 5. Deviations of each type of change from the expected proportion.

Relationship Between Mental Health Status at Time 1 and Academic Adjustment Across Time (Question 3)

Question 3 examined the relationship between students' group membership at Time 1 (predictor variable) and the following dependent variables, while controlling for intervention group (i.e., participation in the ACE intervention):

1. Academic performance (i.e., GPA) at Time 2 and Time 3.
2. Behavioral engagement at Time 1, Time 2, and Time 3.
3. Affective engagement at Time 1, Time 2, and Time 3.
4. Cognitive engagement at Time 1, Time 2, and Time 3.

Eleven two-level multilevel models were conducted to account for the nesting of students (level 1) within 15 different school programs (level 2), as well as individual differences (between-group and individual variation). The complete mental health group was used as the reference group. Results from the analyses are displayed in Table 10.

Mental Health Status and GPA

For the two-level hierarchical model predicting students' academic performance at Time 2, neither the troubled group (b = -.08, p = .31), symptomatic but content group (b = .07, p = .52), nor vulnerable group (b = -.16, p = .12) differed significantly from the complete mental health group; however, at Time 3, the troubled and vulnerable groups differed significantly from the complete mental health group in academic performance, with membership in the troubled group predicting a .17 unit decrease in GPA (p = .04) and membership in the vulnerable group predicting a .32 unit decrease in GPA (p = .003). The symptomatic but content group did not significantly differ from the complete mental health group in GPA at Time 3 (b = .07, p = .52).

Mental Health Status and Behavioral Engagement

For the two-level hierarchical model predicting behavioral engagement at Time 1, both the troubled group (b = -.26, p < .0001) and the vulnerable group (b = -.26, p = .001) differed significantly from the complete mental health group; however, at Time 1, the symptomatic but content group did not differ from the complete mental health group in behavioral engagement

Table 10

Two-Level Hierarchical Linear Model Results

Dependent Variable	Parameter	Parameter Estimate	Standard Error	*p*
Time 2 GPA	*Fixed Effects*			
	Intercept	3.51	.09	<.0001
	Troubled	-.08	.08	.31
	Symptomatic but content	.07	.10	.52
	Vulnerable	-.16	.10	.12
	Complete mental health	0	--	--
	Intervention	.005	.12	.97
	Variance Estimates			
	Intercept (School Program)	.04	.02	.03
	Residual	.28	.02	<.0001
	Fit Indices	AIC = 549.5	BIC = 550.9	
Time 3 GPA	*Fixed Effects*			
	Intercept	3.55	.07	<.0001
	Troubled	-.17	.08	.04*
	Symptomatic but content	.07	.11	.52
	Vulnerable	-.32	.11	.003*
	Complete mental health	0	--	--
	Intervention	-.06	.09	.51
	Variance Estimates			
	Intercept (School Program)	.01	.01	.12
	Residual	.30	.02	<.0001
	Fit Indices	AIC = 555.4	BIC = 556.8	
Time 1 Behavioral Engagement	*Fixed Effects*			
	Intercept	3.52	.04	<.0001
	Troubled	-.26	.06	<.0001*
	Symptomatic but content	-.06	.08	.46

Table 10 (Continued)

Dependent Variable	Parameter	Parameter Estimate	Standard Error	*p*
	Vulnerable	-.26	.08	.001*
	Complete mental health	0	--	--
	Intervention	.04	.05	.39
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	.17	.01	<.0001
	Fit Indices	AIC = 358.7	BIC = 359.4	
Time 2 Behavioral Engagement	*Fixed Effects*			
	Intercept	3.37	.05	<.0001
	Troubled	-.28	.07	<.0001*
	Symptomatic but content	-.03	.09	.81
	Vulnerable	-.19	.09	.04*
	Complete mental health	0	--	--
	Intervention	.14	.05	.009*
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	.22	.02	<.0001
	Fit Indices	AIC = 443.2	BIC = 443.9	
Time 3 Behavioral Engagement	*Fixed Effects*			
	Intercept	3.27	.05	<.0001
	Troubled	-.20	.08	.008*
	Symptomatic but content	-.01	.10	.89
	Vulnerable	-.15	.10	.13
	Complete mental health	0	--	--
	Intervention	.14	.06	.02*
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	.26	.02	<.0001

Table 10 (Continued)

Dependent Variable	Parameter	Parameter Estimate	Standard Error	*p*
	Fit Indices	AIC = 504.1	BIC = 504.8	
Time 1 Affective Engagement	*Fixed Effects*			
	Intercept	3.06	.04	<.0001
	Troubled	-.52	.06	<.0001*
	Symptomatic but content	-.24	.07	.001*
	Vulnerable	-.45	.07	<.0001*
	Complete mental health	0	--	--
	Intervention	.09	.04	.048*
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	.15	.01	<.0001
	Fit Indices	AIC = 325.5	BIC = 326.2	
Time 2 Affective Engagement	*Fixed Effects*			
	Intercept	2.90	.04	<.0001
	Troubled	-.37	.06	<.0001*
	Symptomatic but content	-.08	.08	.32
	Vulnerable	-.35	.08	<.0001*
	Complete mental health	0	--	--
	Intervention	.22	.05	.002*
	Variance Estimates			
	Intercept (School Program)	.003	.004	.21
	Residual	.16	.01	<.0001
	Fit Indices	AIC = 347.6	BIC = 349.0	
Time 3 Affective Engagement	*Fixed Effects*			
	Intercept	2.83	.06	<.0001
	Troubled	-.34	.07	<.0001*
	Symptomatic but content	-.03	.09	.71

Table 10 (Continued)

Dependent Variable	Parameter	Parameter Estimate	Standard Error	*p*
	Vulnerable	-.24	.09	.006*
	Complete mental health	0	--	--
	Intervention	.16	.08	.07*
	Variance Estimates			
	Intercept (School Program)	.02	.01	.10
	Residual	.20	.02	<.0001
	Fit Indices	AIC = 434.7	BIC = 436.1	
Time 1 Cognitive Engagement	*Fixed Effects*			
	Intercept	5.68	.09	<.0001
	Troubled	-.74	.13	<.0001*
	Symptomatic but content	-.30	.17	.09
	Vulnerable	-.59	.17	.001*
	Complete mental health	0	--	--
	Intervention	.18	.10	.08
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	.81	.06	<.0001
	Fit Indices	AIC = 869.7	BIC = 870.4	
Time 2 Cognitive Engagement	*Fixed Effects*			
	Intercept	5.43	.10	<.0001
	Troubled	-.74	.15	<.0001*
	Symptomatic but content	-.23	.20	.25
	Vulnerable	-.37	.20	.06
	Complete mental health	0	--	--
	Intervention	.25	.12	.03*
	Variance Estimates			
	Intercept (School Program)	.001	.02	.48
	Residual	1.06	.09	<.0001

