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Health-Promoting Behaviors and Subjective Well-Being Among High School Students

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by

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DEDICATION

For my fiancé, Dr. Bethany M. Withycombe, and our love, that is abundant with joy, support, and hope for all that is to come. I am forever grateful for June 4th, 2017 and each day moving forward, with you. I am so thankful to have you always standing beside me in all our pursuits to achieve our goals. You are my inspiration!

"'On earth', Marguerite said, 'when you fell asleep, you sometimes dreamed your heaven and those dreams helped to form it. But there was no reason for such dreams now.'"

— Mitch Albom, *The Five People You Meet in Heaven*

"Cause when you love someone, You open up your heart

When you love someone, You make room

If you love someone, And you're not afraid to lose 'em

You'll probably never love someone like I do, You'll probably never love someone like I do"

— Lukas Graham, *Love Someone*

For any student, youth, parent, family, or person who I may serve during my career and for those who modeled service, throughout all my schooling and beyond. I am forever grateful.

"Brother, let me be your servant, Let me be as Christ to you.

Pray that I might have the grace, To let you be my servant, too.

When we sing to God in Heaven, We shall find such harmony

Born of all we've known together Of Christ's love and agony."

— Richard Gillard, *The Servant Song*

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-NDWS

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ABSTRACT

In positive psychology, a greater emphasis is placed on the presence of indicators of both physical and mental health. This study examined the relationship between 12 health-promoting behaviors and subjective well-being (SWB; e.g., happiness) in a sample of 450 high school aged youth from five high schools in two states. Participants reported on their dietary habits, physical activity, abstinence from tobacco products, abstinence from alcohol, and sleep hygiene (i.e., 8 unique components) as well as a multidimensional assessment of SWB (i.e., life satisfaction, positive affect, and negative affect). It was hypothesized that increased engagement in each of the health-promoting behaviors would be associated with higher levels of SWB. Based on identified differences in previous studies, demographic factors also were taken into consideration. Specifically, race, gender, and socioeconomic status were included in all analyses to further distinguish any main and moderating effects in relation to SWB and each health-promoting behavior. Findings demonstrated that seven of the 12 health-promoting behaviors examined were significantly correlated with SWB. A sizeable portion of the variance in SWB (39.80%) was accounted for by the linear combination of the 12 health-promoting behaviors. Increased physical activity, as well as two components of sleep hygiene (i.e., cognitive/emotional factors, bedtime routine) were unique predictors of the variance in SWB. None of the interactions with respect to race, gender, or SES and the health-promoting behaviors of interest were significant predictors of SWB, indicating that no moderating effects were identified in this study. Several unique main effects were identified for various health-promoting behaviors with respect to race and gender. However, no differences were unveiled with respect to SES. These

findings bring attention to the necessity to educate adolescents on the importance of daily physical activity, attention to sleep hygiene, and their links to mental wellness. Furthermore, these results provide a greater understanding of healthy profiles and their associations with positive mental health and demographic differences that exists. Future research should incorporate additional methods for investigating health-promotion, such as the utilization of sleep actigraphy monitors or qualitative interviews of adolescents and expanding upon the cross-sectional design of this study.

CHAPTER ONE:
INTRODUCTION

Statement of the Problem

A conceptual shift has occurred in the literature base on children and adolescents' physical (Kann et al., 2018) and mental health (Diener, 2000; Suldo, Thalji- Raitano, Kiefer, & Ferron, 2016). Specific to mental health conceptualization, assessment strategies and empirical studies previously adhered to a medical model and solely examined the presence or absence of various forms of psychopathology. Prior to this conceptual shift, many studies solely investigated children's internalizing (e.g., depression, anxiety) and externalizing (e.g., aggressive behaviors, conduct problems) symptoms, with minimal focus on positive indicators of mental well-being, or happiness. Recent literature has indicated that subjective well-being (SWB; Diener & Chan, 2011), a conceptual term for happiness, facilitates more positive outcomes across various domains and serves as a protective factor in those youth who exhibit co-occurring symptoms of psychopathology (Suldo & Shaffer, 2008; Suldo et al., 2016). Incorporating both subjective well-being and psychopathology factors provides a more comprehensive picture of functioning. Facilitating positive well-being is particularly important, based on the prevalence of children who display symptoms of some form of a mental health disorder (e.g., 25% of children meeting criteria for an anxiety disorder by the time they reach 3rd grade; American Psychiatric Association, 2013; Merikangas et al., 2009; Merikangas et al., 2010). Research has also identified that increased SWB is associated with greater physical health (Friedman & Kern, 2014; Kern, 2015; Suldo & Shaffer, 2008; Zullig, Valois, Huebner, Wanzer Drane, 2005) along

with other positive outcomes (e.g., social support, academic achievement; Suldo & Shaffer, 2008; Suldo et al., 2016).

In terms of the examination of physical health, a deficit focused approach was previously utilized with research primarily focused on risk taking or health-compromising behaviors (e.g., sedentary lifestyles, dietary fat intake; Centers for Disease Control and Prevention and Prevention, 2018; Kann et al., 2018; Levy, 2003), with less attention paid to children's engagement in behaviors that facilitate healthy outcomes (e.g., daily physical activity). Various health-related behaviors are linked and can be identified as either health-promoting (adaptive; e.g., daily physical activity; adhering to good sleep hygiene practices) or health-compromising (maladaptive; e.g., sedentary lifestyle; staying awake all night). Furthermore, adolescents engage in more health-compromising behaviors than any other age group of school-aged youth (Harris et al., 2005; Kern, 2015). Whereas, health promotion references to activities and habits that youth maintain to facilitate a healthy lifestyle (Friedman & Kern, 2014; Kern, 2015). The literature has indicated that it is vital for youth to develop healthy habits in terms of eating a balanced, nutritious diet, engaging in frequent exercise for at least one hour per day, and acquiring adequate amounts of sleep to allow for healthy growth and development. Furthermore, adolescence is a particularly salient time point during that youth may learn to identify and practice various health-promoting habits prior to leaving the home (Harris et al., 2005; Musavian et al., 2014; Persch et al., 2015). The increased sense of autonomy that takes place during adolescence, along with the growing obesity crisis in the United States make the promotion of health in all children and adolescents a necessity.

Despite the association between SWB and physical health (Friedman & Kern, 2014; Kern, 2015; Suldo & Shaffer, 2008; Zullig et al., 2005), few studies have examined if happiness

is associated with engagement in various health-promoting behaviors. The most commonly examined behaviors in previous studies have been a combination of diet and/or exercise habits (Blake et al., 2017; Holder et al., 2009; Mack et al., 2012). More recently, some literature has indicated the importance of examining the relationship between sleep-quality and well-being (Lai, 2018; Weinberg, 2016; Zhang et al., 2017). However, a comprehensive study incorporating multiple health-promoting behaviors and a comprehensive assessment of wellness is warranted. Also, although prior studies have been conducted throughout the lifespan, the current literature base lacks a study that has examined the association between various health-promoting behaviors and a comprehensive assessment of well-being in a sample of older adolescents (e.g., high school aged students).

Another benefit of further research between mental and physical health indicators could lead to the development of programs that could serve as preventive measures for those at risk for developing future mental (e.g., anxiety disorders) *or* physical health (e.g., childhood obesity) problems. This rationale is consistent with a public health framework of tiered service delivery (Blunden et al., 2016; Bourke-Taylor et al., 2012; Kobau et al., 2011). Also, the literature has identified that various demographic differences exists across health-promoting and health-comprising behaviors with respect to gender, race, and socioeconomic status (Center for Disease Control and Prevention, 2018; Craig et al, 2014; Hales et al., 2018; Spear & Kulbock, 2001). Therefore, clarifying these differences is vital for program development and to acquire an enhanced understanding of the links between mental and physical wellness.

Conceptual Framework

Pender's Health Promotion Model served as a conceptual framework for this study and general health promotion for adolescents (Pender, 2011). This model was developed in the

1980s for nursing practice and outlines the multidimensional nature of behaviors that contribute to and comprise a healthy lifestyle. This model aligns with a biopsychosocial orientation by examining the associations between various factors that contribute to healthy living, including physical activity, diet/nutrition and stress management. Pender's model also accounts for the goal-directed behavior self-care that individuals adhere to that promote a healthy lifestyle, which could be a unique factor to examine in adolescent populations. Additionally, the dual-factor model of mental health (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008 Suldo et al., 2016), a positive psychology framework, that emphasizes the importance of accounting for positive and negative indicators of mental health, provides a rationale for attending to and further studying and attending to the subjective well-being of adolescents.

Purpose of the Current Study

The goal of the current study was to examine the relationship between various factors of physical health (i.e., health-promoting behaviors including healthy diet, physical activity, factors of sleep hygiene, tobacco and alcohol abstinence) and positive mental health (i.e., subjective well-being). This study also examined the main and moderating role of various demographic characteristics on health-promoting behaviors and SWB, respectively.

The specific research questions included:

1. What is the relationship between specific health-promoting behaviors employed by adolescents (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence) and their subjective well-being?

2. What is the relationship between each of the health-promoting behaviors of interest in this study (e.g., significant correlation between physical activity and tobacco abstinence)?

3. After statistically controlling for race, gender, socioeconomic status, and school, that of the above health-promoting behaviors are most strongly related to the subjective well-being of adolescents?

4. To what extent, if any, are the relationships between adolescents' health-promoting behaviors and subjective well-being moderated by various demographic factors (gender, race, socioeconomic status)?

5. What are the relationships between gender, ethnicity, and socioeconomic status and each of the health-promoting behaviors?

Hypotheses

It was hypothesized that each of health-promoting behaviors would have a significant, positive correlation with the subjective well-being of high school aged youth. Specifically, it was expected that those who reported higher engagement in each of the specific health-promoting behaviors would also report increased levels of SWB. Additionally, it was hypothesized that each of the health-promoting behaviors would serve as a unique predictor of SWB. This rationale stems from the literature base that has indicated unique relationships between emotional well-being and various health-related behaviors including dietary practices, physical activity habits, sleep quality and attitudes about substance utilization (Blake et al., 2017; Gadermann et al., 2016; Holder et al., 2009; Lai, 2018; Levy, 2003; Lindberg & Swanberg, 2006; Mack et al., 2012; Piko, 2006; Shaffer-Hudkins, 2011; Weinberg et al., 2016).

Other hypotheses were in terms of demographic characteristics. Specifically, it was hypothesized that demographic differences would be identified in terms of the various health-promoting behaviors of interest. In terms of gender, this hypothesis stems from the idea that boys and girls hold themselves to various societal norms that impact their behaviors (i.e., girls

engage in fewer sports when compared to boys; Spear & Kulbock, 2001). Regarding comparisons between various racial groups, longitudinal research has identified differences in terms of physical activity, diet, and substance utilization (Center for Disease Control and Prevention, 2018). For example, binge drinking has been more commonly observed in white and Hispanic students when compared to African American students, regardless of gender. Last, socioeconomic status (SES) differences were hypothesized based on disparities that have been identified in the literature. For example, SES has been identified as a predictive factor in the amount of time that adolescents engage in physical activity (Elgar et al., 2015). Furthermore, the moderating effects of each demographic factor were explored in this study, to gain greater understanding of the interplay between these factors, health-promoting behaviors, and SWB. Various demographic findings are further expanded upon in chapter two to provide a rationale for the hypotheses pertaining to the main effect and moderating influence of various demographic factors.

Contributions to the Literature

A gap in this literature exists, as previous studies of health-promotion have primarily focused on adult populations (Donaldson et al., 2015). In terms of prior research in child and adolescent populations, Shaffer-Hudkins (2011) examined the relationship between various health-promoting behaviors and subjective well-being in a sample of middle school students. The study results indicated that various health-promoting behaviors (i.e., hours slept per night, attitudes towards substance utilization) were associated with increased levels of subjective well-being. The current study examined the relationship between mental and physical health through comprehensive, multidimensional measures of both factors (e.g., subjective well-being and various health related behaviors). This study also expanded upon the work of Shaffer-Hudkins

(2011) by including a more comprehensive sleep hygiene measure and a measure of alcohol and tobacco abstinence, as opposed to solely attitudes about substance utilization. Although various studies have examined the relationship between health-related and various indicators of wellness (e.g., physical well-being, emotional well-being; Blake et al., 2017), this study serves as the first comprehensive study to examine the relationship between multiple health-promoting behaviors and SWB in a sample of older adolescents. This research was warranted as literature has noted that the development of multicompetent interventions tailored at increasing engagement in multiple health-related behaviors is a necessity, based on the trivial effect sizes that are the product of currently existing interventions (Conner & Norman, 2017; Eaton et al., 2012). Findings from this study could be utilized to promote holistic health and the importance of assessing for positive mental health. Also, this study is the first study to examine the relationship between sleep hygiene factors (e.g., behaviors engaged in to facilitate quality sleep) and SWB in American adolescents, whereas prior studies have instead focused on sleep quality (e.g., restless sleep, nighttime arousal) and SWB (Gadermann et al., 2016; Weinberg et al., 2016; Lai, 2018). This study provided exploratory data relative to the relationship between physical wellness and mental health, that could be utilized for public health initiatives (Bourke-Taylor et al., 2012; Kobau et al., 2011 Harris et al., 2005; Musavian et al., 2014; Persch et al., 2015).

Definition of Key Terms

Subjective Well-Being (SWB; Diener, 2000) is a term that includes various cognitive and emotional components of well-being. SWB consists of a combination of life satisfaction (e.g., satisfaction and current circumstances), positive affect (e.g., joy, happiness), and negative affect (e.g., anger, shame; Suldo & Shaffer, 2008; Suldo et al., 2016). This study examined

SWB through a combination of participants' self-reported (a) levels of life satisfaction and (b) positive and negative adjectives that describe the daily feelings that they experience.

Health-Promoting Behaviors reference the daily habits and behaviors related to physical functioning that adolescents engage in that encourage and uphold quality physical health. Examples of health-promoting behaviors include: eating a nutritious diet (e.g., high in fruits, vegetables, and low in fats; Centers for Disease Control and Prevention; 2018), acquiring ample amounts of exercise (e.g., at least 60 minutes per day; Centers for Disease Control and Prevention; 2018), abstaining from tobacco or alcohol products (e.g., not drinking alcohol, not utilizing substances; Johnston et al., 2018), and obtaining sufficient sleep or facilitating a quality sleep cycle (e.g., obtaining at least 8.5-9 hours of sleep per night for high school students or having a standard bedtime routine; Paruthi et al., 2016). Engagement in these behaviors has been associated with disease prevention and decreased health-care cost (Mo & Winnie, 2010). Despite these positive findings, Chen (2007) has identified only 44.7% of American adolescents engage in multiple health-promoting behaviors and these behaviors decrease during the adolescent years (Rew et al., 2010). No published studies to date have assessed the relationship between any health-promoting behaviors and SWB in a sample of high school students. However, Conner and Norman (2017) identified healthy diet and exercise, are the most commonly studied health-related behaviors in the literature. Furthermore, Lai (2018) has noted the importance of examining the relationship between sleep quality and sleep hygiene with positive mental health. The current study utilized comprehensive self-reports of adolescents' dietary habits, physical activity habits, sleep hygiene, and abstinence from tobacco and alcohol products. Behaviors of interest were chosen based on the association in the literature indicating

an association of specific behaviors with SWB as well as the PI's ability to comprehensively measure each behavior.

Health-Compromising Behaviors reference the daily habits and behaviors that adolescents engage in that discourage and are detrimental to physical health. These are associated with decreased physical functioning and negative long-term outcomes, such as an increased risk of obesity, decreased quality of life, increased health care cost, and various psychosocial issues (Yang et al., 2014). These behaviors (e.g., illicit substance utilization, risk taking behaviors such as texting while driving) begin to increase during the adolescent years and have been identified at a greater incidence when compared to other age groups (Chen et al., 2007; Harris, 2005). These behaviors are more commonly examined in the literature pertaining to high school aged youth (Center for Disease and Control and Prevention, 2018). Commonly identified health-compromising behaviors include tobacco utilization, alcohol consumption, sedentary lifestyles, high fat diet, and poor sleep hygiene (Centers for Disease Control and Prevention, 2018; Conner & Norman, 2017; Harris et al., 2005).

CHAPTER TWO:

LITERATURE REVIEW

The purpose of this chapter is to provide a comprehensive review of the literature that relates to mental health, physical wellness, and the link between these two constructs. In addition, a rationale for examining positive indicators of both mental health (i.e., subjective well-being) and physical health (e.g., various health-promoting behaviors such as adhering to sleep hygiene recommendations) is provided. Specifically, examining positive indicators alters prior viewpoints that mirrored a medical diagnosis (Greenspoon & Saklofske, 2001; Seligman, 2000; 2002; 2011; Suldo & Shaffer, 2008), that solely assessed the presence or absence of pathology and placed little reference on the positive outcomes associated with well-being. One correlate of mental wellness that has been consistently identified is physical health (Diener & Chan, 2011), that is further discussed in this chapter. Although literature has identified associations, limited research has been conducted to examine if positive mental health is linked with engagement in various health-promoting behaviors. This chapter provides summaries of previous studies and methodologies that have examined positive and negative indicators of physical wellness as well as their empirical link with positive mental health and a rationale for embedding the positive psychology movement within health-promotion. Additionally, relevant theoretical frameworks are reviewed to further strengthen the rationale for this study. Finally, differences in terms of demographic features (e.g., gender, race, SES) and their impacts or lack thereof on physical and mental wellness are discussed.

Positive Indicators of Mental Health

Since the positive psychology movement of the early 2000's a greater emphasis has been placed on the promotion of wellness (Diener, 2000; Diener & Chan, 2011; Seligman, 2000; 2002; 2011). Service delivery that focuses primarily on the treatment of psychopathology limits the versatility of services by solely addressing the issue at hand, with little efforts provided to ensure that individuals are "flourishing" (Keyes, 2009), or experiencing positive mental health in tandem with quality interpersonal interactions. The treatment of these disorders with limited attention to well-being stems from a medical model that was previously utilized in the treatment of Veterans returning from World Wars I and II (Seligman, 2002, 2011; Suldo, 2016). Attending to indicators of wellness encompasses many factors: hope, resiliency, life satisfaction, positive affect, negative affect, and self-efficacy.

Subjective Well-Being Overview and Measurement

The current study sought to examine subjective well-being (SWB; Diener, 2000), a scientific term for happiness, and its relationship with various health-promoting behaviors. SWB references an individual's own personal appraisal of their life and current functioning across various domains. Literature that has examined SWB has traditionally conceptualized this variable as a combination of three separate but interrelated constructs: life satisfaction, positive affect (e.g., emotions), and negative affect (Diener, 2000; Diener & Chan, 2011; Suldo, 2016; Suldo & Shaffer, 2008; Suldo et al., 2016), yet early positive psychology research solely examined life satisfaction as a standalone construct. Life satisfaction references domain specific happiness (e.g., school, home) as well as global assessments of one's own life (e.g., "I am happy with my life."). Affect references mood and emotional states, whereas positive emotions include joy and delight, while negative affect emotions include distress, sadness, and anger (Laurent et

al., 1999). Diener and Seligman (2002) have noted those who indicate greater levels of personal happiness typically experience greater frequencies of positive emotions when compared to negative emotions. Within the combination of these factors, life satisfaction has been considered the more stable construct, as the experience of positive and negative emotions has been more subject to change over time.

Diener and Seligman (2002) have also emphasized that SWB is particularly pertinent to examine in Western cultures, primarily because a greater cultural emphasis is placed on individuals' level of functioning and personal successes, whereas other collectivist cultures may present a focus that is more holistically focused (e.g., family). Cultures that are more individualistic in nature emphasize each person's own level of quality of life and satisfaction with their life across various circumstances. Also, SWB strongly aligns with Seligman's (2011) PERMA theory, that transitioned the focus of positive psychology from a sole emphasis on experiencing positive emotions (i.e., life satisfaction) to a broadened framework referencing the importance of all individuals developing an enhanced form of well-being that is composed of five elements: positive emotions (P; SWB, life satisfaction), engagement (E; immersion within one's life), relationships (R; meaningful relationships with others), meaning (M; a sense of purpose) and accomplishment (A; sense of personal achievement). These factors have been associated with contentment (i.e., long term happiness) that has been associated with greater SWB throughout a lifetime.

Regarding the application of PERMA to physical health and well-being, Kern and colleagues (2015) completed a study examining the effect and intersection of positive emotions in a sample of 500 Australian boys. The results indicated that positive emotions, engagement, relationships/meaning, and accomplishment were related to vital outcomes, such as measures of

physical health. One of the key findings from this study was that all of the factors that were examined were found to be separate constructs, except for relationships and meaning, that were subsequently combined into one factor, based on the high levels of similarity between the two constructs. These findings indicated the measures of well-being were separate constructs, providing evidence for a multidimensional approach, all of that could lead to a wide variety of positive outcomes. For example, establishing a multidimensional approach for wellness can provide students with an opportunity as how to recognize and use their own personal strengths and instill an awareness of any personal weaknesses.

Another critical component of the literature is the individual components that influence happiness as identified by Lyubomirsky and colleagues (2005). Specifically, three distinct components have been stated to serve as the primary influences of happiness: genetic set point (e.g., stable biological factors), life circumstances (e.g., physical appearance, health condition, socioeconomic status), and intentional activities (e.g., positive or negative thoughts or activities, such as goal setting, optimistic thinking). When examining the significance of each component, genetic set point has been noted to comprise 50% of reported happiness. Specifically, longitudinal studies of reared twins identified stable biological factors and consistent personality traits related to happiness throughout the lifespan (Hamer, 1996; Nes & Roysamb, 2017). Purposeful activities, those that individuals decide to engage in, can contribute up to 40% of the variance in perceived levels of happiness (Lyubomirsky et al., 2005). Life circumstances been linked to 10% of the variance in levels of happiness. Few published works that have tested this framework exist. However, this framework is reviewed in this chapter to emphasize how an individuals' level of happiness and other outcomes may be affected through various components, such as life circumstances. Further examination into the specific purposeful activities (e.g.,

health-promoting behaviors) that an individual may engage in and their long-term impact on happiness is warranted.

In terms of the examination of SWB and quality of life, the literature has placed a greater emphasis on studies of adult populations, as opposed to youth and adolescent populations. Donaldson and colleagues (2015) noted that since the dawn of the positive psychology movement (i.e., early 2000s) there have been over 1,300 published studies, whereas a minority of these studies (16%) have focused on children and adolescent samples. One explanation for the limited focus on children and adolescents there is no gold standard measure for assessing children's subjective well-being as various methods have been noted in the empirical literature. For example, some studies have utilized a single indicator for well-being (Leung & Leung, 1992; Lindberg & Swanberg, 2006; Natvig et al., 2003). However, Diener (2000) has noted that SWB cannot be adequately assessed without comprehensive assessment of the three interrelated constructs: life satisfaction, positive affect, and negative affect.

Prior to the conceptualization of a multicomponent indicator of wellness (i.e., SWB), life satisfaction was commonly examined. The current gold standard for assessment of children's life satisfaction is the Student's Life Satisfaction Scale (SLSS; Huebner, 1991a; 1991b). The SLSS examines global life satisfaction with a thorough seven-item measure across various domains (i.e., satisfaction with self; satisfaction with school). A more comprehensive viewpoint can be obtained through the Multidimensional Students' Life Satisfaction Scale (MSLSS: Huebner, 1994), an empirically sound instrument assessing specific life domain satisfaction (e.g., friends, family, school) of youth and adolescents, while also providing a total composite. The Brief-Multidimensional Students Life Satisfaction Scale (Seligson et al., 2003) was designed to

serve as a more concise measure of the MSLSS. Each of these measures are free for public utilization and easy to incorporate into school-based practice (Suldo, 2016).

For the assessment of positive and negative affect, the other key components of SWB, the Positive and Negative Affect Schedule (PANAS: Watson, Clark, & Tellegen, 1988) was initially developed as a brief measurement of positive and negative affect for use with adult populations. Based on the need to assess these constructs in youth, the Positive and Negative Affect Scale for Children (PANAS-C: Laurent et al., 1999) was developed and validated in samples of children and adolescents. This measure includes 12 items related to positive affect and 15 items related to negative affect.

An area of concern that has been addressed in the literature is the fact SWB solely comes from one's own subjective interpretations. Therefore, it is vital to acknowledge the person's emotional state at the time of that an assessment is administered, that could have a positive or negative influence on the indicators of wellness. A longitudinal study of youth ages 17 to 21 indicated the long-term stability of SWB across three time points over a 12-week period (Eid & Diener, 2004). This study included measures of personality assessment and temporary mood ratings, that helped in examining any levels of mood change that participants may have experienced over this 12-week period. Additionally, Suldo and Huebner (2004) found a sample of 816 middle and high school students had consistent levels of life satisfaction over a one-year period (r = .56). Another concern that has been identified in the literature is the social desirability of participant's responses in terms of life satisfaction. However, the Students Life Satisfaction Scale has been reported to only have a correlation of .05 with measures of social desirability (Huebner, 1991a; 1991b), therefore indicating greater measurement validity and reliability in terms of self-report. In terms of SWB stability, Lepper (1998) had 971 individuals

self-report on their own level of SWB. Additionally, participant's romantic partner (or close family member) identified their own perception (e.g., other report) of the 971 individual's levels of SWB. Results of this study indicated that SWB was highly stable over a 9-month period with a strong agreement between both informants (SWB index stability coefficient= .73).

Research on SWB also has transitioned from examining that individual consistently report greater happiness to determining that factors contribute to perceived happiness. Various literature noted SWB varies across individuals of numerous backgrounds, demographic traits, and that perceived personal happiness is not tied to any specific indicator (Diener, 2000; Diener, Scollon, & Lucas, 2009; Huebner et al., 2006). Instead the collection of an individual's values, family life, and surrounding community all contribute to and are vital to examine when assessing SWB.

SWB Serving as a Protective Factor for Children and Adolescents

Individual's levels of SWB in everyday life have been demonstrated to correlate with various positive outcomes (Diener, 2000). Specifically, attending to the SWB of youth early in their schooling can serve as a protective factor in terms of mental health promotion (Greenspoon & Saklofske, 2001; Smith, 2018). O'Connor and colleagues (2017) have emphasized that positive mental health during the adolescent years is particularly vital as it can serve as a necessary asset that youth can utilize to meet the various demands they face during this developmental period (e.g., academic challenges, social functioning, romantic relationships), that is predictive of smoother transitions into adulthood across various domains. Ensuring the positive development of youth also is critical as approximately 25% of youth meet criteria for some form of psychopathology upon reaching third grade (American Psychiatric Association, 2013; Merikangas et al., 2009; Merikangas et al., 2010).

Recent literature has shown SWB can serve as a protective factor when assessed in tandem with psychopathology (e.g., internalizing or externalizing symptoms; Antaramian, 2015; Eklund et al., 2012; Smith, 2018; Suldo & Shaffer, 2008; Suldo et al., 2016). The examination of both constructs of mental health has been coined the Dual Factor of Mental Health (Suldo & Shaffer, 2008; Suldo et al., 2016). Findings from these studies further strengthen the rationale to promote and incorporate the assessment of wellness in theoretical frameworks and clinical practice. This model has been identified in samples of elementary (Greenspoon & Saklofske, 2001; Smith, 2018), middle (Antaramian et al., 2010; Suldo & Shaffer, 2008), high school (Suldo et al., 2016), and college students (e.g., Antaramian, 2015; Eklund et al., 2011; Renshaw & Cohen, 2014). When utilizing this framework, four mental health groups are consistently established: complete mental health, vulnerable, symptomatic but content, and troubled (Suldo, 2016; Suldo & Shaffer, 2008; Suldo et al., 2016). Differences (e.g., physical health, academic achievement) have been noted between each of the group, particularly between the groups that are comprised of similar levels of psychopathology or subjective well-being (e.g., both those identified as having complete mental health or vulnerable have low levels of psychopathology). Descriptions of these groups and the positive outcomes associated with increased levels of SWB are provided to champion the protective nature of this construct, when compared to groups that report diminished levels of wellness.