Table 10 (Continued)

Dependent Variable	Parameter	Parameter Estimate	Standard Error	*p*
	Fit Indices	AIC = 959.7	BIC = 961.2	
Time 3 Cognitive Engagement	*Fixed Effects*			
	Intercept	5.42	.11	<.0001
	Troubled	-.71	.16	<.0001*
	Symptomatic but content	-.22	.21	.30
	Vulnerable	-.73	.21	.001*
	Complete mental health	0	--	--
	Intervention	.08	.12	.51
	Variance Estimates			
	Intercept (School Program)	0	--	--
	Residual	1.18	.09	<.0001
	Fit Indices	AIC = 994.1	BIC = 994.8	

(b = -.06, p = .46). The troubled and vulnerable groups significantly differed from the complete mental health group on behavioral engagement at Time 2, with membership in the troubled group predicting a .28 unit decrease in behavioral engagement ($p < .0001$) and membership in the vulnerable group predicting a .19 unit decrease in behavioral engagement (p = .04). The symptomatic but content group did not significantly differ from the complete mental health group at Time 2 (b = -.03, p = .81). At Time 3, only the troubled group significantly differed from the complete mental health group in behavioral engagement (b = -.20, p = .008). The symptomatic but content group (b = -.01, p = .89) and vulnerable group (b = -.15, p = .13) did not significantly differ from the complete mental health group. Notably, for all three time points, the between school variance in the intercepts was estimated to be zero, meaning there was no evidence of sampling error between school program. In other words, the nesting of students in different school programs did not explain variability in the data for these models. At Time 2 and Time 3 only, intervention group significantly predicted behavioral engagement (b = .14, p = .009 and b = .14, p =.02, respectively).

Mental Health Status and Affective Engagement

For the two-level hierarchical model predicting affective engagement at Time 1, the troubled group (b = -.52, $p < .0001$), symptomatic but content group (b = -.24, p = .001), and vulnerable group (b = -.45, $p < .0001$) all significantly differed from the complete mental health group. At Time 2, the troubled and vulnerable groups significantly differed from the complete mental health group in affective engagement, with membership in the troubled group predicting a .37 unit decrease in affective engagement ($p < .0001$) and membership in the vulnerable group predicting a .35 unit decrease in affective engagement ($p < .0001$). The symptomatic but content group did not significantly differ from the complete mental health group at Time 2 (b = -.08, p =

.32). At Time 3, the troubled group (b = -.34, p < .0001) and vulnerable group (b = -.24, p = .006) significantly differed from the complete mental health group in affective engagement. The symptomatic but content group did not significantly differ from the complete mental health group at Time 3 (b = -.03, p = .71). For Time 1 only, there was no evidence of sampling error between school program. At Time 1 and Time 2 only, intervention group significantly predicted affective engagement (b = .09, p = .048 and b = .22, p =.002, respectively).

Mental Health Status and Cognitive Engagement

For the two-level hierarchical model predicting cognitive engagement at Time 1, the troubled group (b = -.74, p < .0001) and vulnerable group (b = -.59, p = .001) significantly differed from the complete mental health group. The symptomatic but content group did not significantly differ from the complete mental health group in cognitive engagement at Time 1 (b = -.30, p = .09). At Time 2, membership in the troubled group significantly predicted a .74 unit decrease in cognitive engagement (p < .0001). The symptomatic but content group (b = -.23, p = .25) and vulnerable group (b = -.37, p = .06) did not significantly differ from the complete mental health group. At Time 3, the troubled group (b = -.71, p < .0001) and vulnerable group (b = -.73, p = .001) significantly differed from the complete mental health group in cognitive engagement. The symptomatic but content group did not significantly differ from the complete mental health group (b = -.22, p = .30). As with students' behavioral engagement, there was no evidence of sampling error between school program for Time 1 or Time 3. At Time 2 only, intervention group significantly predicted cognitive engagement (b = .25, p = .03).

CHAPTER FIVE:

DISCUSSION

Using a dual-factor model (DFM) of mental health as a framework, this study explored the stability of mental health status for high school students enrolled in accelerated curricula, as well as the relationship between their initial mental health status and concurrent and subsequent academic adjustment. Using three waves of data, the study addressed the following questions: To what extent is group membership in the four quadrants of a DFM stable across three time points, each 9-12 months apart, for high school students enrolled in accelerated curricula? Is change in group membership due to change in psychopathology, subjective well-being, or both? What is the relationship between group membership at Time 1 and academic adjustment (i.e., academic performance and student engagement)? The following sections summarize key findings from the study and consider how these findings contribute to existing literature and educational decision-making. Finally, the study's limitations and future directions for research are discussed.

Key Findings

Stability of Mental Health Status

The first aim of the study was to examine the stability of students' mental health trajectories during middle adolescence. The majority of students fell in the complete mental health group at all three time points. The next largest group consisted of students with troubled mental health, followed by the vulnerable and symptomatic but content groups. Notably, students classified as high in psychopathology tended to report clinically elevated internalizing problems at all three time points (approximately 81%, 81%, and 86%, respectively, of students classified

as “elevated psychopathology”), as opposed to externalizing problems or both internalizing and externalizing problems. The low levels of externalizing problems found in the current sample align with previous research indicating youth in accelerated coursework report fewer externalizing symptoms as compared to typical samples of high school students (Shaunessy et al., 2006; Suldo & Shaunessy-Dedrick, 2013). Conversely, the rates of students who reported elevated internalizing symptoms exceeded the expected proportion based on the ASEBA normative sample of 1,057 youth, which was representative of geographic and gender diversity within the U.S. at the time of data collection (1999-2000; Achenbach & Rescorla, 2001). In the normative group, a *T*-score of 65 or greater classified 7% of youth as elevated in internalizing symptoms. In the current study, however, a *T*-score of 65 or greater classified approximately 27-36% of students as elevated in symptoms of psychopathology across the three time points, with the majority of those students displaying solely internalizing symptoms. Reasons for this difference in results are unknown. The high rates of students identified as having internalizing problems could reflect true differences in elevated internalizing problems specific to students in AP/IB, or societal trends in increased rates of emotional distress over 20 years since the BPM-Y norm group was examined. Possible implications of these findings for students’ academic outcomes are discussed below.

While the proportions of students in all four groups remained stable from Time 1 to Time 2, both the complete mental health group and the troubled group changed significantly from Time 2 to Time 3. Specifically, the proportion of students in the complete mental health group decreased between the end of 9th grade and the end of 10th grade, while the proportion of students in the troubled group increased. This finding partially supports the results of previous studies, which indicate that the complete mental health group is largely stable across two time points

(Kelly et al., 2012; McMahan, 2012; Moore et al, 2019; Xiong et al., 2017); however, the current findings also suggest that the same level of stability is not maintained across additional time points, or longer periods of time.

Furthermore, approximately 47% of students remained in the same mental health group over time, with the majority of students staying in the complete mental health group (37.80% of total sample) or troubled group (7.62% of total sample). The remaining 53% of students changed mental health groups at least once. The most common changes in mental health status were: for students in the complete mental health groups at Times 1 and 2, a transition to the vulnerable group (4.88%), troubled group (5.18%), or symptomatic but content group (3.05%) at Time 3, and for students in the symptomatic but content group at Time 1, a transition to the complete mental health group at Times 2 and 3 (3.35%). The remaining participants who changed groups were divided among 46 mental health trajectories, with the proportion of students in each ranging from 0.3% to 1.83%. In sum, approximately half of the sample demonstrated stable mental health across time, with the other half most frequently shifting in or out of the complete mental health group. These findings align with previous research indicating that slightly more than half of students maintain the same mental health status over time (McMahan, 2012; Xiong et al., 2017).

Role of Psychopathology and SWB

The second aim of the study was to determine whether changes in students' mental health status were due to changes in psychopathology, SWB, or both. Further examination of the findings described above indicates that students who changed mental health groups at least once most frequently demonstrated either (1) a decrease in SWB (transitioned from complete mental health to vulnerable), (2) an increase in psychopathology (transitioned from complete mental

health to symptomatic but content), (3) a decrease in psychopathology (transitioned from symptomatic but content to complete mental health), or (4) a simultaneous decrease in SWB and increase in psychopathology (transitioned from complete mental health to troubled). Students did not frequently demonstrate increases in SWB. Thus, students who changed mental health status tended to deteriorate on one or both dimensions of mental health, with the exception of those who transitioned from the symptomatic but content group to the complete mental health group. Additional analyses indicated that the majority of students demonstrated changes in both psychopathology and SWB (45.66%), with significantly smaller proportions of students showing changes in only one area (28.32% for psychopathology only, 26.01% for SWB). When considered alongside the significant decrease in students with complete mental health (i.e., low psychopathology, average to high SWB) at Time 3, as well as the significant increase in troubled students (i.e., elevated psychopathology, low SWB), these results suggest that students' changes in mental health status frequently resulted from a simultaneous increase in symptoms of psychopathology and decrease in SWB. These findings align with previous research establishing psychopathology and SWB as correlated but distinct variables (Greenspoon & Saklofske, 2001; Suldo & Huebner, 2004), meaning it is possible for both variables to deteriorate, or for only one variable to deteriorate.

Mental Health Status and Academic Adjustment

The third aim of the study was to investigate the relationship between students' initial mental health status and both immediate and long-term academic outcomes. While results of the first two research questions reveal a notable amount of variability in students' mental health status across time, students' initial mental health status still demonstrated long-lasting implications for academic outcomes. In terms of academic performance, mental health status at

the beginning of 9th grade did not significantly predict students' end-of year GPAs. At the end of 10th grade, however, initial membership in the troubled or vulnerable group predicted significantly lower GPAs than membership in the complete mental health group. Thus, students who reported low SWB at Time 1 experienced delayed negative effects on their academic performance that were apparent nearly two years later. The same effects were not seen for students in the symptomatic but content group, suggesting that low SWB had a greater effect on later GPA than elevated psychopathology.

In terms of students' behavioral engagement, membership in the troubled or vulnerable group at the beginning of 9th grade predicted significantly lower behavioral engagement at the beginning and end of 9th grade. At the end of 10th grade, only membership in the troubled group predicted significantly lower behavioral engagement. These results demonstrate how students' levels of psychopathology and SWB can have both immediate and long-term effects on their on-task behavior, school attendance, effort, and attention in the classroom. As with students' GPA, membership in the vulnerable group, but not the symptomatic but content group, was significantly linked to behavioral engagement. Thus, SWB appears to have more notable implications for students' behavioral engagement than psychopathology.

Membership in the troubled or vulnerable group at Time 1 predicted lower affective engagement ratings at all three time points, meaning students with low SWB demonstrated less school belonging, poorer relationships with teachers and peers, and more negative attitudes toward school and/or the classroom when compared to students with complete mental health. Membership in the symptomatic but content group only predicted lower affective engagement at the beginning of 9th grade, again indicating the important link between SWB and students' academic outcomes.

Lastly, membership in the troubled or vulnerable group at the beginning of 9th grade predicted lower cognitive engagement ratings at the beginning of 9th and end of 10th grade. At the end of 9th grade, only membership in the troubled group significantly predicted lower cognitive engagement. Membership in the symptomatic but content group did not significantly predict youths' cognitive engagement across time, once again suggesting that students' psychopathology was not as strongly tied to academic outcomes as SWB.

In sum, membership in the troubled or vulnerable group, but not the symptomatic but content group, generally predicted lower academic performance and student engagement across time when compared to membership in the complete mental health group. Given that previous research with elementary school students has established a link between well-being and academic achievement (O'Conner et al, 2019; Yang et al., 2019), as well as psychopathology and academic achievement (Murphy et al., 2015), it is not surprising that the troubled group—which reflects poor mental health on both dimensions—demonstrated lower academic outcomes compared to the complete mental health group. This finding also aligns with studies examining a DFM with secondary school students, in which troubled youth demonstrated decreases in emotional, behavioral, and cognitive engagement (Lyons et al., 2013) and lower GPAs than youth with complete mental health (Moore et al., 2019; Suldo et al., 2016). From a resource allocation standpoint, students with a troubled mental health status may be in greatest need of tertiary supports in order to prevent the most deleterious outcomes.

Comparing the current results to research on vulnerable and symptomatic but content youth is more complex. For example, the present findings support those of Lyons et al. (2013), which indicated that the vulnerable group's emotional engagement declined over time while the symptomatic but content group's emotional engagement increased over time. The vulnerable

group's cognitive engagement also differed from that of the positive mental health group, while the symptomatic but content group's cognitive engagement did not (Lyons et al., 2013). Suldo et al. (2011) followed a group of middle school students across two time points separated by one year. In that study, changes in GPA did not differ significantly for students in the vulnerable and symptomatic but content groups. These findings indicate that students with low levels of SWB, even without clinically elevated levels of psychopathology (i.e., vulnerable youth), demonstrated similar academic outcomes to youth with elevated levels psychopathology who also report average-to-high SWB (i.e., symptomatic but content youth; Suldo et al., 2011). In other words, although while youth in the vulnerable group did not differ from youth in the symptomatic but content group to the same degree observed in the current study, SWB still appeared to serve as a protective factor for youth's academic performance. Finally, while Moore et al.'s (2019) study did not yield a vulnerable group using latent profile analysis, youth in the symptomatic but content group tended to have lower grades than those in the complete mental health (high well-being, low distress) or moderately mentally health (high-average well-being, low distress) groups. One possible explanation for this inconsistency in findings is that students in the current sample were much more likely to have internalizing problems (about 81-86% over time) than externalizing problems (about 4-11%) or both (about 8-12%). In other words, it is possible that youth with more externalizing symptoms would experience more academic difficulties than the current sample. Finally, it is worth noting that membership in the symptomatic but content group may not have predicted significant changes in most academic outcomes across time when compared to the complete mental health group because the sample size was not large enough to pick up significant differences.