The first subgroup, those identified meeting criteria for "Complete Mental Health" (CMH; approximately = 65% of prior samples), possess average to high levels of SWB and low to average levels of psychopathology, when compared to the other mental health groups (Suldo, 2016). These students generally demonstrate greater physical health (Suldo & Shaffer, 2008) and higher perceptions of social support (Antaramian et al., 2010; Greenspoon & Saklofske,

2001; Lyons et al., 2012; Smith, 2018; Suldo & Shaffer, 2008; Suldo et al., 2016), amongst other outcomes. Another mental health group, "Vulnerable" (approximately = 12.1%, but ranges from 8-19% in previous samples), are those students who have low levels of both SWB and psychopathology (Suldo, 2016). Those identified in this group have demonstrated worse physical health (Suldo et al., 2016) and lower grades (Antaramian, 2015; Eklund et al., 2011; Renshaw & Cohen, 2014; Suldo & Shaffer, 2008; Suldo et al., 2016) when compared those with Complete Mental Health (who have average to high levels of SWB). Students identified in this mental health group rarely receive school based mental health services when methods utilized to identify solely psychopathology are utilized.

A third mental health "Troubled" (approximately = 12.8% of prior studies), report diminished levels SWB and high levels of psychopathology (e.g., clinically "at risk levels"; Suldo, 2016). These individuals meet the traditional medical model criteria for poor mental health. These children have the worst outcomes regarding physical health (Suldo & Shafer, 2008) when compared to the other groups. The final mental health group identified through the utilization of this model are those identified as "Symptomatic but Content" (SBC; approximately = 10.1% of prior samples; Suldo, 2016). These individuals are identified based on their preeminent levels of both SWB and psychopathology. When compared to peers who also have elevated levels of psychopathology (i.e., troubled), positive outcomes have been identified (e.g., increased physical health, social functioning), indicating increased levels of SWB are related to more positive outcomes (Smith, 2018; Suldo & Shaffer, 2008; Suldo et al., 2016). Identifying those in this group is cumbersome based on the protective factor of SWB, that may mask psychopathology related behaviors. The expanding literature pertaining to this dual factor model has emphasized that those identified has having "complete mental health" often have the best

outcomes, but those identified as SBC also have benefits, that is attributed to the protective nature of SWB. This model is summarized in Figure 1.

Levels of Psychopathology	Level of SWB	
	Low	High
Low	Vulnerable	Complete Mental Health
High	Troubled	Symptomatic but Content

Figure 1. Mental Health Status-Dual Factor Model of Mental Health (Suldo, 2016)

Based on the interest of this study in high school students and physical health outcomes, a summary of a dual factor model study is provided to further explain the relevance of SWB. Suldo and colleagues (2016) sought to examine the dual factor model of mental health in a diverse population (34% Hispanic; 50% Free and Reduced Lunch) of 500 American youth from two high schools 9th through 11th grade (14 to 18 years old; *M*= 15.27 years old). This study examined the influence of mental health status in relation to academic attitudes, perceptions of physical health, identity development, social support, and romantic relationship satisfaction.

The results of between-group comparisons were consistent with prior research, whereas adolescents who met criteria for complete mental health (i.e., average to high SWB) reported greater academic self-perceptions, social adjustment, and increased satisfaction with their physical health than those students that were classified into the vulnerable mental health group (i.e., low levels of SWB and low to average levels of psychopathology symptoms). Additionally, those students who were classified into the SBC mental health group had greater academic self-perceptions, attitudes towards school, health satisfaction, self-concept, self-esteem, and meaningful activity involvement, when compared to their peers with comparable levels of psychopathology (i.e., troubled adolescents). Also, these students had greater perceived social support from parents, classmates, teachers, as well as increased romantic satisfaction and less

peer victimization as compared to those students classified as troubled. In sum, in the described sample of high school adolescents, SWB has been associated with various positive outcomes across multiple domains, all of that are relative to school success. Taking this literature into account with the various other studies examining both SWB and psychopathology and interrelated constructs, the importance of examining both is championed. Therefore, this study provides evidence for beneficial outcomes in a sample of high school youth, the target population of this proposed study.

The Relationship Between Physical Health and Subjective Well-Being

One factor identified in the literature that positively correlates with SWB is physical health (Diener & Chan, 2011). Bray and colleagues (2004) have proposed that increased SWB serves as a protective factor against anxiety, that decreases the arousal of the sympathetic and parasympathetic automatic nervous systems, and in turn strengthens the connection between these systems and the immune system, endocrine system, and subsequently physical health in children with chronic anxiety. Kobau and colleagues (2011) have emphasized how positive emotions have beneficial impacts in terms of physical health: decreased risk of disease, illness, and injury, and in turn is predictive of longevity. Increased levels of SWB are associated with greater physical health and longevity of life and that positive emotions are associated with better immune system functioning, quicker recovery from illness, and increased longevity of life (Diener, 2000; Moor et al., 2014). Positive emotions have also been linked to more favorable physical health outcomes. For example, Carver and Scheier (1993) indicated that optimistic coronary artery bypass surgery patients recovered quicker throughout their first six months than their non-optimistic peers, while laugher has been associated with increased immune system functioning (Mahony et al., 2002).

Diener and Chan (2011) conducted a literature review examining the relationship between positive mental health and mortality and found that increased SWB was associated with greater life expectancy in 26 studies published between 1989 and 2010. This phenomenon was found to be present across various populations including New England residents (Kubzansky et al., 2001), Dutch (Koopmans et al., 2001), Scandinavians (Lyrra et al., 2006), Mexican Americans (Ostir et al., 2000), and Japanese adults (Shirai et al., 2009). Diener and Chan (2011) also referenced 17 studies published between 1996 and 2009 that examined the relationship between specific illnesses and SWB. The overwhelming finding across these studies indicated that SWB was predictive of illness, particularly disease progression in cardiovascular disease (Nabi et al., 2008). Other illnesses included in this review that had a relationship with levels of SWB were cancer (Hamilton et al., 1996), psychiatric disorders (Koivumaa-Honkanen et al., 2004), diabetes (Shen et al., 2008), and high blood pressure (Ostir et al., 2001). However, it was noted that no causal links can be drawn between the studies reviewed by Diener and Chan (2011) based on their reported study design.

A study completed by Suldo and Shaffer (2008) sought to identify differences in physical health outcomes (e.g., general health perceptions, bodily pain) in a sample of 349 American middle school students (6^{th} through 8^{th} grade). This study grouped students based on their levels of SWB and psychopathology aligned with the dual-factor model of mental health. Tukey post hoc comparison tests indicated differences between groups with similar levels of psychopathology (i.e., CMH and vulnerable; SBC and troubled). Specifically, groups that reported average to high levels of SWB (i.e., CMH= 4.12, SBC=3.81) reported higher general health perceptions scores on the Child Health Questionnaire-Child Form 87 (CHQ-CF87;

Landgraf et al., 1999) when compared to those groups that reported low levels of SWB (i.e., Vulnerable=3.71, Troubled=3.29).

Furthermore, Shaffer-Hudkins and colleagues (2010) found in a follow-up study of the same data set that SWB was identified as the most prominent predictor ($\beta = .25$) of reported physical health, as compared to psychopathology (i.e., internalizing and externalizing concerns). Similarly, as described earlier, SWB was found to be associated with constructs of physical health (i.e., health satisfaction, activity limitations as measured on The Children's Health and Illness Profile-Adolescent Edition [CHIP-AE; Starfield et al., 1995]; Suldo et al., 2016) in a sample of high school students whereas the dual factor model of mental health was utilized to distinguish the positive nature of increased SWB. Both studies incorporated comprehensive measures of physical wellness and SWB (i.e., affect and life satisfaction components).

Friedman and Kern (2014) identified the Correlated Outcomes Model that provides a theoretical rationale for the links between SWB and reported physical health and how these factors are longitudinally associated with lifestyle patterns serving as mediating variable. Core components of this model include positive associations between SWB and reported physical health over multiple time points of an individual's life. The role of life style patterns mediates the influence between both factors. Genetic predispositions serve as a theoretically moderating variable for the relationship between SWB and reported physical health. Interestingly, this model also accounts for the impact of biomedical interventions on sustaining physical health. The origin of this model stems from an eight-year study of 900 adult individuals during that poor physical health was predictive of decreased life satisfaction, whereas decreased life satisfaction was not in turn predictive of poor physical health across multiple time points (Gana et al., 2013). These researchers rationalized that based on how life satisfaction serves as a core construct of

SWB, it may be in turn linked to physical wellness, from a bottom up viewpoint. This model is displayed in Figure 2.

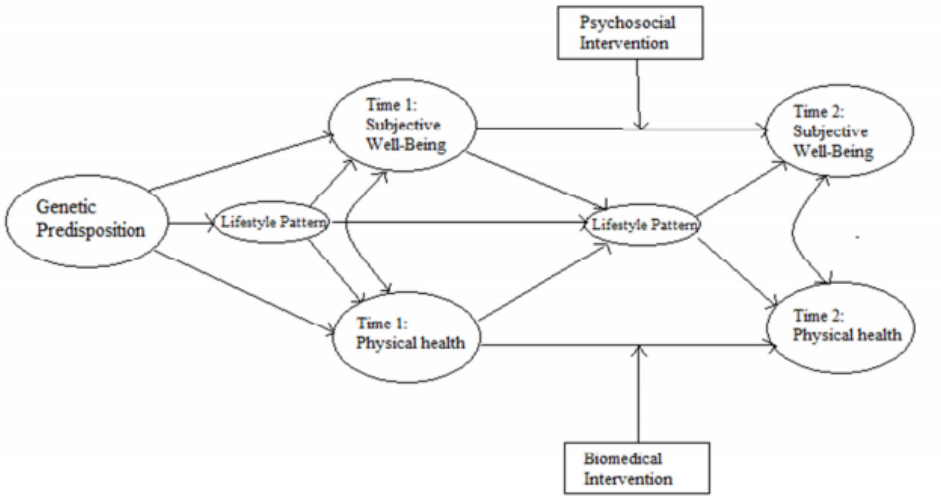

Figure 2. Correlated Outcomes Model (Friedman & Kern, 2014).

In sum, subjective well-being is a positive psychology construct that has revealed various beneficial outcomes (i.e., social support, physical health) in studies of youth and adolescents (Kern et al., 2014; Suldo & Shaffer, 2008). From initial studies that solely examined life satisfaction to the more comprehensive categorization practices of utilizing the dual factor model of mental health, it is clear the application of positive psychology concepts (i.e., PERMA) is becoming embedded within the literature. Per Suldo (2016), the literature pertaining to the well-being of youth and adolescents has vastly expanded throughout the 21st century and further research should examine correlates that are associated with well-being. This study hopes to provide evidence of potential links between indicators of physical and mental health.

Health-Related Behaviors and Physical Functioning

Various daily behaviors exhibited by humans are linked to mental and physical health outcomes. In terms of physical health, both "health-promoting," those that facilitate physical

health, and "health-compromising behaviors," those that inhibit physical health, have been identified in the literature. These viewpoints mirror the positive (i.e., SWB) and negative indicators (i.e., psychopathology) that have been examined in mental health research (Keyes, 2002; 2009). The current literature base provides an understanding of various behaviors, a conceptualization of both promoting and compromising behaviors, and the outcomes that are associated with engaging in both types of behaviors.

Similar to the medical model that has been utilized in mental health research, prior research on health behaviors focused solely on health-compromising behaviors, particularly in adolescent populations as substance utilization has become a more prevalent over time (Lynch et al., 2015). Additionally, the focus on dietary practices has also been extensively examined in tandem with the obesity crisis throughout all age demographics in the United States (Elbert, Dijkstra, & Rozema, 2017). The Youth Risk Behavior Surveillance System (YRBSS; Centers for Disease Control and Prevention and Prevention, 2018) is the most commonly used tool to assess student's engagement in health-comprising behaviors among high school students. The YRBSS includes a national school-based, state, and local surveys, that are state and local surveys that are utilized to identify the prevalence rates of adolescent behaviors as well as inform public policy and improve programs. Specifically, tobacco use, alcohol and other substance use, risky sexual behaviors, unhealthy dietary practices, physical inactivity, and risk behaviors that contribute to unintentional injury and violence are all thoroughly examined. The data collected from the administration of this survey has been complied into a longitudinal data set that currently provides data from 1991 through 2017. Surveys are distributed every two years and the school response rate (75%; 2017) and student response rate (81%; 2017) has been consistently high. The most recent data collected included a sample of public, Catholic, and other non-public

schools with students in at least one of the high school grades (9th through 12th grade; 14,956 students in 144 schools) in each of the 50 states and the District of Columbia. Over 40 journal articles have been published since 2013 utilizing this dataset.

The Centers for Disease Control and Prevention (2018) indicated at least 50% of adolescents consistently engage in at least one of these health-compromising behaviors, yet the trends of engagement in various behavior have been rather mixed over time. More specifically, in terms of risk-taking behaviors, 39.20% of high school student participants nationwide indicated they had texted or e-mailed while driving during the 30 days prior to survey completion (as compared to the 62.8% who indicated they drove a car or other vehicle during the 30 days prior to the survey; Center for Disease Control and Prevention, 2018). Also, although the trends in sexually active teens has decreased within the last 10 years (48% in 2007; 40% in 2017), the utilization of various contraceptive methods (e.g., condoms) has decreased from 62% (2007) to 54% (2017) within the last decade. In terms of substance utilization, alcohol use (29.8%), marijuana use (19.8%) and the utilization of a substance that was not prescribed (14%) were the most prevalent as of the last YRBSS administration (Center for Disease Control and Prevention, 2018). In addition, illicit substance utilization has also decreased (e.g., use of cocaine, heroin, inhalants) from 2007 reports (23% vs 14% in 2017). However, one in seven high school students reported the utilization of prescription opioids in 2017, that is associated with an increased risk for further substance dependency long term. Various literature has attributed this trend to the opioid crisis that currently exists in the United States (Centers for Disease Control and Prevention, 2018; Johnston et al., 2018).

Regarding nutrition and exercise, sedentary activities (e.g., video game and/or computer use for 3+ hours a day for activities not school or work related; Kann et al., 2018) were endorsed

by 43% of participants who completed the Youth Risk Behavior Survey (YRBS), a representative household-based survey that is imbedded within the YRBSS. Also, 15.4% of participants had not engaged in physical activity for a total of at least 60 minutes on at least 1 day during the 7 days prior to the survey. Finally, in accordance with the national childhood obesity crisis, a significant portion of respondents were identified as obese (14.8%; >95th percentile for body mass index) or overweight (15.6%; > 85th percentile for body mass index). Various health-compromising behaviors have been associated increased rates of psychopathology, including depression (Yu et al., 2017).

The purpose of this YRBSS census is to assist in the formulation of policy and program development to promote health and well-being for the entire population. However, Eaton and colleagues (2012) indicated various school-based health promotion programs have a minimum effect at reducing health-compromising behaviors in that adolescents engage, particularly in terms of the long-term engagement. These authors also noted that many prevention and intervention programs solely focus on one behavior and there is a need for programs that promote holistic health and engagement in multiple health-promoting behaviors. Therefore, an approach that champions the promotion of wellness is warranted. Harris and colleagues (2005) have noted that schools serve as an optimal place to promote health decision making in students based on the ability to deliver services to all students within a public health framework. Kobau and colleagues (2011) have also referenced that interventions tailored at increasing SWB align with a public health perspective. Specifically, SWB could be increased through organizational structures as opposed to tailoring interventions solely at the individual level. This viewpoint promotes the widespread utilization of positive psychology interventions to increase the quality of the human experience and supports a full spectrum of wellness with both mental and physical

health components. Additionally, the promotion of SWB, positive mental health, and the links between mental and physical wellness could help contribute to a reduction in stigma regarding mental illness.

In line with a positive psychology approach, health-promotion will be discussed with greater breadth and depth based on the focus of the proposed study. Health promotion has been defined by O'Donnel (2009, p. iv) as "the art and science of helping people discover the synergies between their core passions and optimal health, enhancing their motivation to strive for optimal health, and supporting them in changing their lifestyle to move toward a state of optimal health. Optimal health is a dynamic balance of physical, emotional, social, spiritual, and intellectual health." Conner and Norman (2017) have championed further health promotion exploration based on the complexity and long-lasting impact of physical health and behavioral patterns throughout the lifespan. Based on this literature, further exploration is needed in terms of positive mental health, particularly in adolescent populations. Although health-compromising behaviors have been more frequently examined and assessed in adolescent populations (Centers for Disease Control and Prevention; 2018; Kann et al., 2018; Spear & Kulbock, 2001), there is a growing literature base that supports the need to assess for these adaptive behaviors (Musavian et al., 2014; Persch et al., 2015). Some more commonly assessed health-promoting behaviors include adhering to a healthy and nutritious diet (e.g., includes ample servings of fruits and vegetables), and engaging in regular exercise (e.g., at least one hour of physical activity per day; Bourke-Taylor et al., 2012; Conner & Norman, 2017). Practicing good sleep hygiene habits (e.g., at least 8 hours of sleep per night for an adolescent; Lemola, Ledermann, & Friedman, 2013; Weinberg et al., 2016) has been more recently identified in the literature, as more is discovered about sleep habits and disorders.

It is vital for adolescents to engage in various health-promoting behaviors (Harris et al., 2005; Musavian et al., 2014; Persch et al., 2015). Specifically, due to the increased cognitive capacity and rapid changes in mind and body (e.g., onset of puberty, and desire for autonomy), this is a time point when adolescents could begin the practices of certain routines (e.g., healthy diet and exercise practices). Engagement in various health-promoting behaviors prior to leaving home could facilitate continuous practice throughout the lifespan. However, Harris and colleagues (2005) have noted adolescents engage in more risk-taking behaviors when compared to any other age groups. Therefore, although the literature has identified there is an increased frequency of these behaviors, adolescents also are capable of developing skills to manage their own behaviors with a greater capacity, and in turn decrease the frequency of these behaviors and comply with healthier lifestyle choices.

Prior research by Pender, Murdaugh, and Parson (2005) has led to the development of a theoretical framework that examines the various cognitive, affective, and social factors that contribute to an individual's lifestyle in terms of health-promotion and in turn physical health. Rather than focusing on disease prevention alone, this model seeks to examine measures taken to ensure quality physical health. Pender (2011) has referenced the key concepts that serve as the basis for the Health Promotion Model including the person (e.g., a biopsychological organism that can be shaped by their environment), the environment (e.g., social, cultural, and physical context of an individual's life that can be manipulated in terms of health by health-promoting or compromising behaviors), health (e.g., an individual's goal directed behaviors, competent self-care, satisfying relationships, adjustments made in response to environmental factors, and an ever evolving human experience), and illness (e.g., either acute or chronic that impair overall health). The examination of these factors is vital when evaluating the likelihood of engaging in

health-promoting behaviors and the individual's own sense of self-efficacy, or individual beliefs pertaining to their ability to be successful at a task. This theoretical framework was initially developed during the 1980's to enhance the ability of nurses to promote health and well-being, whereas also examining factors that could have a negative impact on one's lifestyle (e.g., social influences). Pender's Health Promotion Model is displayed in Figure 3.

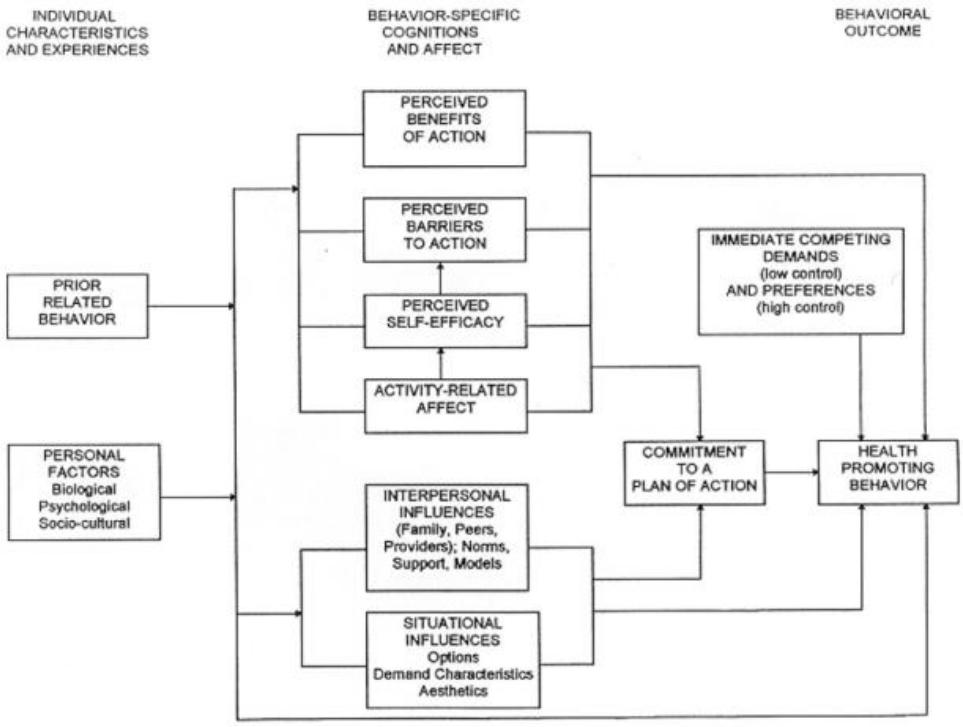

Figure 3. Pender Health Promotion Model (Pender, 2011).

Research in terms of this theoretical underpinning has been primarily focused on adult populations, with over 100 published studies incorporating Pender's Health Promotion Model (Srof et al., 2002). However, less emphasis has been placed on the examination of this model in children and adolescents (Garcia et al., 1995; Garcia et al., 1998; Pender et al., 2002; Wu & Pender, 2002) as there are few peer reviewed studies. One study completed by Ayres and Pontes (2018) sought to further investigate Pender's Health Promotion Model in a convenience sample of 122 United States adolescents who resided in an urban neighborhood (13-18 years old).

Results from this study found a positive correlation between health responsibility and neighborhood order perception (e.g., thoughts and feelings about safety factors related to neighborhood). These findings led to further interpretation of this theoretical model as illustrating that if an adolescent feels that their neighborhood has more order than disorder, as well as more embedded resources, engagement in health-promoting behaviors is more feasible (e.g., exercise). Whereas, crime and drug trafficking in more disorganized or less socially supportive neighborhoods might deter from exercising in one's neighborhood, if at all. Therefore, this study mirrors the theoretical perspective of Pender and the premise that many factors influence one's ability to engage in various health-promoting behaviors.

Measurement of Health-Promoting Behaviors

Throughout the 21st century the most commonly studied health-related behaviors were substance utilization (e.g., cigarette smoking, illicit drugs, alcohol), sexual and contraceptive behaviors, risk taking behavior (e.g., texting when driving, emailing when driving, seat belt use), as well as nutritional practices and exercise habits (Conner & Norman, 2017; Spear & Kulbock, 2001). However, a consistent trend has been the examination of a single health behavior (Holder et al., 2009; Lai, 2018; Mack et al., 2012; Weinberg et al., 2016), with few studies providing a comprehensive examination of a combination of health-promoting behaviors (Blake et al., 2017; Levy, 2003; Shaffer-Hudkins, 2011). Also, the measurement method of specific behaviors has varied across studies that is described for each health-related behavior below. More recently, the development and utilization of consistent measures that are valid and reliable in the measurement of health-promoting behaviors are examined.

A measure that has been cited within the literature that comprehensively assesses health-promoting practices is the Adolescent Health Promotion Scale (Chen et al., 2003; AHPS). The

original questionnaire included 40 items that examined six constructs of healthy behavior: nutrition (e.g., "I eat three meals daily"), exercise behavior (e.g., "Warm up before rigorous exercise), social support (e.g., "Make an effort to have good friendships"), health responsibility (e.g., "I watch my weight"), life appreciation (e.g., "I smile or laugh every day."), and stress management (e.g., "I make an effort to watch my mood changes") on a 4-point Likert scale. The Adolescent Health Promotion Scale-Short Form (AHPS-SF; Chen et al., 2014) was recently developed to provide a more concise, yet still comprehensive assessment of the various health-promoting behaviors. This 21-item measure has yielded adequate reliability and validity with the original measure (Chen et al. 2003) construct validity, convergent validity, discriminant validity, and internal consistency. Despite the various behaviors that are examined within these measures, the assessment of sleep and abstinence from substance utilization cannot be overlooked in terms of the impact of these health behaviors on SWB.

One of the more commonly studied health-promoting behaviors is in the form of physical activity (Yao & Ryan, 2015). A variety of measures have been utilized to measure this construct: self-report measures for engagement in physical activity (Berge et al., 2014; Yao & Ryan 2015), activity logs, and direct observations of movement (Dowda et al., 2011), while youth have worn an accelerometer or heart rate monitors tracking their movement (Langer et al., 2014; Lawman & Wilson, 2014; Yao & Ryan 2015). Each of these forms of measurement attempts to identify the nature, duration, and frequency of physical activity during a specific time (e.g., throughout the course of a week, or during the past month). Despite the depth of these forms of measurement, many studies have solely incorporated parent report measures for outcome variables (Alderman et al., 2010; Loprinzi et al., 2010; Loprinzi et al., 2013; Yao & Ryan, 2013). Sirard and colleagues (2013) identified that self-report measures have adequate

reliability and validity in high school students, regarding their physical activity levels based on a study that examined the correlations between various self-report measures of physical activity, Accelerometer data and weight measurements.

Dietary habits are another frequently assessed health-related behavior (Tabacchi et al., 2014), especially due to the increased levels of obesity that exist in the United States. However, Tabacchi and colleagues (2014) indicated a gold standard of measurement for this behavior is lacking. This behavior is often studied in tandem (e.g., either in the same study, same measure, or different measures) with physical exercise in various studies. Johnson and colleagues (2002) found that most measures examine nutritious intake through various measures including dietary records, food frequency questionnaires, and dietary recall. Hann and colleagues (2001) identified that self-report measures of diet typically include measures of fats, proteins, fruits, and vegetables. Body mass index, self-reported snacking, and temptation to eat have also been tailored into various measures. Some literature exists that has indicated recalling dietary practices may be difficult based on the retrospective nature of these practices, the sensitivity of various measures (e.g., within the last 30 days) and general underestimation of consumption or overestimated adherence to healthy diet practices (Albar et al., 2016; Jiang et al., 2014). Daily adherence to self-report food logs also have been difficult to implement. There are measures that exist, such as the Adolescent Food Habits Checklist (AFHC; Johnson et al., 2002), that seeks to assess participant's general perceptions of their dietary habits (e.g., "If I am having lunch away from home, I often choose a low-fat option."), as opposed to within a specific timeline or a focus on the amount of a particular food that is ingested.

Another commonly examined health-related behavior in youth is illicit substance utilization. Various large-scale studies are conducted each year to monitor engagement in these

health-compromising behaviors, such as the YRBSS (Centers for Disease Control and Prevention 2018) that has been previously described in this chapter. Monitoring the Future (MTF) is another longitudinal study (N = 43,700 students in 360 high schools across the nation) that seeks to examine substance utilization in adolescents through survey research (Johnston et al., 2018). The utilization of substances is considered a health-compromising behavior based on the long-term negative health impacts (e.g., lung cancer and tobacco products). However, examining this behavior from the viewpoint of individuals own refusal to engage in these behaviors could be studied in the context of health-promoting behaviors (i.e., abstinence; low scores on measure assessing substance utilization). Shaffer-Hudkins (2011) sought to examine adolescents' perceptions and beliefs as they pertained to substance utilization, based on the age of the sample size (6th through 8th grade students) and the hypothesized low rates of exposure to and utilization of illicit substances. Perceptions of substance utilization is incorporated into studies that examine younger populations, based on their limited exposure to these behaviors (Mrug et al., 2010). In this study, abstinence from utilization of alcohol and tobacco products was examined with the intent to increase the understanding of the relationship between refraining from substances and self-reported levels of SWB, aligned with a health-promoting perspective.