Contributions to the Literature

The results of the current study contribute to existing literature in several ways. First, the findings support previous research indicating that group membership within a DFM is moderately stable when assessed using cut-scores (McMahan, 2012; Xiong et al., 2017), with approximately half of the current sample remaining in the same mental health group across three time points. These findings differ from those of Moore (2018), who found that less than 24% of students remained in the same group across three time points. The discrepancy may reflect Moore's use of latent profile analysis, as opposed to cut-scores, as well as her study's larger gap between time points (each 1 year apart). The proportion of students within each group in the current study changed significantly only from Time 2 to Time 3, suggesting the inclusion of a third time point helped capture additional fluctuations in mental health status.

Second, the study is the first to address whether changes in mental health status within a DFM resulted from changes in psychopathology and/or SWB. As described above, while most students displayed changes in both variables (45.66%), some showed changes in level of psychopathology only (28.32%) or SWB only (26.01%). More specifically, most students who changed mental health status demonstrated increases in psychopathology and/or decreases in SWB, suggesting that both dimensions tend to decline across the first two years of high school for youth with less stable mental health. While these results contradict studies that have found increases in life satisfaction over time for students in middle and high school (Lewis et al., 2011; Steinmayr et al., 2019), they support the findings of Antaramian and Huebner (2009), who found decreases in life satisfaction across the transition to high school, and Goldbeck et al. (2007), who found that life satisfaction declined linearly across adolescence. Cavallo et al. (2015) also examined trends in adolescents' life satisfaction, using cross-sectional data from nationally

representative samples of youth in 31 countries. Results indicated that life satisfaction tended to decrease over time for youth in most countries, with a marked drop occurring between the ages of 13 and 15 years old. More recently, Waters et al. (2019) examined trends in SWB across three time points, each six to eight months apart, for youth ages 12 to 15 years old. Findings suggested that SWB declined over time, with significant decreases in life satisfaction and positive affect, and significant increases in negative affect. Thus, given prior research demonstrating declines in components of SWB as youth age, it is not surprising that students in the current study who changed mental health status over time experienced decreases in SWB more frequently than increases in SWB.

Third, the results of the current study add to the literature on mental health and academics, which has yet to explore the relationship between mental health status within a DFM and changes in multiple indicators of academic adjustment over time. Although the current results suggest that a large proportion of students will experience changes in mental health status over time, the findings also reveal that initial mental health status remains linked to many immediate and long-term academic outcomes. In particular, the results indicated that vulnerable youth, but not symptomatic but content youth, were at risk for academic concerns in terms of both engagement and GPA. While the association between group membership and GPA was not apparent in the same year, examination of a third time point at the end of 10th grade revealed the influence of SWB on student achievement. While previous research examining the longitudinal relationship between SWB and academic outcomes during middle adolescence has found significant results for both immediate academic performance and academic performance assessed 14-months later (Wu et al., 2020), there are limited studies that directly explore the association between SWB and both concurrent and delayed academic performance. One possible explanation

for the current findings relates to the broaden-and-build theory of positive emotions, which posits that experiencing positive emotions helps broaden an individual's outlook and build their abilities (Fredrickson, 2001). This theory suggests that high levels of SWB may not relate to students' immediate GPAs, but may lead to increased academic performance as students strengthen their creativity, problem-solving, and academic skills over time.

Implications for School-Based Services

The results of this study can help inform school-based delivery of mental health services in three key ways. First, the results align with research indicating that youth may experience declines in psychopathology only, SWB only, or—most likely—both. Thus, it is important for schools to assess both dimensions of mental health when identifying youth for mental health services. While brief measures of psychopathology, such as the Behavioral and Emotional Screening System (BESS) of the Behavior Assessment System for Children-Third Edition (BASC-3; Reynolds & Kamphuas, 2015), already may be common in some school settings, the current findings also support the use of measures of SWB. The measures used in the current study—the SLSS (Huebner, 1991) and PANAS-C-10 (Ebesutani et al., 2012)—are examples of free measures that assess components of SWB (life satisfaction and positive/negative affect, respectively). Another measure of SWB that would be appropriate for use with high school students is the Social Emotional Health Survey-Secondary (SEHS-S; Furlong et al., 2014), which assesses students' psychological strengths (i.e., gratitude, optimism, zest, and persistence).

Second, the findings reveal a significant change in students' mental health status between the end of 9th and end of 10th grade, with the proportion of students in the troubled group increasing and the proportion of students in the complete mental health group decreasing. Given that 10th grade students appear to be particularly at-risk for declining mental health, early high

school is a crucial time to focus on delivering mental health supports. Although approximately 40% of students will remain in the complete mental health group at this time, a slight majority of students will be in need of some degree of support when sub-optimal mental health is operationalized as elevated psychopathology and/or low SWB. These results align well with a multi-tiered system of supports for school-based mental health services. Specifically, schools can implement universal supports at Tier 1 that target components of SWB. At Tier 2, students at-risk for declining mental health (e.g., students identified through 9th grade screening) could benefit from targeted, time-limited interventions focused on either psychopathology (i.e., symptomatic but content youth) or SWB (i.e., vulnerable youth). Finally, troubled youth could receive Tier 3 supports, or intense interventions focused on both dimensions of complete mental health.

Third, the results suggest that low levels of SWB during the beginning of 9th grade have a larger influence on later GPA, as well as immediate and long-term dimensions of student engagement, than elevated psychopathology. That is, students' SWB at the start of 9th grade appears to be highly important in relation to academic outcomes. High schools therefore should consider identifying vulnerable youth (i.e., those with low levels of SWB who do not display clinically elevated levels of psychopathology) as students enter 9th grade, so school-based mental health professionals can provide preventative services and reduce their risk for later academic difficulties.

Limitations

There were several limitations to this study that should be noted and perhaps addressed in future studies. First, the sample included only 9th and 10th grade students who were in AP courses or the IBD program, which limits the generalizability of the results to high school students

enrolled in accelerated coursework. Since these youth may experience heightened feelings of school burnout, which has been linked to increased depressive symptoms and decreases in SWB, it is possible that the current sample experienced larger declines in mental health status than may be seen in a normative high school sample. It is worth noting, though, that research has shown that students enrolled in AP courses or the IBD program demonstrate similar mental health concerns to other high school students in terms of externalizing and internalizing psychopathology and life satisfaction (Suldo et al., 2018).

Second, since the study utilized archival data from a larger IES project, approximately 64% of the sample participated in an intervention that included the ACE universal class-wide SEL curricula that aims to build AP/IB students' proactive school engagement and use of effective coping styles, followed by a mid-year screening of students' academic and emotional well-being, and one to two MAP meetings for the minority of students identified as at-risk in regard to stress, engagement, and academics. Since it was possible that students' participation in this intervention influenced their group membership across time, intervention group was controlled for in all multilevel models. Results indicated that participation in the intervention group predicted some slight increases in students' engagement across time.

A third limitation was the study's reliance on self-report data to assess psychopathology and SWB, as some youth may be tempted to provide answers they view as socially acceptable, rather than those that reflect their true experience. Future research should consider including teacher, peer, or parent report of youth mental health (particularly of externalizing problem behavior, which youth may underreport) when determining group membership in a DFM. Also relevant to methods, conclusions from this study may be limited due to use of a clinical measure

(the BPM-Y) that, although used routinely in school-based practice, is in need of more current normative data.

A fourth limitation was the study's use of cut-scores, which reduce continuous data to a dichotomous score. The results therefore may not fully convey the potential variations in high school students' mental health status. Due to measurement error, it is plausible that changes in students' mental health status occurred less frequently than was observed in the data, particularly when students' ratings fell near the cut-scores at a given time point. Finally, it should be noted that alpha adjustments were not made to control for multiple tests.

Future Directions

Results from the current study clearly indicate the importance of assessing and supporting AP/IB students' mental health status through a DFM. Future directions include examining the stability of mental health status, as well as related academic outcomes, in samples of students not enrolled in accelerated coursework. Such a study would not only increase the generalizability of the current study, but also help guide the work of school-based mental health professionals when working with students beyond academically accelerated classrooms. Similarly, given the unique stressors that accompany students' transition to high school (e.g., new social dynamics, increased academic pressure), future studies on a DFM could follow students across this transition. By beginning data collection during 7th or 8th grade, researchers could gain a better understanding of how students' mental health trajectories change as they are exposed to and then adjust to high school.

Another avenue for future research involves further exploring the link between students' mental health status and academic outcomes. The current study provides a strong rationale for educators to focus on assessing and targeting youth's mental health through a DFM, particularly

during 9th and 10th grade. Next steps could involve examining how different mental health trajectories predict students' GPA and engagement. For example, do students who start in the complete mental health group and transition to the troubled group experience more academic difficulties than those who remain in the complete mental health group? What about youth who start in the troubled group and transition to the complete mental health group? What about youth who experience a brief dip in mental health status at Time 2 and then "rebound" at a later time point? Answering these questions could further understanding of the relationship between students' complex mental health trajectories and academic outcomes.

Future studies also may further explore the influence of SWB versus psychopathology and when predicting both immediate and long-term academic outcomes. The results of the current study indicate that vulnerable youth (who experience low levels of SWB despite having low levels of psychopathology) may be at higher risk for academic concerns than symptomatic but content youth (who experience high levels of SWB despite having elevated levels of psychopathology). Researchers may examine these results more closely by comparing academic outcomes for vulnerable youth directly to the outcomes of symptomatic but content youth. Similarly, the current sample of students with elevated levels of psychopathology tended to report internalizing concerns, rather than externalizing concerns. Since it is possible that youth with more externalizing concerns may experience different academic outcomes than youth in the current study, future research could examine the relationship between different types of psychopathology (e.g., internalizing versus externalizing concerns) on students' academic outcomes.

A final route for future research involves developing and investigating relevant interventions. For example, troubled youth, who experience both low levels of SWB and

elevated levels of psychopathology, would logically stand to benefit from interventions targeting both of these dimensions of mental health. Many school-based interventions tend to focus on *either* SWB or psychopathology, and research has not focused on the effects of these interventions in the context of a DFM. Future research therefore could examine the differential effects of existing programs for each quadrant of a DFM.

Additionally, application of a DFM to programs that consider both psychopathology and SWB could contribute to the literature on the effectiveness of these interventions for different groups of youth. For example, Positive Psychotherapy (PPT; Rashid & Seligman, 2018)—a positive psychology intervention developed for individuals demonstrating moderate to severe symptoms of depression—incorporates activities shown to increase SWB. Rashid (2015) summarized 13 pilot and feasibility studies that applied PPT to a variety of internalizing concerns (e.g., depression, anxiety, borderline personality disorder) and provide empirical support for the intervention. Mahmoudi and Khoshakhlagh (2018) examined the effectiveness of PPT with a sample of 30 adolescents (ages 13 to 17 years old) in Isfahan, an Iranian city. Participants included students from 10 schools who (1) had visited their school counselor and (2) demonstrated symptoms of depression on a narrowband assessment. Participants were randomly assigned to either the treatment or wait-list no-treatment control group. Adolescents receiving PPT demonstrated significant increases in well-being (measured using the Psychological Wellbeing Inventory; Ryff, 1989), as well as self-esteem, at both post-intervention and two-month follow-up when compared to the control group. Given the high rate of internalizing symptoms in the current study's sample, as well as research supporting the use of PPT with adolescents, the intervention appears to be a good fit for troubled youth who demonstrate both low SWB and high psychopathology. Thus, PPT is described in greater detail below.

PPT sessions can be completed with an individual or in small groups, and exercises can provide stand-alone treatment or be incorporated into other treatment methods (Rashid, 2015). At the heart of PPT, the clinician "empathetically understands and attends to pain associated with trauma and simultaneously explores the potential for growth" (Rashid & Seligman, 2018, p. 3). Grounded in Seligman's (2002, 2012) PERMA model and character strengths (Peterson & Seligman, 2004), PPT acknowledges the client's strengths and inherent capacity for growth, as well as a therapeutic relationship built upon exploration of the client's positive characteristics and experiences (Rashid & Seligman, 2018). The intervention includes 15 sessions that fall into the following three phases: (1) the client develops a personal story about a time they were at their best, identifies signature strengths, and obtains skills needed to integrate these strengths with their stressors (sessions 1-4); (2) the client learns to reappraise their experiences with a focus on the positive (sessions 5-8); and (3) the client pursues purpose using their strengths (sessions 9-15). Each session follows a similar structure, which includes introducing the core topics in jargon-free language, practicing relaxation, reviewing the client's gratitude journal and the previous session, time for practice and reflection, discussion of a case example, sharing of maintenance strategies and resources, and a final brief relaxation period (Rashid & Seligman, 2018). Embedded throughout all sessions is an awareness of cultural considerations and need for flexibility. Rashid and Seligman's (2018) PPT Clinical Manual provides in-depth descriptions of each session.