Since the turn of the 21st century, the importance of sleep and its relationship to mental health, relationships between decreased sleep quality and increased levels of childhood psychopathology or behavioral issues have been identified (Alfano et al., 2009; Wolfson et al., 2015). Measures of adolescent sleep patterns and hygiene are infrequently included in empirical studies. Ji and Liu (2016) conducted a literature review and indicated there are currently 13 self-report or parent-reported sleep measures that have strong psychometric properties. Specifically, this review indicated that six measures were generic instruments that assessed for overall sleep

quality and frequency of nighttime disturbances. Another five measures were dimension-specific (e.g., daytime sleepiness, sleep hygiene), and two measures were insomnia focused instruments. Each of the measures that were discussed in this literature review were focused on assessing sleep and related information in youth ages 11 to 18 years old.

In terms of specific sleep disorders, the Children's Sleep Habits Questionnaire (CSHQ: Owens, Spirito, & McGuinn, 2000) is a 40-item measure that assesses various components of children's sleep habits including: nutritional behaviors, exercise behaviors, social support, stress management, health responsibility, and life appreciation. The Sleep Disorders Inventory for Students (SDIS: Luginbuehl et al., 2008) was developed for school-based practice to assist in the screening of students who may be experiencing symptoms of the most common sleep disorders (e.g., obstructive sleep apnea syndrome, narcolepsy, restless leg syndrome; Owens et al., 2000). A strength of this measure is the use of unique child and adolescent report forms and computer-based score reports with recommendations to facilitate a higher quality night's sleep. Both the CSHQ and SDIS rely solely on parental report. Various measures have identified the patterns that youth engage in to facilitate a quality night's sleep (e.g. bedtime, regular sleep-wake schedule). An example of a domain specific measure, the Adolescent Sleep Hygiene Scale (Lebourgeois et al., 2005) is a 33-item measure assessing sleep hygiene across eight subscales (bedtime routine, substances, daytime sleepiness, stability, physiological, behavioral arousal, cognitive/emotional factors, and sleep environment factors) that is completed by adolescents in a self-report format. This was the only assessment tool that was included in this review that was specifically focused on sleep hygiene practices. In sum, the literature indicates the assessment of sleep disorders and disturbances has been heavily conceptualized through parental report measures, while sleep hygiene may be assessed through an adolescent self-report measure.

Researchers have indicated various health-related behaviors may be interrelated, despite their individual conceptualization in the literature (Busch et al., 2013; Spear & Kulbock, 2001). For example, Busch and colleagues (2013) found in a sample of 2,690 Dutch high school students, clusters of health-compromising behaviors (i.e., alcohol use, drug use, risky sexual behavior, and sedentary lifestyle) were found to be predictive of long-term negative health and psychosocial outcomes. In a nationally representative sample of over 11,000 high school students, those who engaged in low physical activity (i.e., less than two days engaging in exercise) were also at increased risk to report diets that had low rates of fruits and vegetable consumption (Heath et al., 1994). Therefore, further research into the relationship between these variables (i.e., global versus specific assessment of various health related behaviors; relationships between health-promoting behaviors) and their association with positive mental health sis warranted.

Prior Studies of Health-Promoting Behaviors and SWB: Transitioning Towards a Model of Comprehensive Wellness

The positive psychology movement can be strongly embedded within the health psychology discipline to develop methodologies that allow for an encompassing assessment of wellness (Kobau et al., 2012). Various literature (Harris et al., 2005; Persch et al., 2015) has emphasized that healthy habits have positive long-term developmental impacts throughout the lifetime, therefore continued research is needed. A summary of studies that have previously examined the relationship between various combinations of health-promoting, health-compromising, and health-related behaviors and some measurement of well-being is provided below. Interestingly, the literature base is surprisingly scarce in older American adolescent samples, particularly as this is the age group where a high incidence of health-compromising

behaviors occurs (e.g., substance utilization, risk-taking behaviors; Harris et al., 2005; Persch et al., 2015; Li et al., 2012).

Levy (2003)

Levy (2003) examined the relationship between health-related behaviors and SWB in a sample of 457 undergraduate students (M = 19 years old). To comprehensively examine the health-related behaviors of interest, Levy included measures of health-compromising behaviors (i.e., risky sexual behaviors, substance utilization, drinking and driving,) and health-promoting behaviors (i.e., exercise, healthy diet, responsible drinking, protective sexual behaviors, sleep regimen). Well-Being was measured through two scales: The Satisfaction with Life Scale (SWLW; Diener et al.,1985) and the Index of Psychological Well-Being (Berkman, 1971), that is a measure designed to examine mental health in the general population. Findings showed that a combination of all the health-related behaviors (e.g., comprising and promoting) and psychological variables (e.g., depression, fighting) in this study accounted for 28% of the variance in life satisfaction and 40% of the variance in emotional well-being. The combination of health-promoting behaviors was particularly salient in predicting differences in the variance in life satisfaction (R^2 = .08, p <.001). The described measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Lindberg and Swanberg (2006)

Lindberg and Swanberg (2006) conducted in a sample of 807, 6th grade Swedish students (across 18 schools) examined psychological well-being and its relationship with a host of psychosocial factors, including various health-promoting behaviors (e.g., dietary habits, safety habits). Participants completed a singular question (e.g., “How are you these days?”) that served as the indicator of well-being. Specifically, participants were dichotomized as either having

good well-being (i.e., endorsing "very well," or "rather well") or poor well-being (i.e., endorsing "neither good, nor poor," "rather poor," or "very poor"). These researchers also assessed dietary habits (i.e., four questions pertaining to a fruits, vegetables, and healthy snacks consumption) and safety habits (i.e., three questions pertaining to bicycle helmet and seat belt utilization).

Regression analyses indicated that safety habits were not predictive of increased levels of well-being (Lindberg & Swanberg, 2006). However, eating behaviors, with five other psychosocial variables assessed (e.g., relation to school, relation to parents) were associated with increased levels of well-being (odds ratio OR = 3.01, p <.001). The findings from this study indicated an association between a health-promoting behavior (i.e., dietary practice) and increased levels of SWB. Therefore, replication in an American sample is warranted, particularly with a more comprehensive, valid assessment of psychological wellness, that the current study sought to emulate. The described measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Piko (2006)

Piko (2006) examined the predictive ability of self-perception of health-related behaviors (i.e., dieting practices, substance utilization, regular exercise) and participants' perceived life satisfaction, as identified by completing Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). This study was conducted with a sample of 1,114 secondary students (M = 16.5 years old, range of 14-21 years old) in Hungary. Regarding the reporting of perceived health, a revised version of the Children's Depression Inventory (Kovacs, 1992) was tailored to include various questions that were related to the health-related variables of interest. Specifically, the measure provided a question pertaining to tobacco use, substance use, and alcohol use during the past three months. The measure also included two questions pertaining to

diet and exercise practices during the past three months. Therefore, a singular question was utilized for each of the examined health-related behaviors.

The results of this study indicated that dieting practices were positively associated with increased life satisfaction and predictive of 12% of the variance, while smoking was negatively associated with decreased life satisfaction and predictive of 6% of the variance (Piko, 2006). Exercise habits, alcohol use, and substance utilization were not associated with life satisfaction in this study. Throughout this review of the literature, studies that incorporate comprehensive measures that serve as indicators of wellness (e.g., physical and mental health) are needed to examine this complex relationship. The described measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Holder and colleagues (2009)

Holder and colleagues examined various health-related behaviors and well-being in a sample of 375 elementary school children (8-12 years old). This study sought to examine physical activity habits of youth through the inclusion of both parental and participant perceptions of their engagement in "active leisure activities (i.e., participation in sports, a health-promoting behavior)" and "passive leisure activities (i.e., screen time, a health-compromising behavior)". The assessment of these behaviors was assessed through a series of 10 questions on a non-standardized measure that was developed for utilization in this study: six of the questions were focused on active leisure activities (e.g., 'Last week, how many hours did you do athletic activities?, 'How involved are your parents in your athletic activities?') and four of the questions were focused on passive leisure activities (i.e., 'How many hours last week did you spend watching television?'; 'How many hours did you talk on the phone?'). Parents completed a separate form that had questions that were specifically tailored to their perceptions (e.g., "Child's

sports ability", "Importance of child's participation in a sport."). In terms of the measurement of well-being, both parents and youth participants utilized the Faces scale (Holder & Coleman, 2008; Likert scale of positive and negative emotionally based faces) to indicate their feelings on a Likert scale.

Findings indicated that when considering parental and youth perceptions, active leisure activities were positively related with well-being while passive leisure activities were linked to decreased perceptions of well-being (Holder et al., 2009). Multiple regression analyses for youth perceptions indicated that a significant portion (16%) of the variance in well-being could be attributed to the combination of participants responses on three questions: "Your sports ability," "Importance of sports to parents," and "Sports make you feel," with the latter question being a standalone significant predictor (6% of the variance). Parental perceptions of children's participation in physical activity was only predictive of 3% of the variance in well-being, with the question "Importance of child in a sport (2%)" serving as the only significant predictor. In terms of engagement in leisure activities, neither parent or youth perceptions of engagement in leisure activities contributed to the variance in levels of well-being. This study provides insight into interrelated health-promoting and health-compromising behaviors, that should be replicated in other samples, with more encompassing measures. The described measures utilized to assess well-being and the various health-promoting behaviors are summarized in Table 1.

Shaffer-Hudkins (2011)

Shaffer-Hudkins (2011) examined the relationship between multiple health-promoting behaviors and SWB in a sample of 246 American middle school students in perhaps the most comprehensive study to date in a sample of youth. In this study, participants completed self-report measures of dietary habits, physical activity, sleep hygiene, safety habits, and their

attitudes towards substance utilization. The SWB variable was a composite of scores on the SLSS (Huebner, 1991a; 1991b) and the PANAS-C (27 items version; Laurent et al., 1999) and various health-promoting behaviors of interest were included in the study design (i.e., diet, exercise, sleep hygiene, perceptions of substance utilization, risk taking behaviors).

The findings from this study indicated that increased amounts of sleep per night and attitudes toward substance utilization were significantly correlated with participants reported levels of SWB (Shaffer-Hudkins, 2011). Specifically, when examining the linear combination of the five health behaviors, these accounted for 15% of the variance in SWB. However, attitudes towards substance utilization was the only significant predictor. Shaffer-Hudkins (2011) also sought to examine the influence of specific demographic characteristics (e.g., race, SES, gender) on SWB, yet no significant main or moderating effect interactions were noted. The described measures utilized to assess SWB and the various health-promoting behaviors utilized by Shaffer-Hudkins are summarized in Table 1. This study did have certain limitations in terms of the sample that was collected (e.g., 80% were categorized as Caucasian) and all the participants were enrolled at one school. The current proposed study hopes to mirror components of the study completed by Shaffer-Hudkins (2011) to further enhance the understanding between various health-promoting behaviors and a comprehensive assessment of well-being. However, the researcher recruited a sample size that was larger and more diverse. Also, based on the age group of interest for the current study, other empirically validated measures that provided a more comprehensive viewpoint were able to be utilized.

Mack and colleagues (2012)

Mack and colleagues (2012) examined the relationship between health enhancing physical activity and various forms of well-being. Specifically, these researchers incorporated

outcome variables in the forms of hedonic well-being (HWB; aligned with SWB; comprised of life satisfaction, positive, and negative affect) and Eudemonic Well-Being (EWB; Ryff, 1989). EWB references an individual's ability to reach their true potential and has been linked with engagement in activities that challenge one's abilities. EWB has been conceptualized across domains: life purpose, environmental mastery, personal growth, positive relationships with others, autonomy, and self-acceptance.

This study involved multiple phases (6 months apart) and included data collection at two separate time points (Time 1, N = 243; Time 2, N = 198) in samples of undergraduate females (Time 1: M = 18.61 years old, SD = 1.05 years; Time 2: M = 19.76 years old; SD = 2.21) enrolled at one university (Mack et al., 2012). This sample was primarily comprised of students who identified as Caucasian (92.20% of sample). At each time point during this study, participants completed the Short Questionnaire to Assess Health-Enhancing Physical Activity Scale (Squash; Wendel-Vos et al., 2003) that provides a total score for activity level across various domains (e.g., activities at work or school, household activities). Hedonic Well-Being was assessed through a combination of measures: The Satisfaction with Life Scale (SWLS; Diener et al., 1985) and the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). EWB was assessed through participants' scores on the Scales of Psychological Well-Being (SPWB; Ryff, 1989) that has been utilized to examine EWB and its six core components described above.

The results at the first time point indicated that increased levels of health enhancing physical activity were associated with increased levels of HWB and EWB (Mack et al., 2012). Also, this same trend was observed during the longitudinal portion of the study, whereas changes in health enhancing physical activity between the two time points were associated with increases

in HWB and EWB. However, health related physical activity predicted a significant portion of the variance for each of the following constructs: HWB-satisfaction with life (R^2=.11), HWB-positive affect (R^2=.15), HWB-negative affect (R^2=.03), EWB-positive growth (R^2=.08), and EWB-purpose in life (R^2=.11). The authors noted based on the cross-sectional nature of the design, it was cumbersome to determine the directionality of these behaviors. Specifically, the authors reference similarities with Lyubomirsky and colleagues (2005) who identified that those who reported higher SWB typically engage in greater amounts of physical activity. In sum, these findings provide further evidence for the importance of a singular health-promoting behavior (i.e., physical activity) and the positive link between multiple forms of well-being (i.e., HWB, EWB) in a sample of early college students at multiple time points. The described measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Gadermann and colleagues (2016)

Gadermann and colleagues (2016) examined the association between various health-related behaviors and life satisfaction in a sample of 5,026 Canadian 4th grade students (M=9.70 years old) from 121 elementary schools. Additionally, components of connectedness with adults and peers in the school were incorporated into this study design. Participants in this study completed the Satisfaction with Life Scale adapted for Children, that was based on Diener's (1985) satisfaction with life scale. Additionally, participants completed ratings of their overall health (i.e., single question on a 4-point Likert scale), nutrition (i.e., two items on a 5-point Likert scale), sleep (i.e., one item on a 5-point scale), physical activity (i.e., reported their participation in physical activity after school throughout the school week), and each were adapted from the BC Adolescent Health Survey (McCreary Centre Society, 2008). Each

participant also completed ratings of their levels of connectedness with adult and peers that were adapted from previous measures (California Healthy Kids Survey—Middle School Questionnaire; Constantine & Benard 2001; Relational Provisional Loneliness Questionnaire [RPLQ]; Hayden-Thomson 1989).

Using structural equation modeling, increased levels of life satisfaction were found to be predicted by breakfast frequency and after school team sports participation (Gadermann et al., 2016). Junk food frequency and later bedtime were significant predictors of decreased life satisfaction. In terms of overall physical health, both the health-related behaviors and the connectedness variables were found to be significant predictors of physical health. It was emphasized that within the various models embedded within this study, those that included connectedness variables contributed to a greater portion of the variance (life satisfaction = 26%, physical health = 15%), when compared to the models with health related-behaviors and activities (life satisfaction=4%, physical health = 6%). The authors identified the cross-sectional nature of this design as a limitation and championed for future research to be conducted in this area based on the positive impacts that both social support and health-related behaviors had on children's emotional well-being and self-reported levels of health. The described measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Weinberg and colleagues (2016)

Weinberg and colleagues (2016) examined the influence of sleep quality on well-being in a sample of 488 Australian young adults (77% female; *M* = 28.71 years old, *SD* = 10.61 years). These participants were recruited through various social media online venues (e.g., Facebook, LinkedIn) and the authors indicated many of the participants in this study were full time students but did not provide specific information of the degrees or education level being sought. A series

of self-report measures were utilized to obtain information pertaining to participant's duration of sleep, dreams during the past week, well-being, and stress level, that was hypothesized to be a mediating factor within this study design. Specifically, participants completed the Personal Well-Being Index (International Well-Being Group, 2013) that is a 7-item measure, with the primary purpose of determining the life satisfaction of participants across various domains. This measure utilizes an 11-point Likert scale for each question to comprehensively assess perceptions of life satisfaction, an essential component of SWB. In terms of sleep quality, an altered version of the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989), a 19-item measure that assesses sleep quality and disturbances, was utilized. Lastly, participants indicated if they had experienced a bad dream during the prior week. Participants were then categorized into three groups based on the following criteria: participants who experienced nightmares during the past week (N = 139), participants who only reported experiencing bad dreams during the past week (N = 64), or participants who reported experiencing no bad dreams during the past week (N = 271).

The results of this study indicated the average score of well-being was lower in this sample, when compared to the average score of the Australian population (Weinberg et al., 2016). Also, the results of the path analysis indicated poor sleep quality was associated with decreased levels of well-being (β = -.43, p<.001). Additionally, when stress was incorporated into the mediating analysis, the relationship was still significant, indicating that the combination of poor sleep and stress contributed to decreased feelings of SWB (β= -.25, p<.001), and 29.1% of the variance in SWB was attributed to the linear combination of these variables. To further evaluate this relationship, each of the respective dream groups was compared. A series of ANOVA's and post hoc comparison tests indicated that those who indicated they had nightmares

during the previous week had diminished levels of SWB when compared to the other two groups. Also, those who were identified as having nightmares also had poorer sleep quality when compared to those who did not report frequently experiencing nightmares or bad dreams during the past week. The authors identified further research in this area is important based on the high prevalence of sleep disorders that often go unidentified in children (18-25% of general population; Owens et al., 2000; Owens et al., 2000). Also, the authors identified that further research examining both sleep quality (e.g., time spent in various sleep stages, obtaining adequate amounts of REM sleep) and sleep hygiene practices (e.g., maintaining a consistent bedtime) is warranted. However, there is currently a lack of empirically based interventions that can be utilized to facilitate greater sleep hygiene. In sum, these findings indicated sleep duration and quality both have a relationship with Australian adults' levels of SWB. The measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Blake and colleagues (2017)

Blake and colleagues (2017) examined the relationship between various health-promoting behavior and SWB in an adult sample. The authors rationalized the engagement in health-promoting behaviors should be continuous throughout the life time, as chronic illnesses, disability, and other symptoms of some illnesses can be more regulated through a healthy lifestyle. Another goal of this study was to examine the impact of race and income on engagement in various behaviors. Participants in this study included 456 adults (M = 50.7 years old, SD = 11.97 years; 50% male; 44% completed a post-baccalaureate degree) who completed a series of online surveys as part of a larger research study (Graf & Patrick, 2014; 2015) that sought to examine the sexual attitudes and sexual health literacy of adults. The sample was diverse in terms of race (i.e., 25.9% African American, 19.1% Hispanic). In terms of health-

promoting behaviors, participants completed the Nutrition (9 items) and the Physical Activity (8 items) subscales of the Health-Promoting Lifestyle-Profile (HPLP II: Stark et al., 2010), that are both set to a 4-point Likert scale. Participants also completed three indicators of physical well-being, that assessed their global health that was taken from the Medical Outcomes Study Short Form-12 Health Survey (MOS SF-12; Ware et al., 1996). Regarding SWB measures, participants completed the Philadelphia Geriatric Center (PGC) Positive and Negative Affect scales (Lawton et al.,1992), a 10-item measure, with two five items subscales, respectively referencing positive and negative affect. Last, participants completed an unspecific global happiness measure that consisted of one item on a 7-point scale (M = 5.07, SD= 1.31).

Using structural equation modeling, a significant portion of the variance in emotional well-being (21%) was based on diet or exercise practices (Blake et al., 2017). Interestingly, these authors indicated that physical activity was found to be predictive of emotional and physical well-being, while healthy dieting practices was only predictive of emotional well-being. Therefore, it was emphasized that examining the longitudinal impact of each of these factors is warranted. In terms of demographic findings, both educational attainment and income were each related to perceptions of physical well-being, that path model analysis indicated that engagement in physical activity contributed to this indirect effect. In terms of emotional well-being, only income was predictive of differences in this sample, while no other demographics yielded any significant interactions. Regarding the engagement in both health-promoting behaviors, age, educational attainment and income, were predictive of healthy eating habits. Similarly, educational attainment and income were associated with a greater likelihood to engage in physical activity. The authors attributed these findings to the relationship between education and income with more resources, allowing for healthier lifestyle practices. In sum, this study

provides a greater understanding of the relationship between physical and mental wellness, the utilization of online survey methods to collect self-report data, and the importance of examining various demographic features. The measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

Lai (2018)

Lai (2018) examined the influence that sleep quality had on the relationship between personality (e.g., "Big Five" personality factors; Steel et al., 2008) and SWB (Lai, 2018). The participant data analyzed for this study was part of the larger Australian Household, Income, and Labor Dynamics Survey, a longitudinal study that collects national data in all adolescent citizens 15 years of age and older. The sample that was utilized in this cross-sectional study included 13,424 adult participants (53%; male *M*= 44.30 years old, *SD*= 18.20 years; range = 15-101 years old). In terms of SWB, participants completed a single item measure of life satisfaction (i.e., "All things considered, how satisfied are you with your life?"; Lucas and Donnellan, 2012) that was set to an 11 point-Likert Scale, as well as the Medical Outcomes Scale Short Form Health Survey (SF-36; Ware & Sherebourne, 1996) that is a nine-item measure of positive and negative affect, set to a 4-point Likert scale. The Pittsburg Sleep Quality Inventory (Buysse et al., 1989) was utilized to measure sleep quality. For the purposes of the described study, the five primary personality traits were assessed through utilization of a 36-item personality inventory developed by Saucier (1994).

The results indicated that sleep quality did have an impact on both personality traits and SWB (Lai, 2018). Specifically, in terms of SWB, decreased sleep quality was significantly predictive of the described variables: decreased life satisfaction ($\beta = -.23$), decreased positive affect ($\beta = -.31$), increased negative affect ($\beta = .31$). Each of the 11 direct paths from the various

personality traits to SWB remained statistically significant (β = –.33 to .30, p < .05) when global sleep quality was included in the model as a mediating factor. Therefore, the results of this study indicated the importance of obtaining adequate, quality sleep, that is associated factors of well-being but also personality, in a large representative sample of Australian adults. The authors of this study noted how examining the longitudinal stability of these factors as well as testing interventions through experimental designs is warranted in future research. The measures utilized to assess SWB and the various health-promoting behaviors are summarized in Table 1.

In sum, the review of the described studies has identified various associations between multiple health-related, health-comporting, and health-promoting behaviors on participants' positive indicators of mental health (e.g., SWB; Blake et al., 2017; Gadermann et al., 2016; Holder et al., 2009; Lai, 2018; Levy, 2003; Lindberg & Swanberg, 2006; Mack et al., 2012; Piko, 2006; Shaffer-Hudkins, 2011; Weinberg et al., 2016) in various samples throughout the lifespan. The measures utilized to assess SWB and the various health-promoting behaviors in each of the described studies are summarized in Table 1. Despite these positive findings, further examination of these variables through comprehensive measures is warranted. Specifically, reviewing this relationship in a sample of older American adolescents is warranted, based on the lack of a that assess multiple health-related behaviors, as well as the prevalence of obesity, substance utilization (Centers for Disease Control and Prevention, 2018), and as knowledge of sleep disorders and the importance of sleep hygiene is enhanced (Alfano et al., 2009; Ji & Liu, 2016; Wolfson et al., 2015). Further investigation of multiple health-promoting behaviors (as opposed to solely one) can help in understanding how each contributes to SWB. Last, addressing health promotion during the adolescent years based on their autonomy, ability to make wise decisions,

and proximity to transitioning out of the home, provides further justification for this rationale (Harris et al., 2005; Persch et al., 2015; Li et al., 2012).

Demographic Influences on Physical Health Indicators

To comprehensively examine the relationship between mental wellness and health-related behaviors, it is vital to examine various demographic characteristics that could have an influence on the strength and direction within various relationships. Three primary demographic characteristics have been identified that yield differences between various subgroups within the realms of physical health, mental health, and health promotion, socioeconomic status, ethnicity, and gender (Craig et al, 2014; Hales et al., 2018; Spear & Kulbock, 2001). In terms of demographic differences with respect to SWB, few have been identified in the existing literature and it is generally conceptualized as a stable construct across all persons (Diener, 2000; Diener, Scollon, & Lucas, 2009; Huebner et al., 2006). However, since many studies have had samples that are primarily comprised of Caucasian youth, the continuous evaluation of this comprehensive assessment of well-being is warranted in diverse samples to uncover any distinguishable variances.

Gender Differences in Terms of Health-Related Behaviors

Spear and Kulbock (2001) have identified that gender and race are two of the most well-established indicators in terms of health-related behaviors. Although the most common health-related behaviors that are studied are diet and physical activity, certain health-promoting behaviors have been found to be more strongly associated with one gender as opposed to the other. The Centers for Disease Control and Prevention (2018) indicated that approximately 3 out of every 10 high school students meet criteria for at least 60 minutes of physical activity each

Table 1. Prior Studies of Health Promoting Behaviors and SWB

Study	Sample	Measure of SWB	Health-Promoting Behaviors and Measurement
Levy (2003)	457 American undergraduate students (M = 19 years old)	Well Being: The Satisfaction with Life Scale (SWLS; Diener et al., 1985) Index of Psychological Well-Being (Berkman, 1971).	National College Health Assessment Survey (ACHA-NCHA, 2000): General Health and Safety Alcohol and Drug Use Sexual Behaviors and Perceptions Weight, Nutrition, and Exercise Physical and Mental Health Impairments to Academic Performance
Lindberg & Swanberg (2006)	807 6th grade students from Sweden across 18 schools	SWB: A singular question (e.g., "How are you these days?")	Dietary and Safety Habits: Modified version of the WHO Health Behaviour in School-Ages Children Study and the Youth Self-Report Questionnaire (YRBS).
Piko (2006)	1,114 Hungarian secondary students (M = 16.5 years old)	Life Satisfaction: Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985).	Diet, Exercise, and Substance Utilization: A revised version of the Children's Depression Inventory (Kovacs; 1992) parent and child report) that included components of diet, exercise, and substance utilization.
Holder et al., (2009)	375 American Elementary School Students (8-12 years old)	Well-Being: Youth and Parent Report on the Faces scale (Holder & Coleman, 2008)	Physical Activity: Researcher designed parent and participant report measures (6 items) that examined active leisure activities.

Table 1 (continued).

Study	Sample	Measure of SWB	Health-Promoting Behaviors and Measurement
Shaffer-Hudkins (2011)	246 American middle school students (6^{th}- 8^{th} grade)	Life Satisfaction: Student Life Satisfaction Scale (Huebner, 1991b) Affect: PANAS-C (27 items version; Laurent et al., 1999) positive and negative affect scales.	Dietary Habits and Physical Activity: Nutrition and Exercise Survey for Students (NESS; Curtis, 2005), Sleep and Safety Habits: Sleep and Safety Habits Questionnaire (Researcher Developed Measure) Attitudes Towards Substance Utilization: Attitudes Towards Substance Use Scale (Developed from the Pro-Drug Self-Report Questionnaire; Kovach Clark et al., 2010).
Mack et al. (2012)	Multiple time points (Time 1, N = 243; Time 2, N = 198) samples of undergraduate females (Time 1: M = 18.61 years old; Time 2: M = 19.76 years old)	Life Satisfaction: Satisfaction with Life Scale (SWLS; Diener Emmons, Larsen, & Griffin, 1985) Affect: Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988).	Physical Activity: Short Questionnaire to Assess Health-Enhancing Physical Activity Scale (Squash; Wendel-Vos et al., 2003)
Gadermann et al. (2016)	5,026 Canadian 4^{th} grade students from 121 elementary schools (*M*=9.7 years old)	Life satisfaction: Satisfaction with Life Scale adapted for Children (Gadermann et al., 2011)	Overall Health, Nutrition, Physical Activity, and Sleep: Questionnaire adapted from the from the BC Adolescent Health Survey ; McCreary Centre Society, 2009).

Table 1 (continued).

Study	Sample	Measure of SWB	Health-Promoting Behaviors and Measurement
Weinberg et al., (2016)	Australia sample of 488 young adults (77% female; M = 28.71 years old, SD = 10.61 years)	SWB: Personal Well-Being Index (International Well-Being Group, 2013)	Sleep Quality: Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989)
Blake et al. (2017)	456 Adults (M = 50.7 years old)	Life satisfaction: unspecific global happiness measure (1 item, 7 point scale). Affect: Philadelphia Geriatric Center (PGC) Positive and Negative Affect scales (Lawton et al.,1992)	Nutrition and Physical Activity: Health-Promoting Lifestyle-Profile (HPLP II: Stark et al., 2010; Nutrition and Physical Activity subscales) Global Physical Wellness: Three items pertaining to global physical wellness taken from the Medical Outcomes Study Short Form-12 Health Survey (MOS SF-12; Ware et al., 1996).
Lai (2018)	13,424 adult participants (53%; male M= 44.30 years old, SD= 18.2 years; range = 15-101 years old)	Life Satisfaction: A single item measure of life satisfaction (Lucas & Donnellan, 2012) Positive Affect: Medical Outcomes Scale Short Form Health Survey (SF-36; Ware & Sherebourne, 1992)	Sleep Quality: The Pittsburgh Sleep Quality Index (Buysse et al., 1989)

day, while 15.4% of students report not being physically active for at least 60 minutes during one day in the previous week. Both factors have been associated with the obesity epidemic that currently exists in American youth. Multiple studies have identified that males engage in more physical exercise when compared to females and this phenomenon has been observed in samples of middle school (Wu et al., 2006), high school (Vilhjalmsson & Kristjansdottir, 2003; Robinson & Killen, 1995), and college students (Craft et al., 2014) and adults (Chalavaev et al., 2013). Common forms of exercise that boys have indicated they frequently engage in include team sports (e.g., football, basketball) while females who do endorse physical activity are more likely to endorse engaging in cardiovascular related activities (e.g., swimming; Pate et al., 2004).

In terms of maintaining a healthy diet, girls have been found to tailor their dietary practice in ways that promoted weight loss and maintenance, while adolescent boys were more likely to adhere to a diet that facilitated weight gain (e.g., high in protein; McCreary & Sasse, 2002; Robinson & Killen, 1995; Spencer et al., 2015). Similarity, adolescent boys have been found to consume a higher fat diet (65% had a diet that consisted of 30% or more fat; Neumark-Sztainer et al., 2002) when compared to adolescent girls. Regarding dietary practices, the Centers for Disease Control and Prevention (2018) indicated that 5.6% of students had not eaten fruit or 100% fruit juices during the past week prior to survey completion, while 18.8% of surveyed adolescents indicated they had eaten fruit three or more times, each day, during the past seven days. Specifically, males were identified as being more likely to have avoided consuming fruit or 100% fruit juices (7.2%) when compared to females (4.0%). Similarly, 59.4% of students indicated they had eaten vegetables one or more times during the past seven days prior to the survey, while 7.2% of students did not eat vegetables (e.g., salad, carrots) during the seven

days prior to the survey. These findings were more prominent in adolescent males (8.9%) than females (5.5%)

Regarding gender differences pertaining to sleep quality and hygiene, Galland and colleagues (2017) examined sample of 692 Australia adolescents (*M*=16.9 years old) and noted that girls were more likely to engage in poor sleep hygiene practices and in turn had decreased overall sleep quality when compared to boys. In terms of specific pre-sleep behaviors that were impairing, 66.1% of girls in the sample reported drinking caffeinated beverages after dinner, while only 44.5% of boys engaged in this behavior. Organek and colleagues (2015) noted that in a sample 1543 middle school student (51.1% girls, *M* = 12.31 years old), boys reported obtaining a significantly greater amount of sleep per night (8.52 hours) when compared to girls (8.15 hours). These authors noted that the earlier onset of female puberty could be a factor that influenced these findings. Despite these findings that have indicated differences in terms of sleep hygiene, literature has indicated that males are a greater likelihood to be diagnosed with a sleeping disorder, obstructive sleep apnea disorder (e.g., almost four times as likely; Owens et al., 2000) when compared to females throughout their lifetime.

Substance utilization is a health-compromising behavior that has been associated with gender differences (Kloos et al., 2009; Kuhn, 2015). Early substance use and dependence into adulthood has been identified in males at an alarmingly increased rate, with rates almost twice as high for alcohol dependence or abuse (10.3% of males, 5.1% of females in those 12 years of age and older) and illicit drug dependence or abuse (3.7% of males, 2.0% of females in those 12 years of age and older; Kloos et al., 2009). Males have been found to increase their utilization at a much faster rate, with greater associations in addiction as opposed to recreational use (Kuhn, 2015). However, when specifically examining adolescents, distinguishing differences have been

less clear. Various literature has identified that substance utilization had increased in adolescent females within the last decade (Kloos et al., 2009; Kuhn, 2015). Interestingly, females have various protective factors throughout their life that limit the increased utilization of these substances long term into adulthood (e.g., hormonal changes, greater self-regulation as age increases, decreased rates of impulsivity and sensation seeking behaviors with age; Kuhn, 2015). In terms of cross-cultural comparisons that further emphasize gender differences, multiple studies of United States and United Kingdom adolescents have indicated that adolescent males are more prone to drinking alcohol whereas females are more likely to utilize tobacco products (National Centre for Social Research, 2008; Webb et al., 2000).

Ethnic Differences in Terms of Health-Related Behaviors

Various literature examined the differences and disparities in health behaviors across ethnic groups and identified disparities. For example, African American students were identified as less likely to utilize tobacco products, when compared to Caucasian students (Kann et al., 2018). This same phenomenon was identified by Gutman and colleagues (2011) in a sample of 1472 families who were measured across five time points over a seven-year period (1991-1998). Additionally, these researchers found that tobacco and substance use was not only more prominent, but faster occurring in Caucasian families when compared to African American families. The national prevalence of binge drinking (i.e., having four [female], five [male], or more drinks of alcohol in a row within a couple of hours on at least 1 day during the 30 days) was 13.5% of all adolescents enrolled in 9th grade (Centers for Disease Control and Prevention, 2018). Binge drinking was more commonly observed in Caucasian (15.7%) and Hispanic (14.0%) male students when compared to African American males (5.6%). A similar trend was observed in females, whereas white (15.9%) and Hispanic females (16.0%) engaged in this

behavior at a greater frequency than their African American peers (6.8%; Centers for Disease Control and Prevention, 2018).

In terms of physical activity, various findings have been identified in terms of racial differences. For example, Sirard and colleagues (2008) found that in a sample of 1,903 South Carolina 8th grade girls, African American girls reported less physical activity, decreased aerobic fitness levels, increased sedentary lifestyle activities (e.g., television watching), and in turn a higher body mass index (BMI), when compared to their Caucasian counterparts. The researchers attributed this to the fact that a greater frequency of the Caucasian girls participated in more after school sports than their African American peers. Zeno and colleagues (2010) have identified this to be a consistent trend in samples of adults. In contrasts, the most recent YRBSS data of high school youth indicated limited differences as 48.7% of Caucasian youth, 44.9% of Hispanic youth, and 42.0% of African American youth were physically active at least 60 minutes per day for five or more days (Centers for Disease Control and Prevention, 2018). However, the same data indicated that a greater percentage of African American high school youth (35.2%) engage in at least three hours of television watching per day, when compared to Hispanic (20.7%) and Caucasian (17.7%) youth.

Regarding dietary practices, the Centers for Disease Control and Prevention (2018) has indicated that the percentage of youth who had not consumed adequate amounts of fruits or fruit juices was higher among Caucasian (7.1%), African American (9.5%), and Hispanic male (6.3%) when compared to Caucasian (4.1%), African American (4.4%), and Hispanic females (3.7%). In terms of not consuming vegetables, discrepancies were apparent as a higher portion of African American (14.9%) and Hispanic males (11.1%) did not consume vegetables when compared to white adolescent males (6.9%). This same phenomenon was observed in adolescent females

(white, 3.8%; African American, 10.6%; Hispanic, 7.2%). However, the prevalence of those who ate vegetables one or more times per day was higher among white (62.8%) and Hispanic (56.1%) when compared to African American students (49.4%). The combination of these findings further exemplify that racial differences exists in terms of dietary practices.

In terms of cross-cultural comparisons of health-related behavior, Li and colleagues (2012) sought to examine the differences in health promotion practices (health responsibility, physical activity, nutrition, interpersonal relationships, spiritual growth, and stress management), stress, and coping styles amongst American (N = 319) and Chinese (N =335) college students. Across both cultures, youth who reported decreased levels of stress also reported more frequent engagement in the described health-promoting behaviors, except for health responsibility. In this case, American youth stress levels were not predictive of their health responsibility, while a difference still existed in Chinese youth. Interestingly, despite the lack of differences in these behaviors, American youth reported greater substance utilization as a coping strategy, while Chinese youth more frequently endorsed activities like denial to cope. The authors indicated this is likely due to the increased amount of substance utilization (7.9%) that is observed in the United States, when compared to various countries of the world like China (e.g., 1.7%). The authors also noted that substance abuse and poor coping strategies for stress may be associated with the transition from home to a more independent setting, such as at a university for post-secondary study. These findings strongly align with literature that references the importance of developing health-promoting behaviors prior to leaving home, to facilitate a sustainable impact (Harris et al., 2005; Musavian et al., 2014; Persch et al., 2015).

Socio-Economic Differences in Terms of Health-Related Behaviors

Socio-economic status (SES) has also been associated with participation in health-related behaviors. The American Psychological Association has noted that SES encompasses factors related to income, educational attainment, fiscal security, and subjective perceptions of social class and status (Saegert et al., 2006). SES has been found to be associated with a family's dietary intake. A nationally representative sample (N> 150,000 at each time point) that included participants ages 11, 13, and 15, throughout 33 European countries (i.e., England, France, Poland) and the United States found that socioeconomic status and income inequality was predictive of amount of time engaging in physical activity, body mass, and life satisfaction over three time points (2002, 2006, 2010; Elgar et al., 2015). The authors attributed these findings to the fact that growing up and living in an impoverished neighborhood (e.g., Low SES) contributes to the development of negative health-related behaviors (e.g., obesity) and mental health concerns (e.g., depression, increased stress).

Similarly, in a sample of youth (10-13 years old; N = 4, 824), Fradkin and colleagues (2010) found that those youth who were identified in the highest SES category had the lowest rates of childhood obesity, when compared to those in lower SES categories, even when controlling for racial group. Singh, Siahpush, and Kogan (2010a; 2010b) indicated that increased socioeconomic status provides parents with the opportunity to tailor their children's diet to be more nutritious (e.g., higher fruits and vegetable intake) with greater exposure to resources (e.g., sports team participation). Also, it is essential to examine the impact of the disparities between neighborhoods of varying SES as those that are identified as more dangerous might limit the abilities of residents to engage in health-promoting activities based on a perceived lack of safety within the neighborhood. Goesling and Firebaugh (2004) have noted

that as inequality rises throughout the world, the examination of the long-term impact of these factors (e.g., increased mental health concerns, increased stress) on mental health, physical health and longevity is a necessity. In terms of school-based research, Free and/or Reduced-Price Lunch status often serves as an indicator of socioeconomic status (Harwell & LeBeau, 2010).

Summary of Demographic Differences Related to SWB and Health-Promoting Behaviors

Meaningful differences have been identified in the literature that pertain to various demographic factors (Centers for Disease Control and Prevention, 2018; Johnston et al., 2018; Kann et al., 2018; Spear & Kulbock, 2001) that are essential to consider within any study design. Literature has indicated that youth of various ethnic groups or genders may report engaging in a combination of health-promoting and health-compromising behavior at various time points within their development. Despite these findings, the lack of clear links limits the generalizability of a "healthy profile," particularly in terms of mental health and subjective well-being. Take for example, females who adhere to healthier dietary practices (Centers for Disease Control and Prevention, 2018) may also engage in behaviors that are comprising in terms of sleep (Galland al., 2017). In comparison, boys may engage in more vigorous forms of exercise, it appears they also may be susceptible to engage in unhealthier dietary practices (e.g., poor nutrition; Neumark-Sztainer et al., 2002) and substance utilization (Centers for Disease Control and Prevention, 2018). Based on the findings of Shaffer-Hudkins (2011), who indicated limited impact of the demographic factors on health-related behaviors and SWB in early adolescents, further examination within a study that incorporates comprehensive assessments of physical and mental wellness in older adolescents was warranted.

Summary of the Literature

This chapter aimed to provide an overarching framework pertaining to the conceptualization of mental (i.e., SWB) and physical wellness (i.e., health-promoting behaviors). Subjective well-being, it's conceptualization as an individual construct and protective factor, that is associated with increased physical health, was reviewed. In terms of physical health, the most commonly examined health-promoting behaviors in prior studies have been physical activity and dietary practices. However, recent literature has identified the importance of examining sleep-related behavior and sleep hygiene practices (Gadermann et al., 2016; Weinberg et al., 2016; Lai, 2018). The literature base has identified that various health-promoting behaviors have been associated with increased forms of positive mental health. However, an examination of the health-promoting behaviors of high school students (and its relationship with SWB) is lacking in the empirical literature. This gap may be attributed to the more frequent examination of health-compromising behaviors that are common studied within this age group. Therefore, based on the high levels of adolescent's engagement in health-compromising behaviors (e.g., Centers for Disease Control and Prevention, 2018) and more limited engagement in health-promoting behaviors (Chen et al., 2007; Rew et al., 2010), conducting this study to gain an exploratory understanding of the relationship between these factors was essential.

In terms of the health-promoting behaviors that were examined in this study, 12 behaviors of interest were identified (e.g., dietary habits, physical activity habits, eight sleep hygiene factors, tobacco product abstinence, alcohol product abstinence), based on prior research findings indicating an association with levels of SWB and the PI's ability to comprehensively measure each behavior (e.g., empirically validated and reliable, multiple subscale measures). Additionally, each of these behaviors (e.g., low fat, high fruits/vegetables diet) also have been

incorporated into the prior studies, but aligned with a more deficit focused approach, as health-compromising behaviors (e.g., high fat, low fruits/vegetables diet). Furthermore, this study considered aspects of demographic factors, given differences that were identified in the literature with respect to health-promotion. Incorporating these factors into study design is essential to facilitate programs and services that are effective and influential for various groups of high school students.

CHAPTER THREE:

METHODS

This study investigated the relationship between 12 health-promoting behaviors and subjective well-being in a sample of high school students. The goal of this research was to expand upon the existing literature base pertaining to the connection between physical and mental wellness. In terms of specific health-promoting behaviors of interest in this study, self-reported measures of healthy dietary practices, physical activity habits, sleep hygiene components, and abstinence from tobacco and alcohol products were collected. Subjective well-being scores (SWB; an operationalized term for happiness), were comprised of scores from measures of life satisfaction, positive affect, and negative affect. The strength and direction of the relationship between each health-promoting behavior and reported levels of SWB was examined. This study also examined the unique portion of the variance for each of the described health-promoting behaviors and participants' perceived levels of subjective well-being. Demographic differences with respect to socioeconomic status, gender, and race, on both SWB and each of the health-promoting behaviors of interest were also considered throughout this research. The current chapter provides an overview of the participants, the methods by that data were collected, and a summary of reliability and validity data pertaining to each of the utilized measures. Finally, an overview of the statistical analyses is provided.

Participants

The Primary Investigator (PI) of this study recruited students from five high schools (i.e., 9th through 12th grade enrolled students; one in rural Western Pennsylvania, one in urban Western Florida, three in rural Central Florida; see Table 3) to participate in this research study. The total sample included was 450 high school students (*M*= 15.70 years old; 14 to 19 years old). An additional six students obtained parental consent and initially began to participate in the study. However, their responses were eliminated for reasons including absence from school on day of data collection, malingering behavior, and general refusal to complete the survey packet after staring. The sample was comprised of 225 students enrolled in 9th grade, 101 students enrolled in 10th grade, 70 students enrolled in 11th grade, and 54 students enrolled in 12th grade. In sum, 140 participants resided in Pennsylvania and 310 participants resided in Florida. These student participants were diverse in terms of race and ethnicity (38.90% Caucasian, 24.70% Hispanic, 22.40% African-American, 3.40% Asian, 7.80% multiracial), and in terms of socio-economic status (45.60% of students were eligible for free or reduced-price lunch; see Table 4). To gain further clarity in the relationship between the variables of interest, pairwise deletions were utilized, providing a sample size of 430 participants for multiple regression models which examined the main effects of the health-promoting behaviors on SWB (see Table 5).

To recruit participants, the PI met with the administrators of the participating high schools across three school districts (two in Florida, one in Pennsylvania). During these meetings, the PI provided a rationale for the study and attempted to acquire each school administrator's respective collaboration to form a research-based partnership and acquire a letter of support for this research study. Upon successfully formulating each partnership, the PI and the cooperating school administrators developed a timeline to allow for students to obtain

consent and for a data collection date(s). Also of importance, a professional development seminar was provided to one of the participating school districts. Prior to data collection (March 2019), the PI and a member of his doctoral committee provided a two-day, professional development seminar for one of the participating district's physical education departments, in that three of the participating high schools were housed. This district initially requested this professional development to improve and enhance their physical education curriculum. The seminar focused on building the capacity of physical educators to deliver social-emotional learning services and methods to embed positive psychology constructs within physical education curriculum.

Once the cooperating schools were identified, it was determined that data collection could take place during health and/or physical education classrooms, based on the relevance of study content. Students served exclusively in self-contained academic special education classrooms were not sought for participation, due to necessary reading achievement levels and reasoning skills necessary for the completion of this survey packet. Students were required to be English speaking based on the nature of the measures that were incorporated into the study design. The PI visited each classroom, described the rationale for the study as well as participant incentives (i.e., healthy snack). The PI then distributed informed consent letters that were sent home with each student requesting active parental consent for students to participate in the study (see Appendix A). Students were informed that if they required a parental consent form in a language other than English they could contact the PI who would make one available to them. No students requested a translated consent form into their parent's native language. Each consent form provided parents/guardians with the opportunity to allow their child to participate in this study. The consent forms of parents who refused to allow their child to participate were not

requested to be returned. Students were instructed to return consent forms to their health/physical education teacher within a two-week time frame. At the beginning of data collection, students were asked to sign an assent form (see Appendix B). Participant response rates for each school and the entire sample are summarized in Table 5. With respect to School B, consent rates were lower than anticipated, largely in part due to scheduling conflicts (e.g., standardized testing) and the classroom format (e.g., students were informed of the study and recruited in groups of 100+ students) that was utilized during participant recruitment.

In terms of compensation, participants received a healthy snack for participating in the study. Additionally, the classroom that had the highest number of participants at each school received a snack party. Another method that was utilized to increase participation focused on physical education teachers. Specifically, cooperating teachers received a $5 gift card (e.g., Publix, Wawa, Sheetz) as gratitude for the collection of consent forms. Receiving this incentive was not based upon the number of students who obtained active consent from their parents.

It is also important to note these schools differed in their school start time. Given the interest of sleep in this study, it is important to identify that some of the variability in the sleep hygiene factors may have been associated with these differences in school start time. Specifically, School A began the school day at 7:30 AM and ended at 2:40 PM. School B, C, and D, began the school day at 7:00 AM and ended at 2:00 PM. School E began the school day at 8:30 AM and ended at 3:25 PM.

Table 2.

Descriptive Characteristics of Student Population at Participating Schools

	School A (*N* = 861)	School B (*N* = 2,332)	School C (*N* = 2226)	School D (*N* = 2371)	School E (*N* =1788)
Location	Western PA	Central FL	Central FL	Central FL	Western FL
Setting	Rural	Rural	Rural	Rural	Urban
Gender					
Male	49.7%	49.7%	50.9%	50.5%	51.4%
Female	50.3%	50.3%	49.1%	49.5%	48.6%
Grade					
9th	27.5%	27.5%	31.7%	29.4%	26.0%
10th	24.9%	27.7%	27.9%	27.2%	26.6%
11th	24.3%	24.7%	21.7%	22.9%	23.5%
12th	23.2%	20.0%	18.8%	20.5%	23.8%
Race					
White	88.1%	55.7%	49.2%	15.5%	18.0%
African American	3.6%	16.0%	18.4%	25.6%	44.0%
Hispanic	1.6%	21.4%	25.4%	53.3%	16.7%
Multiracial	<1.0%	3.6%	2.3%	1.6%	4.3%
Asian	5.9%	2.9%	3.6%	3.0%	15.9%
Pacific Islander	<1.0%	<1.0%	<1.0%	<1.0%	<1.0%
AIAN	<1.0%	<1.0%	<1.0%	<1.0%	<1.0%
Other	<1.0%	<1.0%	<1.0%	<1.0%	<1.0%
Socioeconomic Status					
Non-FRL	77.0%	61.9%	63.0%	52%	40.3%
FRL	33.0%	38.1%	37.0%	48%	59.7%

**Note*. AIAN= American Indian/Alaska Native. FL = Florida. FRL= Free or reduced-price lunch status. PA = Pennsylvania.

Table 3.

Descriptive Characteristics of Participants (*N* = 450)

	School A (*N* = 861)	School B (*N* = 2,332)	School C (*N* = 2226)	School D (*N* = 2371)	School E (*N* =1788)	Total Sample (*N* = 450)
Location	Western PA	Central FL	Central FL	Central FL	Western FL	
Setting	Rural	Rural	Rural	Rural	Urban	
Gender						
Male	50 (35.7%)	14 (48.3%)	27 (42.9%)	80 (48.5%)	25 (47.2%)	196 (43.6%)
Female	90 (64.3%)	15 (51.7%)	36 (57.1%)	85 (51.5%)	28 (52.8%)	254 (56.4%)
Grade						
9th	52 (37.1%)	22 (75.9%)	55 (87.3%)	63 (38.2%)	33 (62.3%)	225 (50.0%)
10th	28 (20.0%)	4 (13.8%)	4 (6.3%)	59 (35.8%)	6 (11.3%)	101 (22.4%)
11th	19 (13.6%)	3 (10.3%)	4 (6.3%)	39 (23.6%)	5 (9.4%)	70 (15.6%)
12th	41 (29.3%)	0 (0.0%)	0 (0.0%)	4 (2.4%)	9 (17.0%)	54 (12.0%)
Race						
White	119 (85.0%)	14 (48.2%)	24 (38.1%)	17 (10.3%)	1 (1.9%)	175 (38.9%)
African American	5 (3.6%)	5 (17.2%)	12 (19.0%)	49 (29.7%)	30 (56.6%)	101 (22.4%)
Hispanic	5 (3.6%)	1 (3.4%)	16 (25.4%)	77 (46.7%)	12 (22.6%)	111 (24.7%)
Multiracial	1 (.7%)	5 (17.2%)	8 (12.7%)	16 (9.7%)	5 (9.4%)	35 (7.8%)
Asian	7 (5.0%)	2 (6.9%)	0 (0.0%)	1 (0.6%)	1 (1.9%)	11 (2.4%)
Pacific Islander	0 (0%)	0 (0.0%)	0 (0.0%)	1 (0.6%)	1 (1.9%)	2 (0.4%)
AIAN	2 (1.4%)	2 (6.9%)	1 (1.6%)	2 (1.2%)	0 (0.0%)	7 (1.6%)
Other	1 (0.7%)	0 (0.0%)	2 (3.2%)	2 (1.2%)	3 (5.7%)	8 (1.8%)
Socioeconomic Status						
Non-FRL	92 (65.7%)	24 (82.8%)	39 (61.9%)	84 (50.9%)	6 (11.3%)	245 (54.4%)
FRL	48 (34.3%)	5 (17.2%)	24 (38.1%)	81 (49.1%)	47 (88.7%)	205 (45.6%)

**Note*. AIAN= American Indian/Alaska Native. FL = Florida. FRL= Free or reduced-price lunch status. PA = Pennsylvania.

Table 4.

Descriptive Characteristics of Participants with All Data included in Regression Models (*N*= 430)

	School A (*N* = 861)	School B (*N* = 2,332)	School C (*N* = 2226)	School D (*N* = 2371)	School E (*N* =1788)	Total Sample (*N* = 430)
Location	Western PA	Central FL	Central FL	Central FL	Western FL	
Setting	Rural	Rural	Rural	Rural	Urban	
Gender						
Male	49 (35.7%)	14 (48.3%)	24 (41.4%)	76 (49.0%)	25 (49.0%)	188 (43.7%)
Female	88 (64.3%)	15 (51.7%)	34 (58.6%)	79 (51.0%)	26 (51.0%)	242 (56.3%)
Grade						
9th	50 (36.5%)	22 (75.9%)	50 (8.6%)	58 (37.4%)	31 (60.8%)	211 (49.1%)
10th	28 (20.4%)	4 (13.8%)	4 (6.9%)	57 (36.8%)	6 (11.8%)	99 (23.0%)
11th	19 (13.9%)	3 (10.3%)	4 (6.9%)	36 (23.2%)	5 (9.8%)	67 (15.6%)
12th	40 (29.2%)	0 (0.0%)	0 (0.0%)	4 (2.6%)	9 (17.6%)	53 (12.3%)
Race						
White	117 (85.4%)	14 (48.3%)	22 (37.9%)	17 (11.0%)	1 (2.0%)	171 (39.8%)
African American	4 (2.9%)	5 (17.2%)	11 (19.0%)	45 (29.0%)	28 (54.9%)	93 (21.6%)
Hispanic	5 (3.6%)	1 (3.4%)	15 (25.9%)	73 (47.1%)	12 (23.5%)	106 (24.7%)
Multiracial	1 (0.7%)	5 (17.2%)	7 (12.1%)	14 (9.0%)	5 (9.8%)	32 (7.4%)
Asian	7 (5.1%)	2 (6.9%)	0 (0.0%)	1 (0.6)	1 (2.0%)	11 (2.6%)
Pacific Islander	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.6%)	1 (2.0%)	2 (0.5%)
AIAN	2 (1.5%)	2 (6.9%)	1 (1.7%)	2 (1.3%)	0 (0%)	7 (1.6%)
Other	1 (0.7%)	0 (0.0%)	2 (3.4%)	2 (1.3%)	3 (5.9%)	8 (1.9%)
Socioeconomic Status						
Non-FRL	90 (65.7%)	24 (82.8%)	36 (62.1.%)	78 (50.3%)	6 (11.8%)	234 (54.4%)
FRL	47 (34.3%)	5 (17.2%)	22 (37.9%)	77 (49.7%)	45 (88.2%)	196 (45.6%)

**Note*. AIAN= American Indian/Alaska Native. FL = Florida. FRL= Free or reduced-price lunch status. PA = Pennsylvania.

Table 5.

Response Rate of Participants at Each School in Sample

Location (School)	Teachers	Classes	Students Per Class	Participants Recruited	Participants Consented	Response Rate
Western PA (A)	3	15	18-35	351	142	40.46%
Central FL (B)	3	12	32-40	460	30	6.52%
Central FL (C)	3	12	19-31	301	64	21.26%
Central FL (D)	4	17	32-35	545	167	30.64%
Western FL (E)	1	4	34-40	144	53	36.80%
Total	14	49		1,801	456*	25.32%

Note. FL=Florida. PA=Pennsylvania. *Final sample included 450 students.

Measures

Demographic Form. The demographic form (see Appendix C) included four questions pertaining to students' gender, age, race/ethnicity and grade level. Each of the items on the demographic form include multiple choice response options. Participants completed this form after assenting to participate in the study. Throughout this study, participants who endorsed multiple races (e.g., selected both white and Hispanic) were included in all analyses as multiracial.

Students' Life Satisfaction Scale (SLSS; Huebner, 1991a, 1991b). The SLSS is a 7-item self-report measure of global life satisfaction (see Appendix D). This measure utilizes a 6-point scale (1 = *strongly disagree* to 6 = *strongly agree*), on that participants rated statements regarding their life at the current time (e.g., "I have a good life," "I have what I want in life"). The combination of these scores yields an average score life satisfaction score that was utilized in this study. Two items that are included in this measure were reverse scored. Higher global life satisfaction was indicated by a higher mean score. Research has indicated this measure yielded a small, non-significant correlation when compared to a measure of social desirability (r = .05; Huebner, 1991a), minimizing the concern regarding the self-report nature of this measure.