Summary

Results from the current study indicate that mental health status within a DFM is moderately stable for students enrolled in accelerated coursework during middle adolescence. For students who experience changes in their mental health status, these changes are most

frequently due to deterioration in both psychopathology and SWB; however, some youth experience changes in only one domain, reflecting how these concepts are distinct but related. In terms of the relationship between initial mental health status and academic outcomes, students in the vulnerable and troubled groups, in particular, experience statistically significant academic problems across time when compared to the complete mental health group. Notably, mental health status only predicted delayed academic outcomes when examining GPA but predicted both immediate and long-term outcomes for student engagement, which may be more sensitive to immediate change. Additionally, level of SWB appeared to be linked more strongly to academic outcomes than level of psychopathology, lending support to the need for schools to focus on SWB during assessment and intervention efforts. As a whole, these findings contribute to the literature on a DFM and emphasize the important role mental health services can play in school settings.

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APPENDICES

Appendix A: IRB Approval

RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

7/15/2015

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

RE: **Expedited Approval for Initial Review**
IRB#: Pro00022787
Title: Facilitating Academic Success and Emotional Well-Being Among High School Students in Accelerated Curricula

Study Approval Period: 7/14/2015 to 7/14/2016

Dear Dr. Suldo:

On 7/14/2015, 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):
Augmented Narrative for Goal 2 IES grant

Consent/Assent Document(s)*:
Honors Student Consent_Year 1_Student Focus Groups_FINAL.pdf
Parent Consent_Year 1_Student Focus Groups_FINAL.pdf
Parent-Teacher-Admin Consent_Year 1_FINAL.pdf
SMH Provider Consent_Year 1_FINAL.pdf
Student Assent_Year 1_Student Focus Groups_FINAL.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review

research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

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

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

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

This research involving children was approved under the minimal risk category 45 CFR 46.404: Research not involving greater than minimal risk.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via 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., Vice Chairperson
USF Institutional Review Board

Appendix B: Parental Consent Form

Study ID:Ame11_Pro00022787 Date Approved: 7/18/2017

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 Advancing Coping and Engagement (ACE) program. The ACE program is a classroom curriculum designed to teach students 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 Shaunessy-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 he or she is in an AP or IB class.
- ✓ 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 all AP and IB students' coping skills and strong connections to their school. We are also evaluating the usefulness of brief, one-on-one supports (coaching meetings) that are offered in the second half of the school year to students who may have challenges managing their academic demands. The information that we collect from students will be used to improve our intervention materials. This process will ensure the program is highly usable with future AP and IB students. The evaluation will determine the program's impact on students' emotional and academic well-being. 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, or provide feedback to coaching meetings, will receive a $10 gift card on each occasion. Also, all students who return this completed form (whether or not you grant your child permission to participate) will be entered in a drawing for a $50 gift card.
- ✓ What Participation Requires: Participating schools will be randomly assigned to one of two groups: *intervention* and *control*. Schools in the *intervention* group will receive support through USF during the 2017-18 school year to deliver the ACE program to select classes of 9th grade AP/IB students. Mid-way through the year, *intervention* schools will examine students' emotional and academic status through a screening. During this screening, students will complete a short survey with questions about their current level of stress and feelings about school. It will take students about 5 minutes to complete that survey. Students' ratings will be considered along with data from students' school records (first semester course grades and attendance), and teacher nominations of students who have shown signs of academic or emotional challenges. Extra support will be offered to students whose screening data indicates signs of challenges with managing academic demands. That support involves 1-2 meetings with an ACE coach. ACE coaches are from the USF research team, and are not district staff. Within each 30-60 minute meeting, students describe their values, goals, and strengths, connecting the targets in the classwide ACE program to their future goals.

  Students in the *intervention* schools who have your permission to participate in the evaluation of these supports will be asked to provide feedback on the content of the ACE program and, if applicable, the brief coaching meetings. At the end of each weekly presentation in the classwide ACE program, and at the end of each coaching meeting, participants in this study will be asked questions about the value and quality of ACE program materials through the completion of brief rating scales about the content and activities. It will take about 5 minutes to complete the brief forms, on each occasion. All discussions during individual meetings with ACE coach will be audio recorded and de-identified (all names removed from audiofiles) for research and training. Consenting for your child to participate in this project also indicates your consent for your child to be audio recorded.

  Schools in the *control* group will receive the ACE program training and intervention materials for use during the 2018-19 school year. Students in both the *intervention* and *control* groups 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). Surveys also ask about students' demographic features, including two questions about parents' educational attainment. Survey packets will be given near the beginning and end of the school year. 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 course schedule. In total, participation will take no more than 2 hours for students in *control* group schools or 2-3 hours for students in *intervention* group schools during the 2017-18 school year.

  A final part of participation involves a confidential review of your child's school records. School/district employees will provide the USF team with your child's: demographic details including race/ethnicity, eligibility for free or reduced-price lunch, identification as an English Language Learner or a student with an exceptionality; district student ID numbers; achievement and in-school behavior during 2017-18 (attendance and discipline history [number

of office referrals], class performance [grades earned in each course], 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 during some program activities will be digitally audio recorded, and then assigned a code number to protect the confidentiality of his or her statements. 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 or comments during meetings with an ACE coach indicate extreme emotional distress, we will contact district mental 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. Within the intervention schools, the mid-year screening of student academic and emotional status will not occur without prior parent notification. That notification form will describe the screening process, and provide instructions for how to contact the school to opt out your child from the screening if so desired by you or your child.
- ✓ What We'll Do With Your Child's Responses: We plan to use the information from students to further develop and improve, and determine the effectiveness of, intervention materials 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 green paper with the completed form to his or her designated teacher. Keep the other copy of this letter (printed on gold paper) for your records.

Sincerely,

Shannon Suldo (Professor, School Psychology)
Department of Educational & Psychological Studies

Elizabeth Shaunessy-Dedrick (Professor, Gifted Education)
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.

_____	_____	_____
Printed name of child taking part in the study	Grade level of child	High school

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

(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 phone number has been provided in the event of additional questions.

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

Appendix C: Student Assent Form

Study ID:Ame11_Pro00022787 Date Approved: 7/18/2017

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 the project is to evaluate 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 because you are a student in an AP or IB class.
- ✓ 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. We are also examining the usefulness of extra support—coaching meetings—offered to students who may have challenges managing their academic demands. We will use the information that we collect from students to improve our materials. The evaluation will determine the program's impact on students' emotional and academic well-being. 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. Also, students in *intervention* schools who provide feedback on coaching meetings will receive a $10 gift card on each occasion. All students who return this completed form (whether or not you participate) will be entered in a drawing for a $50 gift card.
- ✓ What Will Happen During This Study: There are four main parts to this research study: (1) program evaluation, (2) ACE program feedback (3) mid-year screening, and (4) extra support for some students.
  - ***Program Evaluation:*** Schools will be randomly assigned to one of two groups: *intervention* or *control*. Students in both groups will be asked to complete a survey packet asking about how they 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. Students will also be asked to share their demographic information. Survey packets will be given near the beginning and end of the school year, and will take about 45 minutes to complete 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 demographics such as, race/ethnicity, eligibility for free or reduced-price lunch, identification as an English Language Learner or a student with an exceptionality; district student ID numbers; grades and end-of-course exam scores, attendance, and discipline history during 2017-18.
  - ***Weekly ACE Program Feedback:*** Schools assigned to the *intervention* group will receive support through USF during the 2017-18 school year. During the fall semester, USF ACE team members along with one of your teachers, will work together to deliver the ACE program to select classes of 9th grade AP/IB students. Students receiving the ACE Program will be asked to provide feedback on the curriculum content at the end of each weekly presentation through brief rating scales. Completion of these questions will take about 5 minutes on each occasion. Schools placed into the *control* group will receive the ACE program training and intervention materials for use during the 2018-19 school year.
  - ***Mid-Year Screening:*** In the *intervention* group schools, the USF team will examine students' emotional and academic status through a screening done mid-way through the year. The USF team will look at students first semester grades, and ask teachers which students may need extra help. Students will complete a short 5-minute survey with questions about their stress and feelings about school. You have the right to inspect the screening instruments to be used before the brief survey is administered. The surveys and directions for administering the surveys will be available at your school within a reasonable period of time prior to the screening.
  - ***Extra Support:*** Extra support will be offered to students whose screening data indicate signs of challenges with managing academic demands. That support involves 1-2 meetings with an ACE coach. ACE coaches are from

the USF research team, and are not district staff. Within each 30-60 minute meeting, students describe their values, strengths, and goals, and plan strategies to achieve their future goals. At the end of each meeting, students will be asked to provide feedback on the meeting content and usefulness, through completing brief rating scales. Completion of these questions will take about 5 minutes on each occasion.

In total, participation in research on the ACE program will take no more than 2 hours (*control* group) to 2 to 3 hours (*intervention* group) of your time during the 2017-18 year.

- ✓ 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 during some program activities will be audio recorded, and then assigned a code number to protect the confidentiality of his or her statements. 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. 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 or comments during meetings with an ACE coach 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 develop and improve materials for 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

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ASSENT TO TAKE PART IN THIS 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

(Portion 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

Appendix D: Demographics Form

Fall 2017 School: _____ Version: Code #:_____

1. Birthdate: _____ (month) - _____ (day) - _____ (year)

2. My age is: # $ % ^ 3. My gender is: _ Male ☐ Female

4. In middle school, were you:
   a. in an IB school (MYP)? _ No ☐ Yes Which school?_____
   b. in a magnet program? _ No ☐ Yes Which program?_____
   c. in Honors/advanced classes? _ No ☐ Yes

5. Are you of Hispanic, Latino, or Spanish origin?
   ✔ No, not of Hispanic, Latino, or Spanish origin
   Yes, Puerto Rican
   Yes, Cuban
   Yes, Mexican, Mexican American, Chicano
   Yes, another Hispanic, Latino, or Spanish origin (*specify*):_____

6. My race/ethnic identity is: (*circle all that apply*)
   White
   Black or African American
   Asian
   American Indian/Alaska Native
   Native Hawaiian or Other Pacific Islander
   Other (*specify*):_____

7. My parents are:
   Married
   Divorced
   Separated
   Never married
   Never married but living together
   Widowed

8. Which adult(s) do you live with most of the time?
   Mother and Father
   Mother only
   Father only
   Mother and Step-father (or partner)
   Father and Step-mother (or partner)
   Grandparent(s)
   Other relative (*please specify*): _____
   Other (*please specify*): _____

9. My father's highest education level is:
   8th grade or less
   Some high school, did not complete
   High school diploma/GED
   Some college, did not complete
   College/university degree
   Master's degree
   Doctoral level degree (Ph.D, M.D.) or other degree beyond Master's level

10. My mother's highest education level is:
   8th grade or less
   Some high school, did not complete
   High school diploma/GED
   Some college, did not complete
   College/university degree
   Master's degree
   Doctoral level degree (Ph.D, M.D.) or other degree beyond Master's level

Appendix E: Student Life Satisfaction Scale (SLSS)*

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

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

*Permission to reprint not needed as measure is free in the public domain.

Appendix F: 10-Item Positive and Negative Affect Scale for Children (PANAS-C-10)*

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past few weeks.

Feeling or emotion:	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Sad					
2. Happy					
3. Scared					
4. Miserable					
5. Cheerful					
6. Proud					
7. Afraid					
8. Joyful					
9. Mad					
10. Lively					

*Permission to reprint not needed as measure is free in the public domain.

Appendix G: Engagement vs. Disaffection (EVD)

Directions: We would like to know about your thoughts, feelings, and behavior in school. Please circle a number from (1) to (4) where (**1**) indicates you feel the statement is **not at all true** about you and (**4**) indicates you feel the statement is **very true about you**.

Statement:	**Not at all True**	**Not Very True**	**Sort of True**	**Very True**
1. I try hard to do well in school.	☐	☐	◂	▸
2. In class, I work as hard as I can.	☐	☐	◂	▸
3. When I'm in class, I participate in class discussions.	☐	☐	◂	▸
4. I pay attention in class.	☐	☐	◂	▸
5. When I'm in class, I listen very carefully.	☐	☐	◂	▸
6. When I'm in class, I feel good.	☐	☐	◂	▸
7. When we work on something in class, I feel interested.	☐	☐	◂	▸
8. Class is fun.	☐	☐	◂	▸
9. I enjoy learning new things in class.	☐	☐	◂	▸
10. When we work on something in class, I get involved.	☐	☐	◂	▸

*Permission to reprint not needed as measure is free in the public domain.