The PI chose this measure as the indicator of students' life satisfaction based on wide spread utilization in the positive psychology literature (i.e., considered the gold standard measure of global life satisfaction and has been consistently utilized in studies of youth SWB; Shaffer-Hudkins, 2011; Suldo & Shaffer, 2008; Suldo et al., 2016). Additionally, this measure has yielded sufficient support in terms of reliability and validity in samples of high school students. Specifically, the internal consistency (α= .82; Huebner, 1991a; 1991b; α= .85; Valois et al., 2004; α= .93; Suldo et al., 2009) and the test-retest reliability at two weeks (*r* = .76; Terry & Huebner, 1995) and at one year (*r* = .53 Huebner et al., 2000) has provided support for reliability of the measure. With respect to validity, prior research also has noted this measure has strong, positive correlations with other measures of SWB in students of varying socioeconomic status and self-reported differences in levels of life satisfaction (Bender, 1997; Proctor, Linley, & Maltby, 2009). Also, Huebner and colleagues (2000) found validity support for the measure in a sample of 321 high school students. Specifically, the SLSS was found to have modest, significant positive correlations with the adaptive scales on the Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992): self-esteem (*r* = .40), relations with parents (*r* = .48) and interpersonal relations (*r* =.25). There also were significant, negative correlations with the clinical subscales on the same measure: locus of control (*r* =-.50), depression (*r* =-.56), anxiety (*r* =-.33), social stress (*r* =-.45), sense of inadequacy (*r* =-.40), attitude towards school (*r* =-.24), and attitude towards teacher (*r* =-.26). This measure is summarized in Table 6.

Positive and Negative Affect Schedule for Children (PANAS-C; Laurent et al., 1999). The PANAS-C is a 27-item measure that is utilized to assess the positive and negative affect (e.g., experienced emotions) of children (see Appendix E). Participants were asked to respond to statements set to a 5-point scale (1 = *very slightly or not at all* to 5 = *extremely*) regarding their

current feelings of positive emotions (i.e., proud, joyful, happy, lively, cheerful) and negative emotions (i.e., scared, afraid, mad, miserable, sad). The total scores for both affect subscales were comprised of the averages of the provided positive and negative emotions and utilized in the subsequent analyses. This measure has been utilized in studies with children and adolescent participants to assess the rate of positive and negative emotions. This 27-item measure for children was mirrored after the PANAS (20 items; Watson, Clark, & Tellegan, 1998), that was developed to examine the occurrences of positive and negative emotions in adults. This measure includes 12 items that examine positive affect and 15 items that examine negative affect.

The original sample that was utilized in the development of this measure included 707 youth and adolescents (Laurent et al., 1999). The researchers noted the Positive Affect (PA; α = .89) and Negative Affect (NA; α=.92) subscales yield high internal consistency. Suldo and colleagues (2016) identified that the positive (α=.90) and negative affect (α=.91) scales had strong internal consistency in a sample of 500 high school students. Laurent and colleagues (1999) also noted in terms of construct validity, the PANAS-C was acceptable when compared to the negative association with Children's Depression Inventory (r = -.42; Kovacs, 1992). When utilizing factor analysis, the initial sample yielded strong support in terms of construct validity for both positive and negative affect scales, as emotions (i.e., items) loaded on respective factors. The positive and negative affect scales have been included in prior studies that sought to analyze participants' levels of SWB (Antaramian, 2015; Antaramian et al., 2011; Shaffer-Hudkins, 2011; Suldo & Shaffer, 2008; Suldo et al., 2011; Suldo et al., 2016). This measure is summarized in Table 6.

Adolescent Food Habits Checklist (AFHC; Austin et al., 2009; See Appendix F). The AFHC is a 22-item, self-report measure, that required participants to assess their general dietary

habits (e.g., “If I am having lunch away from home, I often choose a low-fat option.”). Participants indicated if the provided statements are either true, false, or not applicable to their dietary habits. Participants receive a point for each healthy response and the total scale score is determined as a dietary behaviors score, that was utilized in the analyses for this study. This measure was chosen as the primary indicator for health-dietary practices because it examines the habits of adolescents and their general efforts to promote healthy-eating, whereas other measures have examined self-regulation or preferences for certain foods.

Johnson and colleagues (2002) designed the measure utilizing the true/false response format, as self-report of dietary practices is often difficult to estimate. Previous research methods that have been identified in the literature include dietary logs, food records, and food recall measures. In terms of validity, the measure was first developed in a sample of English adolescents (N = 1, 822, M = 14.42 years old; range 13 to 16 years old) and found to have sufficient internal consistency (α=.83; Johnson et al., 2002) for the original 23 items. Regarding test-retest reliability, Johnson and colleagues (2002) identified that this measure had strong test-rest reliability (r = .90, p<.001) in a sample of 24 adolescents (M = 13.66 years old) across two weeks. This study also sought to examine convergent validity between the AFHC and various dietary indicators. The results of these analyses indicated scores on the AFHC were associated with increased fruit and vegetable consumption (r = .45) and negatively associated with fat intake (r = .46) as measured on the Dietary Instrument for Nutrition Education (DINE; Roe et al, 1994).

In terms of the utilization of this measure in an American sample, Austin and colleagues (2009) evaluated this measure as part of a larger study, that included a sample of 41 American adolescents (11-17 years old) across two time points. The internal consistency of the AFHC was

adequate at Time 1 (N= 34; α=.52) and Time 2 (N = 35; α=.79). The results of this study also indicated that there was a significant negative correlation between the AFHC change score between both time points and the Perceived Stress Scale score between both time points (*r* = -.46; Cohen & Williamson, 1988). Austin and colleagues (2009) modified the original measure (Johnson et al., 2002) to reflect dietary practices that were more pertinent to American youth (e.g., "crisps" were identified as "chips"). This modified version was utilized in this study, as permission was granted by Austin, the primary investigator who developed this altered measure (2018, July 9; see Appendix G).

Another important concept of the original measure developed by Johnson and colleagues (2002) was that this version allowed for participants to respond as "non-applicable" if the question was not relevant to their dietary practices. An example of the response format on the original measure is: "If I am having a dessert at home, I try to have something low in fat?: true, false, or not applicable." However, Austin and colleagues (2009) altered this measure as to not allow for participants to respond as non-applicable. For nine of the questions, if participants selected "false' as their response, they were then prompted to answer a secondary question to further distinguish their dietary practices and to reduce the need for non-applicable responses. For example, participants could response to the question "I don't eat desserts," as either True or False (Austin et al., 2009). If a participant identified this response was false, an arrow then directed them to a second question: "If I am having a dessert at home, I try to have something low in fat?: true or false?"(Austin et al., 2009). Participants then receive a point if they select the healthy option to be calculated into the sum percentage score. Participants could receive a maximum of 23 total points on this measure, as question 11 was worth up to two points, given that participants must answer questions 11A through 11C, while the other 21 questions are worth

between zero and one point. This is consistent with the revisions described by Austin and colleagues (2009). This measure is summarized in Table 6.

Physical Activity Questionnaire for Adolescents (PAQ-A; Kowalski et al., 1997; Kowalski et al., 2004; See Appendix H). The PAQ-A is a self-administered, 9-item instrument that required participants to assess their general levels of physical activity during the past 7 days (e.g., In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in that you were very active?). This measure does not provide an estimate of caloric expenditure but was designed to be administered to students in 9th through 12th grade (i.e., ages 14-20 years old). The authors noted that this measure takes no more than 15 minutes to complete and should be utilized during the school year, not during the summer or holiday breaks, based on the timeframes noted in the questions. Specifically, this measure is set to a five-point scale (1= *None,* 5 = *6 or more times*) with greater scores indicating higher levels of physical activity. This measure yields a total physical activity score, that is comprised of the averages of the response on the first 8 items, that was utilized in the analysis for this study. The first question requires participants to identify their participation in various activities and the average across responses is utilized in terms of scoring for this question. The ninth question is specific to illness during the prior week that prevented routine participation in physical activities that is not included in the summative analyses. This measure was mirrored after the Physical Activity Questionnaire for Children (Kowalski et al., 2004).

Reliability and validity of the PAQ-A has been assessed across various cultures. Tate and colleagues (2015) identified that in a sample of 145 mid-western, American adolescents, the internal consistency was strong (α=.89) and the test-retest reliability was adequate (r=.74). In terms of validity, the PAQ-A has been found to be positively correlated with the Leisure Time

exercise scale (r = .57), as well as a Caltrac motion sensor (r = .33; Martin et a., 2011). In a sample of 85 Canadian high school students, Kowalski and colleagues (1997) found the PAQ-A was positively correlated with an activity rating scale (r= .73), the Leisure Time Exercise Questionnaire (r=.57), and the 7-day Physical Activity Recall Interview (PAR; r=.59). Bervoets and colleagues (2014) found a similar level of internal consistency (α=.76) in a sample of 94 Dutch adolescents. Finally, Martínez-Gómez and colleagues (2009) found the Spanish version of the PAQ-A yielded adequate test-retest reliability (one week apart; ICC= .71) in a sample of 232 Spanish adolescents ages 13 through 17. Also, Martínez-Gómez identified that the internal consistency of this measure was adequate at the first (α = .65) and second (α = .74) self-report data collection time points. This measure is summarized in Table 6.

To gain a greater understanding of the theoretical structure of this measure, a confirmatory factor analysis was completed. Results of the confirmatory factor analysis indicated that the fit of the model for the ASHS subscales was not satisfactory (CFI =.78, SRMR =.12, RMSEA=.08). The χ^2 (209, N= 449) = 832.12, p <.001 test of the model fit indicated a statistically significant lack of fit. The factor loadings for the AFHC ranged from .16 and .72 with an average loading of .53 for the 22 items. Given these indices, the results of this study should be interpreted with caution.

Adolescent Sleep Hygiene Scale (ASHS; LeBourgeois et al., 2005; See Appendix I). The ASHS is a 33-item self-report measure that examines sleep inhibiting and facilitating behaviors in adolescents (ages 12 to 18 years old). Eight specific factors of sleep hygiene are addressed through 27 items: physiological (5 items; i.e., “I got to bed with a stomach ache), behavioral arousal (3 items; i.e., “I go to bed and do things in my bed that keep me awake [watching tv, reading]”), cognitive/emotional (6 items; i.e., “I go to bed and think about things I

need to do), sleep environment (5 items; i.e., "I fall asleep while listening to loud music"), daytime sleep (2 item; i.e., "During the day I take a nap that lasts > 1 hour"), substances (2 items; i.e. "After 6:00 P.M., I smoke or chew tobacco"), bedtime routine (1 item; "I use a bedtime routine (for example, bathing, brushing teeth, reading), and sleep stability (3 items; "On the weekends, I stay up >1 hour past my usual bedtime). The alignment of specific questions with each of the sleep hygiene subscales is provided in Appendix I. This measure is set to a six-point scale (1 = *never, 0% of the time;* 6= *always, 100% of the time*) with greater scores indicating greater levels of sleep hygiene. Item 27 is reverse scored. This measure yields a total score (mean of combined subscale scores) and individual subscale scores, either that can be used for interpretation of specific sleep hygiene components. An additional 6 items of this measure are not included as part of the subscale or ASHS total score, but are included in this measure based on the theoretical basis of sleep hygiene. Additionally, this measure requires four qualitative responses (i.e., embedded within questions 30-33) that are utilized to determine standard bed time routines and wake times on weekdays and the weekends.

The Adolescent Sleep Hygiene Scale (LeBourgeois et al., 2005) was modified from the Children's Sleep Hygiene Scale (Harsh et al., 2002) to provide a measure that could assess the sleep hygiene habits in adolescent populations. A study by LeBorugeois and colleagues (2005), that sought to examine the sleeping habits of middle and high school students in Italy (N = 776) and the United States (N = 572), identified this measure yielded strong consistency for the total score for the ASHS (α=.80). In terms of validity, Storfer-Isser and colleagues (2013) sought to examine the psychometric properties of the ASHS in a sample of 514 American adolescents (M = 17.7 years old; 16-19 years old). Scores for total sleep hygiene were positively correlated with sleep duration (r= .16) and sleep efficiency (r= .12), both that were assessed using actigraphy

monitoring sleep watches (Octagonal Sleep Watch 2.01; Ambulatory Monitoring INC, Ardsley, NY, USA). Additionally, scores for overall sleep hygiene were negatively correlated with self-reported Epworth Sleepiness Scale daytime sleepiness (Johns, 1992; r= -.26). Also, internal consistency was noted to be strong for various subscales: physiological (α=.60), behavioral arousal (α=.62), cognitive/emotional (α=.81), sleep environment (α=.61), sleep stability (α=.68), and day time sleep (α=.78; Storfer-Isser et al., 2013). These factors were found to be significantly correlated with the Epworth sleepiness scale: physiological (r = -.10), behavioral arousal (r = -.09), cognitive/emotional (r = -.23), sleep environment (r=-.21), sleep stability (r= -.11), and day time sleep (r= -.31).

This measure was chosen by the PI to be utilized in this study for several reasons. Specifically, the measure's focus on sleep hygiene, as opposed to quality of sleep, and the various components of sleep hygiene that are assessed in this measure allows for a comprehensive assessment of the various behaviors that contribute to quality sleep. Also, its availability at no cost for public utilization is a benefit of this measure. Additionally, a review conducted by Spruyt and Gozal (2011) indicated there are limited measures that assess sleep hygiene (e.g., limiting screen time before bed), whereas more measures evaluate the prevalence of sleep quality related issues (e.g., restlessness, inability to fall asleep) or require parent perceptions for data collection. This measure is summarized in Table 6.

To gain a greater understanding of the theoretical structure of this measure, confirmatory factor analysis were completed. Results of the confirmatory factor analysis indicated that the fit of the model for the ASHS subscales was not satisfactory (CFI =.827, SRMR =.065, RMSEA=.063). The χ^2 (297, N= 440) = 819.33, p <.001 test of the model fit indicated a statistically significant lack of fit. Standardized factor loadings for the 27 items were

significantly different from zero ($p < .05$). For the sleep hygiene physiological factor, loadings ranged from .23 and .61 with an average loading of .45 for the five items. The sleep hygiene behavioral arousal factor loadings ranged from .50 and .62 with an average loading of .57 for the three items. The sleep hygiene cognitive emotional factor loadings ranged from .43 and .76 with an average loading of .60 for the six items, and the sleep environment factor loadings ranged from .44 and .62 with an average loading of .53 for the five items. The sleep stability factor loadings ranged from .51 and .80 with an average loading of .67 for the three items. The sleep hygiene daytime sleepiness factor loadings ranged from .79 and .95 with an average loading of .88 for the two items and the sleep hygiene substances factor loadings ranged from .69 and .84 with an average loading of .77 for the two items. Given these indices, the results of this study should be interpreted with caution.

Adolescent Alcohol and Tobacco Utilization Scale (AATUS; Center for Disease Control and Prevention, 2018; Centers of Disease Control and Prevention, 2009; see Table 6). The AATUS (Appendix J) is a modified, abbreviated version of the Youth Risk Behavior Surveillance System (Centers for Disease Control and Prevention, 2018), a frequently used tool to examine high school aged adolescent's engagement in health-comprising behaviors in a host of national, longitudinal school-based studies. The full instrument examines tobacco use, alcohol and other substance use, risky sexual behaviors, unhealthy dietary practices, physical inactivity, and risk behaviors that contribute to unintentional injury and violence. The measure that was utilized in this study was augmented to solely focus on adolescents' utilization of alcohol and tobacco products, aligned with prior research (Centers for Disease Control and Prevention, 2009). This measure is six items in length. In this study, each of the items were reverse scored, with greater scores indicating higher rates of abstinence from substance

utilization, given the focus on health-promotion. Specifically, four items focusing on various forms of tobacco products (e.g., cigarettes, chewing tobacco, electronic vapor products) and two items examining alcohol utilization (e.g., how many days did you have at least one drink of alcohol, on how many days did you have at least 4/5 or more drinks of alcohol in a row within a couple hours if you are a girl/boy) formulate two separate scales. Examining alcohol as one factor, as opposed to separate factors (e.g., malt liquor vs distilled products) is consistent with multiple national, longitudinal studies (Center for Disease Control and Prevention, 2018; Johnston et al., 2018).

This measure utilizes a 7-point scale (e.g., 1 = *zero days*, 7 = *all 30 days*) consistent with those of the YRBSS studies to assess the frequency of participants' utilization of these substances within the past 30 days. Prior administrations of former versions of the YRBSS have identified that alcohol (alcohol = 63.4%) and tobacco (kappa = 68.8%) related questions have been consistently reliable (Brener 2002; Brener et al., 2013). Currently, no published studies exist that have examined the reliability and validity of adolescent's engagement in the behaviors examined in the most current YRBSS (Brener et al., 2013). However, these researchers indicated that the cognitive and situational factors that could impact the validity of adolescents self-reporting behaviors have been identified as non-threatening.

Procedure

Upon approval of the study by the PI's doctoral committee, the primary investigator submitted the required application to the University of South Florida (USF) Institutional Review Board (IRB; see Appendix K). The PI submitted the required documents for IRB approval to all three districts that participated in this study. IRB approval from the University of South Florida was obtained during January 2019 and approval was obtained from each of the respective school

Table 6.

Summary of Measures for Variables of Interest

Subjective Well-Being		
Construct	Measure	Scale(s) Analyzed
Life Satisfaction	Students' Life Satisfaction Scale (SLSS; Huebner, 1991)	Life Satisfaction Sum Scale
Positive and Negative Affect	Positive and Negative Affect Schedule for Children (PANAS-C; Laurent et al., 1999)	Positive Affect Scale Negative Affect Scale
Health-Promoting Behaviors of Interest		
Construct	Measure	Scale(s) Analyzed
Dietary Habits	The Adolescent Food Habits Checklist (AFHC; Johnson et al., 2002)	Total Health Dietary Habits Score
Exercise Habits	The Physical Activity Questionnaire for Adolescents (PAQ-A; Kowalski et al., 1997; Kowalski et al., 2004)	Total Physical Activity Scale Score
Sleep Hygiene	Adolescent Sleep Hygiene Scale (ASHS; LeBourgeois et al., 2005)	8 Sleep Hygiene Factor Subscales
Tobacco Abstinence	Adolescent Alcohol and Tobacco Utilization Scale (Center for Disease Control and Prevention, 2018)	Tobacco Abstinence Scale
Alcohol Abstinence	Adolescent Alcohol and Tobacco Utilization Scale (Center for Disease Control and Prevention, 2018)	Alcohol Abstinence Scale

Note. All measures are self-report.

districts in March and April of 2019. A pilot test of this survey packet was then conducted to ensure the readability and required time to complete the survey packet was in accordance with allotted time provided by school administrators. This sample was primarily through a convenience sample of 20 adolescents who were enrolled in one of the cooperating schools. Written parental consent was obtained prior to participants completing the pilot testing. Descriptive statistics, internal consistency (α range = .70-88) scores were analyzed to ensure

these measures were appropriate for data collection. No additional pilot testing was deemed necessary. To further validate the utilization of this survey packet and prior to the formalized data collection, cognitive interviews were conducted with five students to ensure participant understanding of research materials upon completion of the pilot testing, aligned with procedures from Willis (1999; e.g., "Can you repeat the question in your own words?"; "How did you get the answer of "x"?; "How do you remember this?").

After the completion of pilot testing, parental consent form to participate in this study was distributed to all students who were currently enrolled in health and/or physical education classes within each of the five schools. Those students for whom parental active consent was obtained were assigned a code number for confidentiality of responses, prior to the data collection. All student participants were asked to report to a centralized classroom or large group instruction room at their respective school during their instructional period on the day of data collection. Students were instructed to sit at least one seat apart from their nearest peer to ensure confidentiality of responses. To start, the PI or IRB approved personnel read aloud the student assent form to all students prior to completion of the survey packet, and students were requested to complete the form. Participants were informed they could withdraw from the study at any time during data collection and were then provided with an opportunity to ask questions. In terms of the order of completion, participants were initially asked to complete the demographic questionnaire. The PI or other members of the research team were present throughout the duration of data collection to assist students with questions (i.e., providing further clarification as needed for specific questions). Participants were provided with the entire instructional period (e.g., approximately 45 to 50 minutes) to complete the survey packets, yet generally took no more than 25 minutes to complete the entire packet. After each participant indicated they had

completed their survey packet, the PI or other IRB approved key personnel scanned the packet to ensure that items were not omitted by participants. Participants were provided with another opportunity to respond when omissions were found. Survey packets were organized in one of two formats to control for order effects. The format of Packet A was demographics survey, SLSS, PANAS-C, PAQ-A, AFHC, ASHS, AATUS. The format of Packet B was demographics survey, SLSS, ASHS, AATUS, AFHC, PANAS-C, PAQ-A.

In terms of the collection of socio-economic status data, the PI provided a confidential list of participant's names to school personnel (i.e., the data clerk; determined with school personnel) who provided records for students in terms of their free or reduced-price lunch status. Free or reduced-price lunch eligibility is dependent upon fourteen eligibility criteria (e.g., family of 4 with a maximum income per year of $47, 638; net rental income, alimony or child support payments, public assistance or welfare payments; Federal Register, 2019). Children only need to meet one criteria to qualify. School districts annually send home school meal applications at the start of each school year. However, applications can be filed by parents at any point throughout the school year. The assisting school personnel within each district were only provided access to the list of those participating students in their respective district and did not have access to participant responses on the completed surveys. The assisting school personnel were compensated (e.g., $5 Publix, Sheetz gift card) for their assistance with this research study.

Ethical Considerations

There were several precautionary measures taken to protect the rights of student participants. Specifically, the PI acquired approval from the University of South Florida and each participating school districts' IRB prior to conducting this research. This review required the documentation of all possible precautions that were implemented to protect human research

participants, prior to conducting any components of data collection. Another ethical consideration pertains to the measures that were utilized in this study, each of that have a strong empirical rationale providing evidence as to their reliability, validity, and ethical utilization in older adolescent participant samples. Also, parental consent forms were sent home with each student enrolled in physical education classes, providing an overview of the research project, and how the specific procedures would be completed. No additional parental contact (e.g., phone calls, email) was required. Although, the PI did provide professional contact information to address any parental inquires.

Additionally, this research utilized an assent form for all student participants who acquired parental consent. Specifically, prior to the administration of the surveys during data collection, the PI or cooperating key personnel reviewed the assent form with the participants prior to obtain their assent. This assent form provided an overarching framework and rationale for the proposed study, and an overview of any risks and benefits to the student. Students were informed that they could decline participation or refuse further participation at any time during data collection. Two of students withdrew from participation during data collection, primarily due to the length of the survey. In terms of the formation of a data set, all data were deidentified and confidential access was granted only to key research personnel for further data analysis. Participant confidentiality was further assured by only analyzing aggregate data so individual participants were unable to be identified.

Overview of Data Analysis

A power analysis was completed to determine the required sample size of participants needed to obtain adequate power for the proposed study. G*Power3.1 was utilized to calculate a range of sample sizes based on the desired effect size. Specific criteria utilized in these analyses

included an alpha level of .05 and a statistical power of .80. The 12 health-promoting behavior predictors and the additional four demographic predictors (i.e., school, race, gender, SES) in the proposed main effects multiple regression analysis also were included in the power analysis. The results indicated assuming a small effect size of .02 would require 977 participants, a moderate medium effect size of .15 would require 143 participants, and a large effect size of .35 would require 70 participants. The sample size of this study allowed for the PI to use a medium effect size (.15) and have ample representation among the various demographic factors. With respect to each participant's identified race, multiple dummy coded variables were incorporated into the study design.

To answer the research questions of interest, a series of statistical analyses were conducted. Data for this study were entered by hand in a Microsoft excel worksheet, transferred into SPSS, checked for errors in the data entry, and screened for any malingering behavior in the participants (e.g., marking the same response for the entire measure).

Preliminary analyses. Aggregate data from each measure were analyzed using various descriptive statistics (i.e., mean, standard deviation, skew, kurtosis) to account for potential outliers. Scores from each completed measure were calculated for all participants in the data set. To determine the reliability of the measures utilized in this study, a series of preliminary analyses were completed.

The SWB variable was created by first standardizing the scores from both the SLSS and the 10-item PANAS-C. To create the SWB variable, z-scores for life satisfaction and positive affect were added together, and negative affect was subtracted from the life satisfaction and positive affect sum score (identical to procedures utilized in Antaramian et al., 2011; Antaramian, 2015; Suldo & Shaffer, 2008; Suldo et al., 2016). In terms of the calculation of

various health-promoting behaviors, specific scores were calculated in accordance with procedures as described above in each measure specific summary. To answer the first research question of interest, that examined the relationship between subjective well-being (SWB) and health-promoting behaviors, Pearson product-moment correlation coefficients were calculated between all variables to assess strength and direction of associations. An alpha level of .05 was used to determine statistical significance, unless otherwise noted. The same procedures were utilized to answer the second research question of interest, that examined the relationship between each of the various health-promoting behaviors.

Upon the completion of the primary analyses, assumptions underlying multiple regression model techniques were completed. Specifically, linearity, normality, homogeneity of error variance, and independence of errors were checked through visual analysis. Appropriate follow-up statistical testing was conducted when deemed necessary. Linearity of the relationship between the independent (i.e., health-promoting behaviors) and dependent variables (i.e., SWB) was examined using scatter plots. Normality was inspected using visual analysis of residuals related to the dependent variables. To assess normality of variables, skewness and kurtosis also was calculated. To examine the homogeneity of error variance, a visual examination of a plot of standardized residuals by standardized predicted values was utilized. To test independence of error, scatter plots of the residuals versus predicted values of the independent variables were utilized to test for independence of error.

To answer the third research question of interest, each of the 12 health-promoting behaviors (i.e., physical activity, diet, sleep hygiene factors, tobacco and alcohol abstinence) were entered into a multiple regression. An alpha level of .05 was used to determine statistical significance. The linear combination of health-promoting behaviors influence on SWB was

assessed by examining the specific percentage of the variance on SWB. The beta weights and shared variance were interpreted to distinguish differences between specific health-promoting behaviors.

To answer research questions four, a series of multiple regression models were conducted to assess for demographic differences (i.e., moderating effects) in the relationship between the health-promoting behaviors of interest and SWB. Beta weights for the main and moderating effects in the model were assessed. The main effects of the model containing each specific demographic variable were assessed by examining the specific percentage of the variance on each health-promoting behavior. Multicollinearity between each of these variables also was investigated in the analyses. In these analyses, an alpha level of .01 was utilized to determine statistical significance, given the number of predictors and interactions that were included in the model.

To answer research questions five, a series of multiple regression models to examine the relationship between specific demographic variables and each of the health-promoting behaviors of interest. Beta weights for the main effects of the model were assessed. The main effects of the model containing the five health-promoting behaviors and each specific demographic variable were assessed by examining the specific percentage of the variance on each of the health-promoting behaviors.

CHAPTER FOUR:

RESULTS

This chapter presents the results of the analyses used to investigate this study's research questions. To answer the first two research questions, correlational data were utilized to assess the strength and direction in the relationship between each of the health-promoting behaviors and participants' levels of subjective well-being (SWB), as well as the relationship between each of the health-promoting behaviors. A series of multiple regression analyses were used to answer research questions three through five, that focused on the relationship between of each health-promoting behavior and participants' levels of SWB, as well as the relationship between various demographic factors and SWB and each of the health-promoting behaviors.

Research Questions

The specific research questions included:

1. What is the relationship between specific health-promoting behaviors employed by adolescents (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence) and their subjective well-being?

2. What is the relationship between each of the health-promoting behaviors of interest in this study (e.g., Is there a significant correlation between physical activity and tobacco abstinence)?

3. After statistically controlling for race, gender, socioeconomic status, and school, that of the above health-promoting behaviors are most strongly related to the subjective well-being of adolescents?

4. To what extent, if any, are the relationships between adolescents' health-promoting behaviors and subjective well-being moderated by various demographic factors (gender, race, socioeconomic status)?

5. What are the relationships between gender, ethnicity, and socioeconomic status and each of the health-promoting behaviors (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence)?

Preliminary Analyses

Data entry. Data collected from completed survey packets were entered into a password-protected excel spreadsheet by the PI or another IRB approved personnel member. Integrity checks were completed for 20% of the entered data (i.e., 90 survey packets checked for accuracy). Specifically, every fifth participant's electronic data were checked alongside the original paper survey data to ensure validity of the data entry. In cases when data entry errors were apparent, one additional participant entry before and after the error was checked to ensure accuracy. Data error entries were minimal as only 3.3% of packets checked contained data entry errors. The correct data were then transferred into the Statistical Package for the Social Sciences (SPSS; version 24) that was utilized to sum or average the variables of interest to create scales and to conduct the necessary analyses to answer the research questions.

Missing data. Rates of missing data were low because of the specific data collection procedures implemented to ensure acquisition of as much data as possible. Specifically, after each participant indicated they had completed their survey packet, the PI or other IRB approved key personnel scanned the packet to ensure that items were not omitted by participants. Participants were provided with another opportunity to respond when omissions were found. Based on these procedures, missing data were minimal (e.g., less than 1% of all participant data).

Scale Reliability. Prior to completing subsequent analyses, all measures that were utilized in this study (i.e., SLSS, PANAS-C, AFHC, PAQ-A, ASHS, AATUS) were analyzed to assess their reliability. Specifically, internal consistencies were computed utilizing Cronbach's alphas and are displayed in Table 7. The Cronbach's alphas ranged between .52 (Adolescent Sleep Hygiene Scale-Physiological Factors) and .91 (Positive and Negative Affect Scale-Positive Affect) indicating generally strong estimates of reliability in this study (Cicchetti, 1994).

Table 7

Cronbach's Alpha for Measures in Study

Measure	Number of Items	Cronbach's Alpha
SLSS	7	.83
PANAS-C (PA)	12	.91
PANAS-C (NA)	15	.90
AFHC	22	.81
PAQ-A	8	.82
ASHS-Physiological Factors	5	.52
ASHS-Behavioral Arousal Factor	3	.58
ASHS-Cognitive/Emotional Factor	6	.76
ASHS-Sleep Environment Factor	5	.66
ASHS-Sleep Stability Factor	3	.68
ASHS-Daytime Sleep Factor	2	.86
ASHS-Substances Factor	2	.72
AATUS-Tobacco Abstinence	4	.63
AATUS-Alcohol Abstinence	2	.70

Note. SLSS= Student Life Satisfaction Scale. PANAS= Positive and Negative Affect Scale. PA = Positive Affect. NA= Negative Affect. AFHC= Adolescent Food Habits Checklist. PAQ-A= Physical Activity Questionnaire for Adolescents. ASHS= Adolescent Sleep Hygiene Scale. AAATUS= Adolescent Alcohol and Tobacco Utilization Scale. *ASHS contains a Bedtime Routine Factor consisting of one item so internal consistency could not be calculated for that scale.

Descriptive Characteristics of the Sample

Descriptive statistics for all the continuous variables of interest in this study are presented in Table 8. The calculation of the SWB score mirrored prior studies, that have included a composite comprised of aggregate, standardized scores for life satisfaction, positive affect, and

negative affect (Antaramian, 2015; Antaramian et al., 2010; Shaffer-Hudkins, 2011; Suldo & Shaffer, 2008; Suldo et al., 2016). Therefore, standardized scores for the SLSS and PANAS-C positive affect scale were added together. The PANAS-C negative affect scale was then standardized and subtracted from the sum utilizing SPSS. Regarding composition of each health-promoting behavior, mean sum scale scores were calculated consistent with each measure's instructions that are described in detail in Chapter 3. Additionally, based on the nature of the measures of health-promotion, factor analysis was completed for each of the scales. Based on the confirmatory factor analysis described in Chapter 3, it was decided that each of Adolescent Sleep Hygiene Scale subscales would be included in the analyses, in lieu of the sum scale score.

Prior to conducting any of the analyses to answer the research questions of interest, assumptions were analyzed for aggregate variables. Box and whisker plots, along with the skew and kurtosis of each variable, were examined to assess for normality. A majority of the variables had skew and kurtosis values within the normal range of -2 to 2. However, the sleep hygiene substance factor (e.g., utilizing tobacco or alcohol products prior to sleeping) and the tobacco and alcohol abstinence scores were outside the normal range for both skew and kurtosis. This is primarily attributed to the infrequent number of participants who endorsed high scores on these measures (e.g., limited utilization of tobacco or alcohol products).

The entire data set was also analyzed to detect for multivariate outliers. Interpretations of the standardized residuals (specifically no residuals of more than 3.3 or less than -3.3, as specified by Pallant, 2011; Tabachnick, Fidell, & Ullman 2007) indicated that no multivariate outliers were detected within the data set, therefore a final sample size of 450 participants was retained for the analyses.

Additional Treatment of Data. Notably, a small portion of participants in this sample indicated utilization of either tobacco or alcohol products. Specifically, 3.1% of the sample noted that they have smoked any cigarettes, 2.9% utilized any cigar products, 2.7% utilized any chewing tobacco, 12% utilized any vaping products, 13.1% identified that they had drank any alcohol, and 6.0% indicated that they had engaged in binge drinking behaviors. Based on the limited number of participants who engaged in these behaviors in comparison to national studies (Centers for Disease Control and Prevention, 2018), and because the measure was initially set to a 7-point scale, with few students reporting excessive utilization of any product, responses were subsequently collapsed into two categories of "abstained (i.e., 1 = health-promoting; complete abstinence from product)" or "utilized (i.e., 0 = health-compromising; any utilization of product)" with greater scores indicating greater abstinence from tobacco and alcohol products in further analyses.

Correlational Analyses

Research Question 1: What is the relationship between specific health-promoting behaviors employed by adolescents (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence) and their subjective well-being?

To answer this question, Pearson product-moment correlation coefficients were calculated for all the continuous variables in this study (see Appendix L). Statistical significance was determined with an alpha level of .05. To gain further clarity in the relationship between the variables of interest, pairwise deletions were utilized for correlational analyses, providing a final sample size of 430 participants for research questions one through four. In terms of the composition of the SWB variable, life satisfaction, positive affect, and negative affect were all significantly correlated. Regarding this first question, SWB was positively correlated with seven

Table 8

Descriptive Statistics of Variables of Interest

Variable	*N*	*M*	*SD*	*Skew*	*Kurtosis*	*Minimum*	*Maximum*
Positive Mental Health							
Subjective Well-Being*	450	0.02	2.37	-0.55	0.04	-10.24	4.98
Life Satisfaction	450	4.26	0.93	-0.51	-0.13	1.00	6.00
Positive Affect	450	3.32	0.87	-0.28	-0.58	1.00	5.00
Negative Affect	450	1.91	0.73	1.14	1.16	1.00	5.00
Health-Promoting Behaviors							
Physical Activity	449	2.45	0.77	0.29	-0.80	1.00	5.00
Diet	449	10.98	4.83	-0.08	-0.72	0.00	23.00
Sleep Hygiene-Physiological Factors	450	4.33	0.91	-0.53	0.30	1.00	6.00
Sleep Hygiene -Behavioral Arousal Factor	449	3.10	1.23	-0.02	-0.80	1.00	6.00
Sleep Hygiene -Cognitive/Emotional Factor	448	3.76	1.08	-0.30	-0.45	1.00	6.00
Sleep Hygiene -Sleep Environment Factor	449	4.86	1.02	-1.28	1.61	1.00	6.00
Sleep Hygiene -Sleep Stability Factor	440	3.01	1.28	1.80	-0.85	1.00	6.00
Sleep Hygiene -Daytime Sleep Factor	450	3.97	1.67	-0.46	1.04	1.00	6.00
Sleep Hygiene -Substances Factor	450	5.81	0.62	-4.67	24.75	1.00	6.00
Sleep Hygiene-Bedtime Routine Factor	447	3.80	1.82	-0.16	-1.40	1.00	6.00
Tobacco Abstinence**	447	0.95	0.14	-4.0	19.17	0.00	1.00
Alcohol Abstinence**	446	0.91	0.25	-2.8	6.82	0.00	1.00

Note. *z-score utilized in analyses. **Maximum score of 1 indicating complete abstinence on each item. Minimum and Maximum values reference potential scores on each measure.

health promoting behaviors: physical activity (r = .33, p < .01), and six subscales of the Adolescent Sleep Hygiene Scale including: Behavioral Arousal (r = .11, p < .05), Sleep Environment (r = .10, p < .05), Sleep Stability (r = .14, p < .05), Daytime Sleep (r = .10, p < .01), Bedtime Routine (r= .17, p < .05) and Cognitive/Emotional Factors (r = .47, p < .01), that had the strongest correlation of all the variables of interest, respectively. The correlations between SWB and the other health-promoting behaviors (e.g., diet, tobacco or alcohol abstinence) were not significant.

Research Question 2: What is the relationship between each of the health-promoting behaviors of interest in this study (e.g., significant correlation between physical activity and tobacco abstinence)?

The correlations between the health-promoting behaviors ranged between -.14 and .54 (see Appendix L). Specifically, the strongest significant correlation was between tobacco and alcohol abstinence (r = .54, p < .01). Additionally, several of the ASHS subscales were significantly correlated. In terms of the strongest correlations between the sleep factors, the ASHS Physiological Factor was positively associated with both the Sleep Environment (r = .52, p < .01), and the Daytime sleep (r = .49, p < .01) factors. Also, diet was most strongly correlated correlated with physical activity (r = .16, p < .01), Sleep Hygiene Physiological Factors (r = .24, p < .01). well as Daytime Sleep Factor score (r = .24, p < .01). In total, the healthy diet score was significantly correlated with nine health-promoting behaviors ranging between .11 and .24. The Daytime Sleep Factor was associated with eight different health-promoting behaviors while the Diet and the ASUS Physiological Factor and Sleep Stability Factors were significantly correlated with seven other health-promoting behaviors.

Multiple Regression Analyses.

Research Question 3: After statistically controlling for race, gender, socioeconomic status, and school, that of the health-promoting behaviors are most strongly related to the subjective well-being of adolescents?

Analysis of assumptions for multiple regression. Prior to interpreting the results of the multiple regression analyses for research questions three through five, assumptions were checked to ensure there were no violations. First, the normal distribution of residuals was examined, and no violations occurred. Next the variance of the SWB variable was examined through visual analyses of plotted residuals, that was found to be homogenous, indicating that no violations occurred. Variables also were checked for multicollinearity. In terms of multicollinearity amongst the health-promoting behaviors and other predictor variables (e.g., race, SES) there were no relationships that were excessively predictive of each other, that could have been a concern when adding these variables into a regression. Lastly, scatter plots between the predictor variables and dependent variables (e.g., SWB) were examined. Visual analyses indicated that each of these relationships were linear in nature. Therefore, no assumptions of multiple regression were violated, and the data set was considered fit for analyses.

To answer research question three, race, socioeconomic status, gender, and school were entered into Model 1 to control for their effects on SWB and to investigate that of the health-promoting behaviors of interest were most strongly predictive of SWB. Race and school were dummy coded prior to being entered into the regression analysis. An alpha level of .05 was utilized to determine statistical significance for these models. Given the small portions of some races reported by participants in this study, those participants who solely endorsed Asian, Pacific Islander, American Indiana/Pacific Islander, or solely "other" were comprised into an

encompassing group entitled "Other" for all multiple regression analyses. To gain further clarity in the relationship between the variables of interest, pairwise deletions were utilized for analyses, providing a final sample size of 430 participants for multiple regression models which examined the main effects of the health-promoting behaviors on SWB. The main effects of Model 1 were not statistically significant from zero, F (10, 439) =1.54, p = .12, R^2 =.034. Specifically, the combination of the demographic factors accounted for 3.4% of the observed variance in SWB and the only statistically significant beta weight was associated with gender (-.18*). Therefore, in this study, girls reported lower levels of SWB when compared to boys.

Model 2 included each of the demographic factors and all 12 health-promoting behaviors as predictors. The linear combination of these factors was statistically different from zero and accounted for 39.80% of the variance in high school aged adolescents SWB F (22, 407) = 12.24, $p < .001$, $R^2 = .398$. As displayed in Table 9, the specific beta weights from the equation indicated that several health-promoting behaviors were identified as statistically significant predictors of SWB. Specifically, sleep hygiene-cognitive emotional factors (β=.53), physical activity (β=.30), sleep-bedtime routine (β=.21) were identified as factors that were significantly related to youth SWB. Participants who rated themselves higher for engagement in these health-promoting behaviors reported higher levels of SWB. The other nine health-promoting behaviors did not significantly contribute to the variance in SWB. Additionally, School B was identified as a unique predictor of SWB with students at that school reporting higher levels of SWB, when compared to School A, that served as the reference group.

Table 9

Hierarchical Regression Analysis for Demographic Factors and Health-Promoting Behaviors Predicting SWB

	Model 1				Model 2			
	N = 450				*N* = 430			
Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Race								
African American[a]	.28	.39	.05	.48	.09	.34	.02	.79
Hispanic [a]	.00	.38	.00	.99	.02	.32	.00	.96
Multiracial [a]	-.06	.49	-.01	.90	-.25	.41	-.03	.54
Other[a]	-.06	.50	-.01	.90	-.36	.42	-.04	.39
Socioeconomic Status								
Free-Reduced Lunch[b]	-.04	.25	-.01	.87	.21	.20	.05	.30
Gender								
Female[c]	-.86	.23	-.18**	.00	-.14	.21	-.03	.50
School								
School B[d]	-.15	.50	-.02	.77	1.18	.43	.12**	.01
School C[d]	-.22	.40	-.03	.58	.35	.34	.05	.31
School D[d]	-.25	.38	-.05	.65	.31	.33	.06	.35
School E[d]	-.08	.49	-.01	.87	.66	.42	.09	.12
Health-Promoting Behaviors								
Physical Activity					.93	.13	.30**	.00
Diet					-.03	.02	-.06	.14
Sleep Hygiene-Physiological Factors					.03	.14	.01	.85
Sleep Hygiene -Behavioral Arousal Factor					-.14	.09	-.07	.14
Sleep Hygiene -Cognitive/Emotional Factor					1.18	.11	.53**	.00
Sleep Hygiene -Sleep Environment Factor					.03	.12	.01	.83
Sleep Hygiene -Sleep Stability Factor					.02	.08	.01	.78
Sleep Hygiene -Daytime Sleep Factor					-.01	.07	-.01	.89

Table 9 (continued).

Variable	*B*	*SE B*	β	*p*
Sleep Hygiene -Substances Factor	.21	.18	.06	.25
Sleep Hygiene-Bedtime Routine Factor	.27	.05	.21**	.00
Tobacco Abstinence	-.35	.91	-.02	.70
Alcohol Abstinence	.65	.47	.07	.17
R^2	.034		.398	

Note. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

Research Question Four*:* To what extent, if any, are the relationships between adolescents' health-promoting behaviors and subjective well-being moderated by various demographic factors (gender, race, socioeconomic status)?

To further investigate the relationship between health-promoting behaviors and SWB, the moderating effects (i.e., interactions with each health-promoting behavior) of each of the demographic variables were examined. For these analyses, an alpha level of .01 was utilized to determine statistical significance based on the number of predictors and interactions being entered into the regression models with four dummy coded variables. Regression models including the interactions of each racial group with each of the 12 health-promoting behaviors was conducted to determine if this interaction accounted for additional variance in SWB beyond the previous models, as previously described (White participants served as the reference group; see Appendix M). When interactions were included, the model was statistically different from zero and accounted for an additional 9.60% of the variance in SWB, $F(70, 359) = 5.00$, $R^2 = .494$. The change in R^2 was not significant $F(48, 359) = 1.41$, $p = .04$. Similar to the model that included the main effects of the health-promoting behaviors, sleep hygiene-cognitive emotional factors (β=.65), physical activity (β=.21), and sleep-bedtime routine (β=.21) were significant predictors. The only significant interaction which was identified was between multiracial youth and physical activity (β=.47)

A regression model including the moderating effects of gender was conducted to determine if the interaction of gender with each of the 12 health-promoting behaviors accounted for additional variance in SWB beyond the previous models, as described previously (see Appendix N). When interactions were included, the model was statistically different from zero and accounted for an additional 2.20% of the variance in SWB, $F(34, 395) = 8.45$, $R^2 = .420$. The

change in R^2 was not statistically significant F (12, 395) = 1.30, p = .21. Similar to the model that included the main effects of the health-promoting behaviors, sleep hygiene-cognitive emotional factors (β=.38), physical activity (β=.32), and sleep-bedtime routine (β=.20) were significant predictors. None of the interactions in the model served as unique predictors of SWB when utilizing an alpha of .01.

A regression model including the moderating effects of socioeconomic status was used to determine if the interaction of socioeconomic status with each of the 12 health-promoting behaviors accounted for additional variance in SWB beyond the previous models, that included the main effects of each demographic factor and the 12 health-promoting behaviors (see Appendix O). When interactions were included, the model was significantly different than zero and accounted for an additional 2.20% of the variance in SWB, F (34, 395) =8.42, R^2=.42. The change in R^2 was not statistically significant F (12, 395) = 1.25, p = .25. Similar to the model that included the main effects of the health-promoting behaviors, sleep hygiene-cognitive emotional factors (β=.56), physical activity (β=.36), and sleep-bedtime routine (β=.19) were significant predictors. None of the interactions in the model served as unique predictors of SWB when utilizing an alpha of .01

Research Question Five: What are the relationships between gender, ethnicity, and socioeconomic status and each of the health-promoting behaviors?

To further examine the relationship between each of the demographic factors and the various health-promoting behaviors, a series of multiple regressions were completed. An alpha level of .05 was utilized to determine statistical significance in these analyses. In each case, race, socioeconomic status, gender, and school were entered into a model with each health-promoting behavior serving as an outcome variable. School was entered into each of the respective models,

to control for effects of demographic differences at each of the participating schools. However, differences between schools were not the primary interest of this study.

The linear combination of the demographic factors was significantly different from zero and accounted for 12.30% of the variance in high school aged adolescent's physical activity levels, $F(10, 438) = 6.15$, $p < .001$, $R^2 = .123$. As displayed in Table 10, the specific beta weights yielded from the equation indicated that gender (β=-.27) was identified as a unique predictor of physical activity. In this case, boys had higher rates of physical activity compared to girls.

Table 10

Regression Analysis for Demographic Factors Predicting Physical Activity

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.23	.12	.12	.06
Hispanic [a]	-.06	.12	-.03	.63
Multiracial [a]	.18	.15	.06	.23
Other[a]	-.08	.16	-.03	.59
Socioeconomic Status				
Free-Reduced Lunch[b]	-.09	.08	-.06	.22
Gender				
Female[c]	-.42	.07	-.27**	.00
School				
School B[d]	-.47	.16	-.15**	.00
School C[d]	-.28	.12	-.13*	.02
School D[d]	-.42	.12	-.27**	.00
School E[d]	-.23	.15	-.10	.13
R^2		.123		

Note. $N = 449$. * $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 10.40% of the variance in high school aged adolescent's healthy diet score, $F(10, 438) = 5.08$, $p < .001$, $R^2 = .104$. As displayed in Table 11, the specific beta weights

yielded from the equation indicated that gender (β=.10) was identified as a unique predictor of a healthy diet. In this case, girls had higher healthy diet scores compared to boys.

Table 11

Regression Analysis for Demographic Factors Predicting Dietary Habits

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.37	.76	.03	.63
Hispanic [a]	.52	.74	.05	.70
Multiracial [a]	1.05	.97	.06	.28
Other[a]	1.11	.98	.06	.26
Socioeconomic Status				
Free-Reduced Lunch[b]	.41	.48	.04	.39
Gender				
Female[c]	.98	.41	.10*	.03
School				
School B[d]	-2.40	.98	-.12*	.02
School C[d]	-3.63	.77	-.26**	.00
School D[d]	-3.27	.74	-.33**	.00
School E[d]	-3.64	.95	-.24**	.00
R^2		.104		

Note. N = 449. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 11.10% of the variance in high school aged adolescents' sleep hygiene physiological factors score, $F(10, 439) = 5.46$, $p < .001$, $R^2 = .111$. As displayed in Table 12, the specific beta weights yielded from the equation identified as African American (-.18) or Hispanic (-.14) were unique predictors of sleep hygiene physiological factors. In this case, African American and Hispanic youth had lower rates of sleep hygiene physiological factors compared to White adolescents.

Table 12

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Physiological Factors

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	-.40	.14	-.18**	.01
Hispanic [a]	-.29	.14	-.14**	.04
Multiracial [a]	-.05	.18	-.02	.77
Other[a]	-.04	.19	-.01	.84
Socioeconomic Status				
Free-Reduced Lunch[b]	-.09	.09	-.05	.32
Gender				
Female[c]	.12	.08	.07	.15
School				
School B[d]	-.75	.19	-.20**	.00
School C[d]	-.20	.15	-.07	.16
School D[d]	-.18	.14	-.09	.20
School E[d]	-.37	.18	-.13*	.04
R^2		.111		

Note. N =450. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was not significantly different from zero and accounted for 3.50% of the variance in high school aged adolescent's sleep hygiene behavioral arousal, $F(10, 438) = 1.22$, $p = .00$, $R^2 = .035$. As displayed in Table 13, the specific beta weights yielded from the equation indicated that there were no unique demographic factor predictors that were associated with sleep hygiene behavioral arousal.

Table 13

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Behavioral Arousal

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	-.08	.20	-.03	.69
Hispanic [a]	-.12	.20	-.04	.53
Multiracial [a]	.10	.26	.02	.70
Other[a]	.26	.26	.05	.31
Socioeconomic Status				
Free-Reduced Lunch[b]	-.13	.13	-.05	.30
Gender				
Female[c]	.15	.12	.06	.20
School				
School B[d]	-.52	.26	-.10*	.05
School C[d]	-.08	.20	-.02	.69
School D[d]	-.06	.19	-.02	.78
School E[d]	-.44	.25	-.12	.08
R^2		.035		

Note. $N = 449$* $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 6.20% of the variance in high school aged adolescent's sleep hygiene cognitive/emotional factors, $F(10, 437) = 6.15$, $p<.01$, $R^2 = .062$. As displayed in Table 14, the specific beta weights yielded from the equation indicated that gender (-.14) was identified as a unique predictor of cognitive/emotional factors related to sleep hygiene. In this case, boys had higher rates of sleep hygiene related to cognitive/emotional factors compared to girls.

Table 14

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Cognitive/Emotional Factor

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	-.22	.18	-.09	.20
Hispanic [a]	-.11	.17	-.05	.51
Multiracial [a]	-.09	.22	-.02	.70
Other[a]	.42	.23	.10	.06
Socioeconomic Status				
Free-Reduced Lunch[b]	-.09	.11	-.04	.39
Gender				
Female[c]	-.31	.10	-.14**	.00
School				
School B[d]	-.54	.23	-.12*	.02
School C[d]	-.18	.18	-.06	.31
School D[d]	-.07	.17	-.03	.70
School E[d]	-.28	.22	-.09	.20
R^2		.062		

Note. N = 448. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 15.70% of the variance in high school aged adolescent's sleep hygiene environmental factors, $F(10, 438) = 8.15$, $p < .001$, $R^2 = .157$. As displayed in Table 15, the specific beta weights yielded from the equation indicated that identifying as African American (β=-.21) was a unique predictor of poor sleep hygiene. Specifically, African Americans had significantly lower rates of sleep hygiene related to environmental factors compared to White adolescents.

Table 15

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Environment Factors

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	-.51	.16	-.21**	.00
Hispanic [a]	-.20	.15	-.09	.19
Multiracial [a]	-.07	.20	-.02	.71
Other[a]	-.02	.20	-.01	.92
Socioeconomic Status				
Free-Reduced Lunch[b]	-.09	.10	-.04	.36
Gender				
Female[c]	-.04	.09	-.02	.65
School				
School B[d]	-.31	.20	-.07	.13
School C[d]	-.30	.16	-.10	.06
School D[d]	-.43	.15	-.21**	.00
School E[d]	-.74	.20	-.23**	.00
R^2		.157		

Note. N = 449. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was not significantly different from zero and accounted for 2.40% of the variance in high school aged adolescent's sleep hygiene sleep stability, $F(10, 429) = 1.08$, $p = .38$, $R^2 = .024$. As displayed in Table 16, the specific beta weights yielded from the equation indicated that none of the demographic factors served as unique predictors in terms of sleep stability.

Table 16

Regression Analysis for Demographic Factors Predicting Sleep Stability

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.11	.21	.04	.62
Hispanic [a]	.07	.21	.02	.75
Multiracial [a]	.23	.27	.05	.39
Other[a]	.12	.27	.02	.65
Socioeconomic Status				
Free-Reduced Lunch[b]	-.10	.13	-.04	.48
Gender				
Female[c]	.04	.13	.02	75
School				
School B[d]	.05	.27	.01	.85
School C[d]	-.46	.22	-.13*	.03
School D[d]	-.31	.21	-.12	.14
School E[d]	-.50	.27	-.13	.06
R^2		.024		

Note. N = 440. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 24.20% of the variance in high school aged adolescent's daytime sleepiness, $F(10, 439) = 14.04$, $p < .001$, $R^2 = .242$ As displayed in Table 17, the specific beta weights yielded from the equation indicated that gender (β=-.19) and identifying as African American (β=-.21) were a unique predictor of daytime sleepiness. In this case, African Americans had lower rates of sleep hygiene related to daytime sleepiness (e.g., more day time sleepiness) when compared to White students, while girls had lower rates of sleep hygiene related to daytime sleepiness compared to boys.

Table 17

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Day Time Sleepiness

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	-.84	.24	-.21*	.00
Hispanic [a]	-.44	.24	-.11	.07
Multiracial [a]	-.26	.31	-.04	.40
Other[a]	-.15	.31	-.02	.63
Socioeconomic Status				
Free-Reduced Lunch[b]	-.22	.15	-.06	.16
Gender				
Female[c]	-.64	.14	-.19**	.00
School				
School B[d]	-.65	.31	-.10*	.04
School C[d]	-.73	.25	-.15**	.00
School D[d]	-1.14	.24	-.33**	.00
School E[d]	-1.18	.30	-.23**	.00
R^2		.242		

Note. $N = 450$. * $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 6.60% of the variance in high school aged adolescent's sleep hygiene substance utilization, $F(10, 439) = 3.09$, $p < .001$ $R^2 = .066$. As displayed in Table 18, the specific beta weights yielded from the equation indicated that gender (β=.13) was identified as a unique predictor of sleep hygiene substance utilization. In this case, girls had higher rates of sleep hygiene related to substances (e.g., not utilizing substances prior to sleeping) when compared to boys.

Table 18

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Substances

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.05	.10	.03	.61
Hispanic [a]	.00	.10	.00	.99
Multiracial [a]	.07	.13	.03	.57
Other[a]	-.40	.13	-.15	.00
Socioeconomic Status				
Free-Reduced Lunch[b]	.04	.06	.03	. 58
Gender				
Female[c]	.17	.06	.13**	.00
School				
School B[d]	-.30	.13	-.12*	.02
School C[d]	-.18	.10	-.10	.07
School D[d]	-.09	.10	-.07	.34
School E[d]	-.05	.13	-.02	.72
R^2		.066		

Note. N= 450. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was not significantly different from zero and accounted for 4.00% of the variance in high school aged adolescent's bedtime routine, $F(10, 436) = 1.80$, $p = .054$, $R^2 = .04$. As displayed in Table 19, the specific beta weights yielded from the equation indicated that identifying as Hispanic (β=.14) served as a unique predictor pertaining to greater adherence to a bedtime routine, when compared to White adolescents.