Appendix H: Identification with School Questionnaire (ISQ)*

Directions: We would like to know your thoughts about your school. When answering each statement, circle a number from (**1**) to (**4**), where (**1**) indicates you **strongly disagree** with the statement and (**4**) indicates you **strongly agree** with the statement.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. I feel proud of being part of my school.	☐	☐	◂	▸
2. I am treated with as much respect as other students in my class.	☐	☐	◂	▸
3. I can get a good job even if my grades are bad.	☐	☐	◂	▸
4. The only time I get attention in school is when I cause trouble.	☐	☐	◂	▸
5. I like to participate in a lot of school activities (for example, sports, clubs, plays).	☐	☐	◂	▸
6. School is one of the most important things in my life.	☐	☐	◂	▸
7. Many of the things we learn in class are useless.	☐	☐	◂	▸
8. Most of my teachers don't really care about me.	☐	☐	◂	▸
9. Most of the time I would like to be any place other than in school.	☐	☐	◂	▸
10. There are teachers or other adults in my school that I can talk to if I have a problem.	☐	☐	◂	▸
11. Most of what I learn in school will be useful when I get a job.	☐	☐	◂	▸
12. School is one of my favorite places to be.	☐	☐	◂	▸
13. People at school are interested in what I have to say.	☐	☐	◂	▸
14. School is often a waste of time.	☐	☐	◂	▸
15. Dropping out of school would be a huge mistake for me.	☐	☐	◂	▸
16. School is more important than most people think.	☐	☐	◂	▸

*Permission to reprint not needed as measure is free in the public domain.

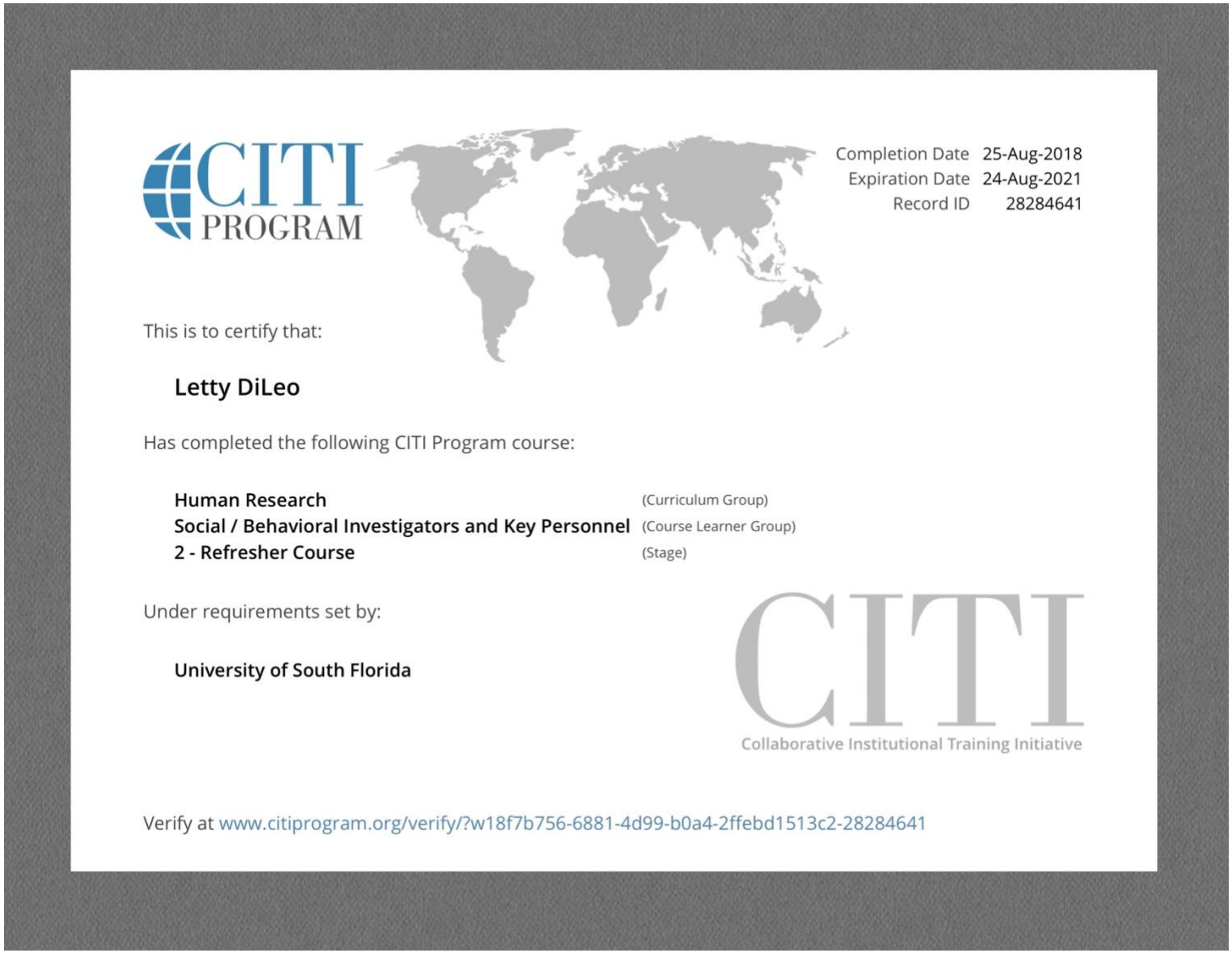
Appendix I: School Attitude Assessment Survey-Revised (SAAS-R)*

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

Statement:	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1. I am intelligent.							
2. I can learn new ideas quickly in school.							
3. I check my assignments before I turn them in.							
4. I am smart in school.							
5. I work hard at school.							
6. I am self-motivated to do my schoolwork.							
7. I am good at learning new things in school.							
8. School is easy for me.							
9. I want to get good grades in school.							
10. Doing well in school is important for my future career goals.							
11. I can grasp complex concepts in school.							
12. Doing well in school is one of my goals.							
13. I am capable of getting straight A's.							
14. I complete my schoolwork regularly.							
15. It's important to get good grades in school.							
16. I am organized about my schoolwork.							
17. I use a variety of strategies to learn new material.							
18. I want to do my best in school.							
19. It is important for me to do well in school.							
20. I spend a lot of time on my schoolwork.							
21. I am a responsible student.							
22. I put a lot of effort into my schoolwork.							
23. I concentrate on my schoolwork.							

*Permission to reprint not needed as measure is free in the public domain.

Appendix J: CITI Certificate



CITI PROGRAM

Completion Date 25-Aug-2018
Expiration Date 24-Aug-2021
Record ID 28284641

This is to certify that:

Letty DiLeo

Has completed the following CITI Program course:

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

Under requirements set by:

University of South Florida

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w18f7b756-6881-4d99-b0a4-2ffebd1513c2-28284641