Table 19

Regression Analysis for Demographic Factors Predicting Sleep Hygiene Bedtime Routine Factor

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.27	.30	.06	.36
Hispanic [a]	.59	.29	.14*	.04
Multiracial [a]	.23	.38	.03	.54
Other[a]	-.04	.38	-.01	.91
Socioeconomic Status				
Free-Reduced Lunch[b]	-.26	.19	-.07	.16
Gender				
Female[c]	.28	.17	.08	.12
School				
School B[d]	-.83	.39	-.11*	.03
School C[d]	-.80	.30	-.15**	.01
School D[d]	-.69	.29	-.18*	.02
School E[d]	-.71	.37	-.13	.06
R^2		.04		

Note. N= 447. **p*<.05, ** *p* <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 6.30% of the variance in high school aged adolescent's abstinence from tobacco products F (10, 436) = 2.95, $p < .01$, $R^2 = .063$. As displayed in Table 20, the specific beta weights yielded from the equation indicated that identifying as African American (β=.16) was a unique predictor of tobacco abstinence. In this case, African Americans had significantly greater rates of abstinence from tobacco products when compared to White adolescents.

Table 20

Regression Analysis for Demographic Factors Predicting Tobacco Abstinence

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.05	.02	.16*	.02
Hispanic [a]	.04	.02	.13	.06
Multiracial [a]	.01	.03	.03	.63
Other[a]	.01	.03	.02	.73
Socioeconomic Status				
Free-Reduced Lunch[b]	.01	.01	.04	.44
Gender				
Female[c]	.03	.01	.09	.06
School				
School B[d]	.01	.03	.03	.63
School C[d]	-.05	.02	-.12*	.04
School D[d]	.01	.02	.03	.69
School E[d]	.01	.03	.03	.66
R^2		.063		

Note. N = 447. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

The linear combination of the demographic factors was significantly different from zero and accounted for 6.00% of the variance in high school aged adolescents' abstinence from alcohol products, $F(10, 435) = 2.76$, $p < .01$, $R^2 = .06$. As displayed in Table 21, the specific beta weights yielded from the equation indicated that identifying as African American (β=.22), Hispanic (β=.16), or Multiracial (β=.17) was a unique predictor of alcohol abstinence. In this case, African American, Hispanic, and Multiracial had greater rates of abstinence from alcohol products when compared to White adolescents.

Table 21

Regression Analysis for Demographic Factors Predicting Alcohol Abstinence

Variable	*B*	*SE B*	β	*p*
Race				
African American[a]	.13	.04	.22**	.01
Hispanic [a]	.09	.04	.16*	.02
Multiracial [a]	.16	.05	.17**	.00
Other[a]	.02	.05	.02	.68
Socioeconomic Status				
Free-Reduced Lunch[b]	.04	.03	.08	.11
Gender				
Female[c]	.01	.02	.02	.72
School				
School B[d]	-.14	.05	-.14**	.00
School C[d]	-.10	.04	-.14*	.01
School D[d]	-.07	.04	-.14	.06
School E[d]	-.09	.05	-.12	.07
R^2		.06		

Note. N= 446. * p<.05, ** p <.01. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

Summary of Significant Findings

Multiple findings were noted pertaining to the variables of interest. Seven of the 12 health-promoting behaviors were significantly correlated with the SWB of high school aged adolescents in this sample. Also, healthy diet score was significantly correlated with nine other health-promoting behaviors, more than any of the other health-promoting behaviors. Furthermore, a substantial portion of the variance in SWB was accounted for by the linear combination of the 12 health-promoting behaviors of interest (39.80%). Specifically, three of the health-promoting behaviors (i.e., physical activity, sleep hygiene cognitive emotional factors, bedtime routine) were unique predictors of increased SWB. With respect to demographics, only gender served as a significant predictor of SWB and only when the demographic characteristics were entered into the first model. Therefore, in this study, boys reported higher levels of SWB,

when compared to girls. Additionally, there were no significant interactions between any of the demographic characteristics and any of the health-promoting behaviors, indicating that there were no moderating effects in any of the analyses. Therefore, it was considered acceptable to interpret the main effects of the health-promoting behaviors, given that no moderating variables influenced the relationship between adolescent's health-promoting behaviors and SWB. Finally, in terms of the main effects of various demographic factors on each of the health-promoting behaviors of interest, at least one racial group served as a unique predictor for six of the health-promoting behaviors and gender served as a unique predictor for five of the health-promoting behaviors. Socioeconomic status did not serve as a unique predictor for any health-promoting behaviors. Sleep hygiene-daytime sleepiness was the only health-promoting behavior to have two demographic characteristics that served as unique predictors (i.e., African-American, girls).

CHAPTER FIVE:
DISCUSSION

This study sought to further understand the relationship between adolescents' physical wellness and positive mental health. Specifically, research questions evaluated (1) the strength and direction of the relationships between various health-promoting behaviors and subjective well-being, (2) the strength and direction between each of the health-promoting behaviors, (3) the influence of each health-promoting behavior on subjective well-being, (4) the moderating role of various demographic factors in the relationship between health-promoting behaviors and subjective well-being, and (5) the relationship between various demographic factors and each of the health-promoting behaviors of interest. This chapter provides an overview of the findings from this study in relation to the research questions of interest and hypotheses, as well as any links with previous literature. Additionally, expansions of the current literature base and clinical implications for school psychology practice are reviewed. Finally, limitations of the current study, avenues for future research, and concluding thoughts are provided.

Examination of the Results

Participants in the current study reported positive appraisals of their current life. Specifically, for global life satisfaction, a core component of SWB, participants reported an average score of 4.26. This score corresponds with the "mildly agree" response metric for questions pertaining to life satisfaction (e.g., "I have a good life."). These findings are consistent with prior studies of high school aged youth that have assessed life satisfaction utilizing the SLSS and with conceptualizations that adolescent youth often report moderate levels of life

satisfaction (Suldo, Minch, & Hearon, 2015; Suldo et al., 2016). Similarly, scores for the affective components of SWB were within the expected ranges and comparable to prior studies (Allan, Lonigan, & Phillips, 2015; Suldo et al., 2016).

In terms of the health-promoting behaviors of interest, the mean physical activity score was 2.45, that is consistent with scores in prior studies of adolescents (Kowalski et al., 2004; Voss et al., 2017), and corresponds with moderate levels of physical activity. The healthy diet average mean score was 10.98 healthy responses out of a possible 23 points. Previous studies have reported the mean number of healthy responses is 11, that corresponds with a moderately healthy diet (Johnson et al., 2002). The scores for the tobacco and alcohol abstinence measures were .95 and .91 respectively, with 1.00 indicating complete abstinence. Therefore, in this sample, very few students self-reported utilizing either alcohol or tobacco products during the past 30 days. Lastly, scores pertaining to the eight subscales of sleep hygiene ranged between 3.01 (e.g., sleep behavioral arousal factor; corresponds with "sometimes" or 40% of time) and 5.81 (sleep substance factor; corresponds with "Frequently, if not always" or 80% of the time). However, the next highest subscale score was 4.86 (e.g., sleep environment factor; corresponds with "quite often" or 60% of the time). Prior studies have indicated scores with ranges between 3.80 (corresponds with "sometimes" or 40% of the time) through 5.10 (corresponds with "Frequently, if not always" or 80% of the time; Lebourgeois et al., 2005; Storfer-Iser, 2013). Therefore, in this study, it again appeared that a low number of participants self-reported having utilized substances, based on their high score of abstinence on the sleep substances measure, comparable to the alcohol and tobacco abstinence scores. Overall, it appeared that the other subscale scores were within the normal range pertaining to adolescent sleep hygiene habits.

Research Question 1: What is the relationship between specific health-promoting behaviors employed by adolescents (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence) and their subjective well-being?

Findings indicated that seven of the 12 health-promoting behaviors were positively correlated with the SWB of high school aged adolescents. This included in order of the strongest relationship to SWB: sleep hygiene cognitive/emotional factors, physical activity, and five additional factors of sleep hygiene including Bedtime Routine, Sleep Stability, Behavioral Arousal, Sleep Environment, and Daytime Sleep. The other five health-promoting behaviors (i.e., healthy diet, tobacco abstinence, alcohol abstinence, sleep hygiene physiological factors, sleep hygiene substances) were not significantly correlated with SWB. None of the health-promoting behaviors were negatively associated with SWB. Therefore, the hypothesis that health-promoting behaviors would be significantly associated with SWB is partially supported.

Notably, cognitive and emotional factors of sleep hygiene had the strongest correlation with SWB. This could be attributed to the fact that questions pertaining to this subscale on the Adolescent Sleep Hygiene Scale related to cognitive appraisals, emotions, and aspects of mental health (e.g., “I go to bed feeling upset”; “I go to bed and worry about things happening at home or at school.”). The other health-promoting behaviors in this study primarily referenced duration or frequency of engagement in a healthy behavior (e.g., “In the last 7 days, on how many evenings did you do sports, dance or play games in that you were very active?” or “I often buy cakes or pastries.”). The correlation between physical activity and SWB is consistent with prior studies in samples of middle school youth (Lindberg & Swanberg, 2006), undergraduate students (Mack et al., 2012) and adults (Blake et al., 2017). Furthermore, the identified relationship between various aspects of sleep hygiene and SWB similarly aligns with prior studies that have

found that sleep quality (Lai, 2018; Weinberg et al., 2016) and sleep duration (Lemola et al., 2013) were associated with the SWB of adults.

The findings from this study were not consistent with associations between positive mental health and healthy dietary practices (Gadermann et al., 2015; Levy, 2003; Lindberg & Swanberg, 2006; Piko, 2006) or prior negative association between SWB and substances utilization (Piko, 2006) and attitudes towards substance utilization (Shaffer-Hudkins, 2011), that had been previously documented in the literature. These discrepancies could be attributed to measurement of the specific behaviors and conceptualizations of well-being in prior studies. In terms of dietary practices, this study utilized a measure that had only been administered to one sample of American youth (Austin et al., 2009), yet has strong empirical evidence in samples of European youth (Johnson et al., 2002). This measure did include multiple items that were altered from the original measures to be more reflective of the dietary practices of American youth. Studies that have previously noted associations between diet and SWB have utilized scores from more comprehensive measures (e.g., Health-Promoting Lifestyle Profile-Nutrition Subscale; Gadermann et al., 2015) or a singular item corresponding to healthy diet (e.g., a single item added to the Children's Depression Inventory; Piko, 2006). Additionally, the Adolescents Food Habit Checklist (Austin et al., 2009) provides a healthy diet score (i.e., out of 23 points) and focuses primarily on general dietary patterns (e.g., "I never have a packed lunch.") whereas prior studies have incorporated measures that required participants to provide an exact number of their servings of a specific food (e.g., "How many servings of fruits do you eat during the day?"; Gadermann, 2016).

Regarding the discrepancy between tobacco/alcohol products and SWB when compared to prior studies, Shaffer-Hudkins (2011) chose to utilize perceptions of substance utilization

(e.g., a health-compromising behavior; "Smoking cigarettes relaxes you" response metric of 0-3), while Piko (2006) analyzed components of the Children's Depression Inventory to account for substance utilization. Whereas, the current study aimed to maintain the theme of health-promoting behaviors and therefore utilized measures from the YRBS (Centers for Disease Control and Prevention, 2018) and augmented scores during the analyses to reflect abstinence. This discrepancy also could be further attributed to participants' understanding of abstinence from alcohol and tobacco products. Specifically, abstinence or utilization of these products could be viewed by participants as a rule or way of life, that is reinforced by adults, as opposed to an effort to promote one's own physical health and in turn one's mental health.

In comparison to prior studies (Shaffer-Hudkins, 2011; Shaffer-Hudkins et al., 2010), some variables have had unique correlations with variables that were utilized to comprise subjective well-being. For example, Shaffer-Hudkins (2011) found that physical activity, sleep, diet, safety habits, and perceptions of substance utilization were all associated with positive affect, yet only two factors (i.e., sleep, attitudes towards substance use) were linked to SWB in the study of middle school youth. In the current study, only three factors were linked to positive affect: sleep cognitive/emotional factors, sleep bed time routine factor, and physical activity, all that also were associated with SWB. However, all seven variables in the current study that were associated with SWB also were associated with life satisfaction, in addition to sleep hygiene physiological factors. Interestingly, the sleep hygiene physiological factor was associated with life satisfaction and negative affect, yet not positive affect or SWB. Also, alcohol abstinence was negatively associated with negative affect, yet neither life satisfaction or positive affect were associated with alcohol abstinence. Bedtime routine was associated SWB, life satisfaction, and positive affect, yet not associated with negative affect. Furthermore, the sleep hygiene

behavioral arousal factor was only associated with negative affect and SWB, but not life satisfaction or positive affect. In summary, the findings from this study provide some evidence that certain health-promoting behaviors may be linked to various components of positive mental health. These results are similar to the findings of prior studies that have identified positive emotions are a predictor of perceptions of physical health (Shaffer-Hudkins et al., 2010) and longevity of life (Diener & Chan, 2011) in samples of youth and adults.

Research Question 2: What is the relationship between each of the health-promoting behaviors of interest in this study (e.g., Is there a significant correlation between physical activity and tobacco abstinence)?

Findings from this study identified several relationships between various health-promoting behaviors of interest. Specifically, the strongest positive association was between tobacco abstinence and alcohol abstinence. The adolescent sleep hygiene scale also had various factors that were positively associated with other sleep hygiene factors. The strongest relationship was between the sleep hygiene physiological factor and the sleep environment factor. Daytime sleepiness was associated with eight other health-promoting behaviors. The only factors that were not associated with daytime sleep included bedtime routine, tobacco abstinence, and alcohol abstinence.

Consistent with typical conceptualizations of health-promotion, healthy diet and physical activity also were positively linked to each other. Interestingly, although not associated with SWB, the healthy diet score was associated with nine other health-promoting behaviors, the most in this study. These factors included physical activity, sleep hygiene physiological factors, sleep hygiene behavioral arousal, sleep hygiene cognitive/emotional factors, sleep environment, sleep stability, and bedtime routine, and alcohol and tobacco abstinence. No formal hypotheses were

formulated regarding this research question. This research question was solely exploratory to gain further clarity into the associations between key variables.

Several of the correlations between the variables of interest are consistent with previous studies. Specifically, in terms of associations between diet and physical activity, these have been consistently associated over time in samples of older adolescents (Maier & Barry, 2015; Sallis et al., 2000). In this study, measures that have generally strong psychometric properties emphasized this relationship. Although not associated with SWB in this study, this could be because the AFHC utilizes a sum score of healthy choices, as opposed to a frequency measure of specific foods or fat intake, that has been tied to physical activity in prior studies (Gadermann et al., 2016; Shaffer-Hudkins, 2011). Furthermore, the correlation between alcohol and tobacco abstinence mirrors studies that have identified these substances as often being utilized together during adolescence (Centers for Disease Controls and Prevention, 2018; Kann et al., 2018; Snelling et al., 2015) and throughout the lifespan (Johnston et al., 2018). Other differences between this study and prior research studies may be related to the conceptualization of variables or the population group of interest.

Research Question 3: After statistically controlling for race, gender, socioeconomic status, and school, that of the health-promoting behaviors are most strongly related to the subjective well-being of adolescents?

Findings from this study indicated that 39.80% of the variance in adolescents' SWB was determined by the linear combination of the 12 health-promoting behaviors and the main effects of the four demographic characteristics (i.e., race, SES, gender, school). Furthermore, three of the health-promoting behaviors were identified as significant predictors of SWB. Specifically, this included sleep hygiene cognitive/emotional factors, physical activity, and the sleep hygiene

bedtime routine factor. None of the other health-promoting behaviors served as unique predictors of the SWB of adolescents in the sample. These results supported the hypothesis that the linear combination of variables would significantly predict the levels of SWB of high school aged adolescents. Furthermore, given that three health-promoting behaviors served as predictors of SWB, the hypothesis that each behavior predict SWB is partially supported.

The amount of the variance in SWB predicted by the linear combination of health-promoting variables was significant, that aligned with the findings from prior studies (Levy, 2003; Shaffer-Hudkins, 2011; Weinberg et al., 2016). However, the combination of variables in this study predicted a greater portion of the variance in comparison to other studies. For example, in a sample of middle school youth, Shaffer-Hudkins (2011) identified 15% of the variance was based on a combination of four health-promoting behaviors (healthy diet, exercise, hours of sleep, safety) and one health-compromising behavior (attitudes towards substances). Furthermore, Levy (2003) found that 28% of the variance in life satisfaction and 40% of the variance in emotional well-being of young adults was predicted by a combination of eight predictors (e.g., general health and safety, nutrition, exercise), while Blake and colleagues identified that 21% of the variance in emotional well-being was dependent upon the physical activity and dietary habits of young adults. Lindberg and Swanberg (2006) concluded that the linear combination of two variables (e.g., diet and safety habits) was not predictive of the SWB of middle school youth. In comparison to studies that included only one health-related behavior, Weinberg and colleagues (2016) identified that 29.1% of the variance in SWB could be attributed to sleep quality and perceived stress, in a sample of young adults.

Of note, the populations and sample sizes of prior studies could have contributed to the percentage of variance in the linear combination of health-related behaviors. For example, the

current study included five schools from multiple states, that added to the diversity of the sample and the number of predictors included in the analyses. Whereas both Levy (2003) and Shaffer-Hudkins completed studies at one educational institution (e.g., one middle school, one college), therefore further limiting the generalizability of those findings. Also, the portion of the variance of SWB in this study is subject to the number of predictor variables that were included in regression models (i.e., 12 health-promoting behaviors), given the predictive and not explanatory nature of multiple regressions (Jeon, 2015). Furthermore, these findings differ from previously conducted studies that have typically included far less predictors (e.g., Blake et al., 2017; Shaffer-Hudkins, 2011) than the 12 in the current study

In terms of significant predictors of SWB in the current study, only two factors of sleep hygiene (i.e., bedtime routine, cognitive/emotional factors) and physical activity were identified as unique predictors. This is consistent with prior research that has identified the positive benefits of physical activity (Blake et al., 2017; Gadermann et al., 2015; Holder et al., 2009; Mack, 2012), sleep quality (Lai et al., 2018; Weinberg et al., 2016), and sleep duration (Lemola et al., 2013) with respect to well-being. Furthermore, the findings from this research expand upon the discussion of Weinberg and colleagues (2016), who emphasized that sleep hygiene should be evaluated from a multifaceted perspective, in lieu of solely examining sleep duration or sleep quality. In this case, the cognitive/emotional factor of sleep hygiene was the strongest predictor of SWB, that could be based on the emotional and affective nature of both constructs.

With respect to the conceptualization of well-being and positive mental health as the outcome variable of interest, various measures and constructs have served as indicators with respect to the specific population of interest in prior studies. The current study utilized a composite score from measures that examine life satisfaction and affect, that is consistent with

the methods employed by several researchers (Blake et al., 2017; Lai, 2018; Mack et al., 2012; Shaffer-Hudkins, 2011). In prior studies, physical activity (Blake et al., 2017; Mack et al., 2012), sleep quality (Lai, 2018), and sleep duration (Shaffer-Hudkins, 2011) are factors that have identified as significant predictors of well-being, consistent with the current study. However, the associations from prior studies could be dependent upon the conceptualization of the outcome variables of interest (e.g., well-being), that have varied across the literature. For example, Lindberg and Swanberg (2006) utilized a single question (i.e., "How are you these days?") as a well-being outcome, whereas other studies have assessed solely for life satisfaction (Gadermannet al., 2015; Holder et al., 2009), while Shaffer-Hudkins' study (2011) and the current investigation utilized a multidimensional construct. Therefore, the consistency as to that health-promoting variables are predictive of well-being should be examined in the context of how well-being in conceptualized and measured (e.g., life satisfaction versus a combination of life satisfaction and affect components).

Research Question 4: To what extent, if any, are the relationships between adolescents' health-promoting behaviors and subjective well-being moderated by various demographic factors (gender, race, socioeconomic status)?

Findings from this study indicated that none of the demographic characteristics that were included in various models served as unique predictors. In terms of main effects, gender was the only demographic characteristic that served as a significant predictor and this was only in the first model that controlled for main effects of the demographic variables. Specifically, in this sample boys reported higher scores for SWB. In terms of the moderating effects, no significant relationships were identified between any of the demographic factors and the 12 health-promoting behaviors. These limited differences could be attributed to the fact that SWB is

typically considered a stable construct across demographic factors (Diener, Scollon, & Lucas, 2009). Past research has noted limited variability across diverse samples of participants in prior published works (Diener, 2000; Huebner et al., 2006). Therefore, the hypothesis that the demographic factors would serve as moderating variables in the relationship between health-promoting behaviors and SWB was not supported.

Given the lack of significant moderators in the various models, results from the main effects with respect to research question three (e.g., model with health-promoting behaviors and no interaction vectors), provide evidence that engagement in health-promoting behaviors was associated with increased SWB, free of the influence of demographic factors, that mirrors the findings of Shaffer-Hudkins (2011). Additionally, in all three of the models that examined the demographic moderators, sleep cognitive/emotional factors, physical activity, and bedtime routine were identified as unique predictors, further verifying the stability of these factors in their contribution to the SWB of adolescents. Based on the demographic differences that have been identified in terms of health-related behaviors (Centers for Disease Control and Preventions, 2018), it is critical to further consider the relationships between health-promoting behaviors and the SWB of adolescents.

Pender (2005) states that health-promotion is fully conceptualized by examining the various individual facilitators and barriers (e.g., perceived benefits of action, interpersonal influence) that exist in terms of engagement in various health-promoting or compromising behaviors. Additionally, Pender (2011) has described that there are other individual cognitive factors that play a role in health-promotion, such as motivation or self-efficacy. For example, self-efficacy has been identified as a factor in adulthood that contributes to engagement in health-related behaviors (Pender, 2005; Srof & Velsor-Friedrich; 2006). Whereas other literature

has identified various forms of social influence at the individual and additional systems (i.e., family, schools, community) may influence lifestyle choices of adolescents and young adults a play a role in the engagement and maintenance of healthy lifestyles throughout various stages of development (Peterson & Bredow, 2009; Samdal & Rowling, 2013).

Furthermore, it is important to consider how health-promotion is aligned with Bronfenbrenner's (1994) Ecological Systems Theory. Evaluating the many interpersonal influences, social roles, settings, and societal patterns that directly impact children's development into adolescence and throughout the lifespan is vital for further assessing the moderating role of demographic factors in the relationship between mental and physical wellness. Specifically, adolescents are at the center of the model (e.g., the microsystem) and layered by various systems that directly influence each subsequent system. The Mesosystem references the interrelations between individuals and places co-located in the microsystem, such as interactions between youth and their parents in terms of health-promotion (e.g., dietary practices in the home). Furthermore, the ecosystem, which references societal structures that are external to a child's immediate influence is tied to health-promotion. For example, a parent's form of employment, which may require evening hours and a lack of adult supervision, may then result in an adolescent not adhering to proper sleep hygiene habits. Last, society at large is viewed from the perspective of the macrosystem, which examines the cultural mechanisms that impact a child's environment. With respect to health-promotion, school districts face pressures to improve state standardized testing scores, which may in turn lead to a reduction in health and physical education courses, and a subsequent lack of knowledge of health-promoting behaviors for adolescents. Given the interplay across systems, health-promotion and positive psychology (e.g., attention to well-being) are influenced by small- and large-scale structures and in turn

contribute to holistic health. Thus, although no moderating relationships were identified, it is important to further consider these factors in the context of individual and systemic health-promotion.

Research Question 5: What are the relationships between gender, ethnicity, and socioeconomic status and each of the health-promoting behaviors (physical activity, dietary habits, components of sleep hygiene, tobacco abstinence, alcohol abstinence)?

Findings from this study identified a main effect and significant contribution to the variance from the linear combination of the demographic factors for nine of the 12 health-promoting behaviors. Significant portions of the variances that could be attributed to the linear combination of these demographic factors ranged between 6.0% (i.e., outcome variable: alcohol abstinence) and 24.4% (i.e., outcome variable: daytime sleepiness). Gender was a unique predictor for five of the health-promoting behaviors (i.e., physical activity, diet, sleep cognitive/emotional factors, daytime sleepiness, sleep substances). Race was a significant predictor for sleep hygiene physiological factor (African American; Hispanic), sleep hygiene environment factor (African American), daytime sleepiness factor (African American), bedtime routine factor (Hispanic), tobacco abstinence (African American), and alcohol abstinence (African American, Hispanic, Multiracial). Socioeconomic status did not serve as a unique predictor for any of the health-promoting behaviors. Daytime sleepiness was the only factor that had multiple unique demographic predictors (gender; African American). Sleep behavioral arousal, sleep stability, and bedtime routine were not significantly predicted by the linear combination of the demographic factors, with variance ranges between 2.4% and 4.0%. Given the variability in these findings, the hypothesis that demographic factors would serve as unique predictors of various health-promoting behaviors is supported.

The findings from this study are consistent with previous literature that has identified demographic discrepancies in terms of health-promoting behaviors. First, with respect to gender, this study identified that boys had higher physical activity scores when compared to girls. This is consistent with previous literature that has identified that boys are more likely to engage in physical activity, particularly through participation and team sports, when compared to girls (Centers for Disease Control, 2018; Pate et al., 2004). The findings of this study could be attributed to the fact that many of the questions on the Adolescents Physical Activity Questionnaire pertain to after school activities, such as team sports, that enable physical activity. In contrast, the findings from this study indicated that girls reported higher healthy diet scores when compared to boys, that is consistent with prior studies (Centers for Disease Control and Prevention; 2018; McCreary & Sasse, 2002; Spencer et al., 2015). Previous studies have indicated that girls typically maintain diets that promote maintenance of a current weight (e.g., dietary patterns). Therefore, differences that were identified on the AFHC could be associated with the fact that participants were asked to assess their general dietary habits (e.g., "I usually avoid eating fried foods"), in lieu of identifying a specific number of servings (e.g., number of fruits and vegetables consumed per day).

In terms of factors of sleep hygiene, both genders served as unique predictors for various components. Specifically, girls were linked to lower scores for sleep hygiene cognitive/emotional factors as well as sleep hygiene related to daytime sleepiness in comparison to boys. These results mirror those of Galland and colleagues (2017) who reported that boys identified greater adherence to sleep hygiene practices. Interestingly, in the current study sample, girls were associated with higher rates of sleep hygiene related to substance utilization (e.g., not utilizing alcohol or tobacco products prior to sleep) although no gender differences

were identified in this study with respect to general tobacco and alcohol abstinence. However, given the mean age of this sample (i.e., 15.70 years old, early high school aged), this association could be related to prior literature that has identified that alcohol and tobacco utilization often begins earlier in boys than girls (Kloos et al., 2009; Kuhn, 2015) and in turn could have contributed to these differences.

This study also identified several racial differences with respect to the health-promoting behaviors of interest. First, African-American participants reported greater rates of abstinence to both alcohol and tobacco products, when compared to White participants, that is consistent with prior literature that has examined nationally representative samples (Centers for Disease Control and Prevention, 2018; Gutman et al., 2011; Kann et al., 2018). Also, Hispanic and Multiracial youth identified with higher rates of abstinence from alcohol products when compared to White youth. These findings somewhat contradict prior literature, that identified that Caucasian and Hispanic youth typically engaged in greater binge drinking, when compared to their African American peers (Centers for Disease Control and Prevention, 2018; Kann et al., 2018). Race did not serve as a unique predictor of physical activity or healthy dietary practices in the current study. These null findings contradict prior research linking African American youth to decreased physical activity and increased engagement in sedentary lifestyles activities (e.g., 3+ hours of television watching per day; Kann et al., 2018; Sirad et al., 2008). Furthermore, these findings do not align with prior research that has identified Caucasian youth as typically reporting increased consumption of servings of fruits and vegetables. These null findings in the current study could be linked to the rather small sample size, in comparison to the prior, large scale studies that have identified demographic differences in these behaviors (e.g., Centers for Disease Control and Prevention, 2018; Kann et al., 2018).

In terms of sleep hygiene, African American and Hispanic youth were linked with decreased sleep hygiene physiological factors when compared to White students. Furthermore, African America youth were tied to decreased sleep hygiene environmental factors and daytime sleepiness, when compared to White students. Whereas, Hispanic youth were uniquely associated with greater adherence to a consistent bedtime routine in comparison to White students. Few studies have investigated racial differences with respect to sleep hygiene. However, some studies have noted that African-American adults report decreased sleep quality, take longer to fall asleep, and take more naps, each of that are associated with poor sleep hygiene (Petrov & Lichstein, 2016). Furthermore, Fox and colleagues (2018) identified that Latino adults are more likely to have sleep debt (e.g., cumulative effects of not getting or less than eight hours of sleep) when compared to White and African-American counterparts, contradicting these findings indicating that Hispanic youth were more likely to engage in a consistent bedtime routine. Therefore, although no prior studies currently describe these racial differences with respect to adolescent sleep hygiene, demographic patterns in sleep hygiene in the current study are somewhat consistent with previously described literature. Specifically, it appears that minority youth are more susceptible to poor sleep hygiene, as compared to their White peers.

In terms of socioeconomic status, no differences were identified with respect to any of the health-promoting behaviors investigated in this study. This is contradictory to the findings of prior studies that have typically associated high socioeconomic status with greater engagement in various health-promoting behaviors (e.g., healthy diet, physical activity; Elgar et al., 2015). However, these null findings could be attributed to multiple factors in the current study. First, this study utilized free and reduced-price lunch status as an indicator of socioeconomic status (e.g., students who received free or reduced-price lunches were considered “low socioeconomic

status"). Although this method has been utilized in prior research studies (Harwell & LeBeau, 2010), other published works have utilized family income as an indicator (Fradkin et al., 2010; Singh, Siahpush, & Kogan, 2010a; Singh, Siahpush, & Kogan; 2010b). Furthermore, other studies that have found differences in socioeconomic status had larger sample sizes (e.g., *N*> 150,000 at each time point; Elgar et al., 2015; nationally representative sample of all 50 U.S. States; Centers for Disease Control and Prevention, 2018; Kann et al., 2018) therefore allowing for smaller effects to be identified and allow for greater clarity into the many individual and systemic factors which influence health-promotion, consistent with developmental ecological viewpoints (Bronfenbrenner, 1994).

Limitations of the Current Study

It should be noted this study was not without limitations. For example, the schools participating in this study were not selected randomly. Instead, reflect a convenience sample of schools who leaders had prior relationships with the PI and doctoral committee. Schools A and E were contacted for participation due to familiarity of the PI with the school administrative personnel. However, the administrators of these schools were interested in learning about the utilization of alcohol and tobacco products in the respective student populations. Schools B, C, and D were chosen based on a school-university partnership designed to increase social-emotional and positive psychology supports within health and physical education curricula. However, those schools were chosen by a district curriculum specialist who attempted to provide a representative sample of students in the cooperating district. In total, various characteristics of each school (e.g., state, free and reduced lunch make up) may limit the ability of the findings to be generalized to populations more reflective of U.S. Census data.

Furthermore, at each respective school site, a convenience sampling method was utilized to ensure that the maximum amount of youth could participate in this study to ensure ample power. In several cases, the populations were not representative of the school at large (e.g., over and underrepresentation of socioeconomic status groups), but did contribute to the overall diversity of the sample. In this study, 9th grade students were largely overrepresented (50.0%) and 12th grade students were largely underrepresented (12.0%). This likely given that health and physical education curriculum throughout the state of Florida is typically embedded within early coursework in secondary school and not required each semester. Despite that various groups were underrepresented; this sample did meet the minimum power analysis to interpret a medium effect size. Finally, with respect to the population, each of the participants in this study was enrolled in a health or physical education class at the time of data collection. Those students who were enrolled in health classes had taken a physical education course during the fall of 2018-2019 school year. Therefore, students in this study were provided with an additional opportunity to engage in physical activity (a significant predictor of increased SWB in this study), that is not the case for all high school aged adolescents in the United States, as more schools begin to decrease the accessibility to physical education courses in secondary schools (Michael, Brener, Lee, Clennin, & Pate, 2019).

An additional limitation of this study pertains to the utilization of solely self-report measures for each of the health-promoting behaviors. Research has identified that adolescents often over- or under-estimate their engagement in behaviors that are not typically tracked during this developmental period (e.g., dietary practices; Hunsberger et al., 2015) and are subject to social desirability (e.g., diminished utilization of alcohol products; Snelling et al., 2015). Although the self-report nature of this study design allowed the researcher to examine

adolescent's perspectives as to the healthy habits they maintain and their perceived well-being, as opposed to parental or teacher report. Diener and Seligman (2002) have identified that examining individual perceptions of well-being is critical given the individualistic nature of United States culture. Furthermore, self-report measures provide greater clarity into habits that may not be formally tracked by adults. For example, actual bedtime routines and habits of adolescents may engage in prior to bed (e.g., spending time on electronic media), unbeknown to their parents.

Another potential limitation of this study pertains to participants' responses in terms of abstinence of tobacco and alcohol products. To conceptualize abstinence from tobacco and alcohol products, the AATUS was based off of commonly utilized components YRBSS, that is often utilized to identify engagement in these health-comprising behaviors and have a strong empirical rationale for utilization in adolescent populations (Centers for Diseases Control and Prevention, 2018). Results from the current study are somewhat inconsistent in terms of the percentage of students who utilize tobacco or alcohol products when compared to national samples. For example, in the current sample only 3.1% identified having smoked a cigarette and 13.1% noted having drank any alcohol during the past 30 days, whereas studies of nationally representative samples of high school aged youth have identified that 8.8% of youth have smoked at least one cigarette and 29.8% of youth had drank at least one drink in the past 30 days (Center for Disease Control and Prevention, 2018). This fact could be associated with social desirability factors related to endorsing engagement in a health-compromising, and otherwise undesirable behaviors and the low response rate. Students who secured parental consent to participate may differ from the general population and those who did not obtain parental consent to participate in this study.

Finally, this study was cross-sectional in nature and utilized a correlational design. Therefore, the long-term stability of these relationships that were identified are limited, based on the singular time point utilized in this study design. However, these findings did provide initial clarity in the relationship between health-promotion and positive mental health and a rational for additional investigation.

Suggestions for Future Research

There are several avenues for future research in terms of health-promotion and positive mental health. First, this study could expand upon the correlational, cross sectional design to enhance the generalizability of these findings. Specifically, utilizing a longitudinal design and measuring participants SWB and engagement in health-promoting behaviors at multiple time points (e.g., start and end of school year; multiple years) could further distinguish if engagement in a specific health-promoting behavior was associated with increased SWB over time and potentially throughout the lifespan. Also, mixed method designs including phenomenological, qualitative interviews could be completed to gain clarity as to why adolescents might participate or refrain from engaging in a health-comprising or health-promoting behavior and how these actions could be related to perceived well-being.

With respect to the study population, future research could incorporate larger and more diverse samples (e.g., beyond populations from two states) to further enhance the ecological validity of this study. Along these lines, increasing the sample size and recruiting more students for participation would allow for a sample that is more representative of high school aged youth, as opposed to most students being enrolled in 9th grade and participating in a health or physical education course during the time of data collection. This notion is warranted to further investigate differences in engagement in the health-promoting behaviors of interest and the SWB

of high school aged youth. Also, obtaining a sample with greater representation of older high school students (e.g., 11th and 12th grade students) could provide clarity to the notion of Harris (2005) who noted as adolescents transition beyond high school, engagement in health-promoting behaviors is vital as they transition to become more independent. Furthermore, based on (a) the demographic impacts that were identified when the health-promoting behaviors of interest served as outcome variables and (b) the lack of moderating effects with respect to SWB, acquiring larger, more diverse sample may further distinguish relationships (e.g., small effects) between factors, health-promoting behaviors, and SWB.

Future studies should incorporate multiple methods for examining participants' health promoting behaviors (Albar et al., 2016; Short et al., 2013). For example, Short and colleagues (2013) reported that examining sleep hygiene from a multifaceted perspective is warranted, as parents often report greater accuracy in sleep duration (as measured in comparison actigraphy monitors) when compared to adolescents. Also, as technology becomes more engrained in 21st century society, measurement of health-promoting behaviors can be more objectively measured and provide researchers with alternative methods to conceptualize and measure health-promotion (e.g., actigraphy monitors; Short et al., 2013; Caltrac accelerometer; Fuller et al., 2013; Ratey, 2008). Additionally, future studies should evaluate the Adolescent Food Habits Checklist (Austin et al., 2008) in a sample larger sample to gain greater clarity as to what factors contribute to the diet of American youth. Future research also could investigate additional health-promoting behaviors (e.g., safety habits) and their relationship to SWB, as this study solely included behaviors that had existing measures. Also, the relationship between various health-promoting behaviors of interest and additional potential moderators (e.g., weight and sleep

quality; Lemola et al., 2013) should be further studied. Investigating the interplay of these variables could play a critical role in the foundational development of interventions.

Given the associations identified between the SWB and psychopathology of high school aged youth that have been identified through a dual-factor model of mental health framework (Suldo et al., 2016), including between group differences related to physical health, further investigation into the interplay of health-promotion and these variables is warranted. Based on the positive physical health benefits associated with increased SWB (e.g., longevity of life, increased perceptions of physical health; Diener & Chan, 2011; Suldo et al., 2016; Suldo & Shaffer, 2008), examination of between DFM group differences categorized by varying levels of psychopathology and SWB, could identify differences in levels of engagement for various health-related behaviors. Aligned with these research avenues, further examining the directionality of the relationship between mental and physical health is warranted. Specifically, positive psychology constructs (i.e., hope and optimistic thinking) have been found to be associated with increased adherence to medication adherence and in turn greater physical health (Berg et al., 2007; Lloyd et al., 2009). Therefore, completing studies that examine the associations of increased SWB on engagement in various health-promoting behaviors is recommended.

Also, given that the findings from this study indicated that multiple health-promoting behaviors influenced SWB (e.g., multiple sleep hygiene components and physical activity), comprehensive programs should be developed to address multiple health-promoting behaviors. The literature base currently lacks a comprehensive health-promotion program that addresses multiple facets of living a healthy lifestyle for adolescents (Conner & Norman, 2017). Therefore, the development of these programs and the completion of further randomized control

trials focused on examining the outcomes of intervention (e.g., increased engagement in specific health-promoting behaviors) and the relationship between various health-promoting behaviors and SWB would provide greater clarity into this relationship. Furthermore, previously developed initiatives (e.g., Fruits and Vegetables Promotion Program; Hoffman et al., 2009; Sleep Smart Program; Wolfson et al; 2015) could be augmented to address multiple health-related behaviors and their ties to subjective well-being.

Contributions to the Literature

Despite the association between SWB and physical health (Friedman & Kern, 2014; Kern, 2015; Zullieg et al., 2005), few studies have examined if happiness is directly associated with engagement in health-promoting behaviors (Gadermann et al., 2015; Lai et al., 2018; Weinberg et al., 2016). Those studies that have been conducted have primarily focused on diet or exercise habits and their links to SWB (Blake et al., 2017; Mack et al., 2012), with little reference to comprehensive examination of various health-promoting behaviors. Furthermore, recent literature has noted the importance of examining the relationship between sleep quality, sleep hygiene, and positive mental health (Weinberg et al., 2016; Lai, 2018) as well as the need to examine all of the factors that may contribute to a healthy profile. Also, literature previously lacked a comprehensive study of multiple health-promoting behaviors in a sample of older adolescents in the United States. One study of early adolescents was completed by Shaffer-Hudkins (2011) in that the relationship between multiple health-promoting behaviors (e.g., including diet, physical activity, sleep, substance, and safety components) and SWB were investigated. The current study expanded upon the work of Shaffer-Hudkins (2011) by examining the relationship between physical and mental health in a sample of high school aged adolescents, a unique developmental age group in that health-compromising behaviors are more

commonly observed, and little is known about the nature of health-promotion. These results add to the empirical understanding of the relationship between physical wellness and positive mental health throughout the lifespan and provide some evidence as to that factors holistically contribute to a healthy profile.

Findings from the current study could lead to the development of comprehensive intervention programs that champion holistic wellness and are currently lacking (Conner & Norman, 2017; Eaton et al., 2012). These programs could be incorporated into governmental public health initiatives (Bourke-Taylor et al., 2012; Kobau et al., 2011) and in school-based practice (Blunden et al., 2016; Samdal & Rowling, 2012). Developed programs could serve as preventive measures for those at risk for future mental (e.g., anxiety disorders) or physical health problems (e.g., childhood obesity; sleep disorders). The findings from this study identified three unique predictors of increased SWB as well as various associations of interest. Therefore, based on the pertinent relationship to SWB and physical activity and sleep hygiene, ecologically based interventions could be developed to focus on providing adolescents with the knowledge of the skills and short- and long-term benefits of engaging in these behaviors. Furthermore, existing interventions or school curriculum (e.g., health and physical education courses) could embed components that address these healthy behaviors (e.g., teaching students about sleep hygiene; Cain et al., 2011). For example, Ratey (2008) has described altering physical education curriculum to include rigorous, cardiovascular components and the links between standardized test scores and social-emotional skills.

Implications for School Psychology Practice

Based on the rise in childhood obesity, sedentary lifestyles, and substance utilization in adolescents in the United States, significant efforts have been initiated to prevent these health-

comprising behaviors, with less attention given to health-promoting behaviors (Centers for Disease Control and Prevention, 2019; Conner & Norman, 2017). More recent governmental initiatives have included the passing of legislation to provide all students with free and healthy lunches to combat the obesity crisis (Harrington, 2017). Also, health and physical education curriculum has been altered to provide students with increased opportunities to engage in more rigorous physical education courses (Ratey, 2008; Michael et al., 2019). However, these health and physical education courses are often reduced or eliminated for financial purposes (Michael et al., 2019). Given that the results of this study identified multiple unique predictors of increased SWB, and given the benefits of increased SWB (e.g., increased academic achievement, greater perceptions of physical health; Suldo et al., 2016), practicing school psychologists should strive to incorporate health promotion into their practice and further advocate for systemic initiatives that can provide students with opportunities to engage in healthy lifestyles, that in turn can contribute to mental and physical health.

With respect to universal prevention or promotion levels, health-promotion efforts should be imbedded within schools to focus on attention to proper sleep hygiene and consistent physical exercise. In terms of general health-promotion, the findings from this study support the notion that the combination of the 12 health-promoting behaviors (e.g., components of sleep hygiene, abstinence from tobacco and alcohol, healthy diet, physical activity) examined contributed significantly to the variance in SWB. Various literature has noted that a barrier to health-promotion is the simple fact that it requires maintenance and rather consistent engagement to reap physical health benefits (Conner & Norman, 2017; Norman & Conner, 2015). Furthermore, adolescence is a period during that lapses in engagement in healthy behaviors may occur (e.g., poor sleep hygiene attention on the weekends, summer breaks; lapses in healthy diet). Thus,

schools should tailor intervention services to provide students with skills to ensure that temporary lapses do not become permanently changed behaviors. To further strengthen these efforts, support staff (e.g., school counselors, school psychologists, school nurses) should advocate for the physical and mental health of all students. Specifically, with their training in a systemic perspective of service delivery, school staff can instruct students how to identify both health-comprising and health-promoting behaviors and even engage in healthy behaviors at school (e.g., physical education classes, healthy school lunches; Harrington, 2017). The findings from this study support that the relationship between healthy-habits and SWB is consistent across various demographic characteristics, further exemplifying the importance of presenting the links between mental and physical wellness in school-based practice and the availability for widespread service delivery.

Based on literature that has identified discretions across various races, genders, and socioeconomic status with respect to health-promoting behaviors (Centers for Disease Control and Prevention, 2018), schools should develop methods to target services to students who may be identified as at risk for low engagement in a health-promoting behavior. The findings from this study support this notion that various demographic differences exist in terms of gender and race, that may be associated with students' engagement or lack thereof in a health-promoting behavior. In terms of tiered levels of service delivery and aligned with a dual-factor model of mental perspective, incorporating services (e.g., psychoeducation) focused on promoting a healthy lifestyle, as reflected in sleep hygiene and physical activity, at the individual and group level could increase the SWB of students who are at risk for low SWB (e.g., Vulnerable youth) or those who are at risk for psychopathology (e.g., Symptomatic but Content youth), and in both cases cultivate more positive outcomes (e.g., academic achievement; Suldo et al., 2016).

This study has also provided evidence for school psychologists to collect data pertaining to health-promoting behaviors and the SWB of adolescents or youth that they may serve at the individual or systemic level. The findings from this study identified that the measures utilized are psychometrically sound for large group administration and the monitoring of desirable outcomes (e.g., life satisfaction; physical activity). It does appear that the monitoring of the health-promoting behaviors of SWB of adolescents can be done utilizing self-report measures, given the autonomy and cognitive abilities of adolescents to track these behaviors and emotions. However, practicing school psychologists could incorporate other data sources (e.g., parental report) to further evaluate healthy lifestyle choices.

Summary

This study is an initial investigation of the association between health-promoting behaviors and the subjective well-being of high school aged adolescents. The findings from this study bring attention to the necessity to educate adolescents on the importance of daily physical activity, attention to sleep hygiene, and how these factors can be tied to mental wellness. Furthermore, the results of this study provide a greater understanding into the combination of health-promoting behaviors (e.g., healthy profiles) and their associations with positive mental health, that is consistent with prior research (Blake et al., 2017; Gadermann et al., 2015; Mack et al., 2012; Shaffer-Hudkins, 2011; Weinberg et al., 2016). With respect to demographic factors, no main effects or moderators were identified in the current study. Future research should investigate the impact of demographic factors in a larger sample, while including multiple measures and viewpoints related to engagement in health-promoting behaviors. In summary, the results of this study suggest that the combination of the health-promoting behaviors account for a sizeable portion of the shared variance of adolescents' SWB, across gender, socioeconomic, and

racial groups. Further investigation into the relationship between mental and physical health is warranted to promote comprehensive wellness and holistic health in adolescents.

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APPENDIX A:

Parent Consent Form

Parental Permission for Children to Participate in Research Involving Minimal Risk

Information for parents to consider before allowing your child to take part in this research study

Pro # __00038119_____

The following information is being presented to help you and your child decide whether or not he/she wishes to be a part of a research study. Please read this information carefully. If you have any questions or if you do not understand the information, we encourage you to ask the researcher.

We are asking you to allow your child to take part in a research study called: **Health-Promoting Behaviors and Subjective Well-Being Among High School Students**

The person who is in charge of this research study is Nicholas David W. Smith. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge. He is being guided in this research by Dr. Kathy L. Bradley-Klug.

The research will be conducted in XXXX County School District.

This research is being sponsored by the Florida Association of School Psychologists.

Purpose of study:

By doing this study, we hope to learn we hope to learn more about what leads to happiness and health during the teenage years. The information that we collect may help us better understand why we should monitor student' healthy behaviors and their happiness. This research will be conducted through having participants complete a series of survey packets.

Why is your child being asked to take part?

We are asking your child to take part in this research study because he/she is enrolled at XXXX County School District and is currently enrolled in a HOPE class.

Study Procedures:

If your child takes part in this study, s/he will be asked to: complete several surveys that will ask about their thoughts, actions, and attitudes towards school, family, and life in general. They will also be asked to complete questions about their daily eating, exercise, sleep, safety habits, and utilization of various substances. Your child will not be asked to complete any other activities aside from completing the survey packet. Participation in this study will take place during one single HOPE class instructional period during the week of March 15th, 2019.

Total Number of Participants

A total of 400 individuals will participate in the study at all sites.

Alternatives / Voluntary Participation / Withdrawal

If you decide not to let your child take part in this study, that is okay. Instead of being in this research study your child can choose not to participate. You should only let your child take part in this study if both of you want to. You or child should not feel that there is any pressure to take part in the study to please the study investigator or the research staff.

If you decide not to let your child take part:

Your child will not be in trouble or lose any rights he/she would normally have.

Your relationship with your child's school will not change.

Your decision to participate or not to participate will not affect your student's status, course grade, recommendations, or access to future courses or training opportunities.

Alternatives to participating in the study include: not participating in this research study.

You can decide after signing this informed consent form that you no longer want your child to take part in this study. We will keep you informed of any new developments that might affect your willingness to allow your child to continue to participate in the study. However, you can decide you want your child to stop taking part in the study for any reason at any time. If you decide you want your child to stop taking part in the study, tell the study staff as soon as you can.

Benefits

The potential benefits to your child include:

We cannot promise that your child will receive benefit from taking part in this research study. However, the information that we collect may help us better understand why we should check student's healthy behaviors and happiness.

Risks or Discomfort

There are no known risks to those who take part in this study.

Compensation

Your child will receive some competition (e.g., pencil) for taking part in this study. If you stop participating before the study is over, they will still receive the compensation.

Costs

It will not cost you anything to let your child take part in the study.

Conflict of Interest Statement

No member of the research team or an immediate family member hold equity interest in, receive personal compensation from, or have a business relationship (e.g., hold a position such as officer, director, partner, trustee, board member, scientific advisory board member, etc.) with an entity (e.g., the sponsor, provider or manufacturer of the product being investigated or equipment/services being offered, or the holder of any ownership interest in a product being investigated) related to the research outlined in this this study.

No member of the research team or an immediate family member have a proprietary interest (including trademark, patent, copyright, licensing agreement or other intellectual property) associated with the research outlined in this proposal (e.g., the drug or device).

Privacy and Confidentiality

We will do our best to keep your child's records private and confidential. We cannot guarantee absolute confidentiality. Your child's personal information may be disclosed if required by law. Certain people may need to see your child's study records. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- Any agency of the federal, state, or local government that regulates this research.
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance.
- The sponsors of this study: the Florida Association of School Psychologists.

We may publish what we learn from this study. If we do, we will not include your child's name. We will not publish anything that would let people know who your child is. All data will be destroyed five years after the final report is filed to the University of South Florida Institutional Review Board.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, or would like to review the study materials please call Nicholas David W. Smith at (724) 599-4315 or email him at smithn1@mail.usf.edu

If you have questions about your child's rights, or have complaints, concerns or issues you want to discuss with someone outside the research, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

You can refuse to sign this form. If you do not sign this form your child will not be able to take part in this research study. However, your child's care outside of this study and benefits will not change. Your authorization to use your child's health information will not expire unless you revoke (withdraw) it in writing. You can revoke this form at any time by sending a letter clearly stating that

you wish to withdraw your authorization to use your child's health information in the research. If you revoke your permission:

- Your child will no longer be a participant in this research study;
- We will stop collecting new information about your child;
- We will use the information collected prior to the revocation of your authorization. This information may already have been used or shared with others, or we may need it to complete and protect the validity of the research; and
- Staff may need to follow-up with your child if there is a medical reason to do so.

To revoke this form, please write to:
Dr. Kathy Bradley-Klug, Ph.D.
Attn: Nicholas Smith
For IRB Study # **00038119**
University of South Florida
College of Education-EDU 105
4202 E. Fowler Ave.
Tampa, FL 33620

While we are conducting the research study, we cannot let you see or copy the research information we have about your child. After the research is completed, you have a right to see the information about your child, as allowed by USF policies. You will receive a signed copy of this form.

Consent for My Child to Participate in this Research Study

I freely give my consent to let my child take part in this study**.** I understand that by signing this form I am agreeing to let my child take part in research. I have received a copy of this form to take with me.

_____ _____
Signature of Parent of the Child Taking Part in Study Date

_____
Printed Name of Parent of the Child Taking Part in Study

Statement of Person Obtaining Informed Consent

I have carefully explained to the person taking part in the study what he or she can expect from their child's participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

_____ _____
Signature of Person Obtaining Informed Consent Date

_____
Printed Name of Person Obtaining Informed Consent

APPENDIX B:

Student Assent Form

Assent of Children to Participate in Research

Title of study: Health-Promoting Behaviors and Subjective Well-Being Among High School Students

Why am I being asked to take part in this research?
You are being asked to take part in a research study about what leads to happiness and health during the teenage years. You are being asked to take part in this research study because you are currently enrolled in XXX School District. If you take part in this study, you will be one of about 400 people to do so.

Who is doing this study?
The person in charge of this study is Nicholas David W. Smith. He is being guided in this research by Dr. Kathy L. Bradley-Klug. However, other research staff may be involved and can act on behalf of the person in charge.

What is the purpose of this study?
By doing this study, we hope to learn we hope to learn more about what leads to happiness and health during the teenage years. The information that we collect may help us better understand why we should monitor student' healthy behaviors and their happiness. This research will be conducted through having participants complete a series of survey packets.

Where is the study going to take place and how long will it last?
The study will be take place in XXXX County School District. You will be asked to participate in one visit that will take about 50 minutes. The total amount of time you will be asked to volunteer for this study is 50 minutes during one school day while you are in your HOPE class during the week of March 15, 2019.

What will you be asked to do?
You will be asked to complete several surveys that will ask you about your thoughts, actions, and attitudes towards school, family, and life in general. You will also be asked to complete questions about your daily eating, exercise, sleep, safety habits, and utilization of various substances. You will not be asked to complete any other activities aside from completing the survey packet.

What things might happen if you participate?
To the best of our knowledge, your participation in this study will not harm you.

Is there benefit to me for participating?
We cannot promise that you will receive benefit from taking part in this research study. However, the information that we collect may help us better understand why we should check student's healthy behaviors and happiness.

What other choices do I have if I do not participate?
You do not have to participate in this research study. Your decision to participate or not to participate will not affect your student status, course grade, recommendations, or access to future courses or training opportunities

Do I have to take part in this study?
You should talk with your parents or guardian and others about taking part in this research study. Your parent or guardian must have signed a parental consent form for you to participate in this study. If you do not want to take part in the study, that is your decision. You should take part in this study because you want to volunteer.

Risks or Discomfort
There are no known risks to those who take part in this study.

Will I receive any compensation for taking part in this study?
You will receive some competition (e.g., pencil) for taking part in this study. If you stop participating before the study is over, you will still receive the compensation.
.

Who will see the information about me?
Your information will be added to the information from other people taking part in the study so no one will know who you are.

Can I change my mind and quit?
If you decide to take part in the study, you still have the right to change your mind later. No one will think badly of you if you decide to stop participating. Also, the people who are running this study may need for you to stop. If this happens, they will tell you when to stop and why.

What if I have questions?

You can ask questions about this study at any time. You can talk with your parents, guardian or other adults about this study. You can talk with the person who is asking you to volunteer by calling Nicholas Smith at (724) 599-4315 or email him at smithn1@mail.usf.edu. If you think of other questions later, you can ask them. If you have questions about your rights as a research participant, you can also call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Assent to Participate

I understand what the person conducting this study is asking me to do. I have thought about this and agree to take part in this study. I have been given a copy of this form.

_____ _____
Name of person agreeing to take part in the study Date

Signature of child agreeing to take part in the study: _____

_____ _____
Printed name & Signature of person providing Information (assent) to subject Date

APPENDIX C:

Student Demographics Form

Demographics Survey

Please check the box that is most appropriate for you.

1) What is your age?

- ☐ 14
- ☐ 15
- ☐ 16
- ☐ 17
- ☐ 18
- ☐ 19

2) What grade are you in?

- ☐ 9th
- ☐ 10th
- ☐ 11th
- ☐ 12^{th}

3) What is you gender

- ☐ Male
- ☐ Female
- ☐ Other

4) Which race/ethnicity best describes you? (check all that apply)

- ☐ American Indian or Alaskan Native
- ☐ Asian
- ☐ African American or Black
- ☐ Pacific Islander
- ☐ Hispanic/ Latino-a
- ☐ Caucasian/ White
- ☐ Other

*This measure is free to the public domain.

APPENDIX D:

Students' Life Satisfaction Scale (SLSS; Huebner, 1991)*

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

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

*This measure is free to the public domain.

APPENDIX E:

Positive and Negative Affect Schedule for Children*

Positive and Negative Affect Scale for Children (PANAS-C; Laurent et al., 1999)

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.	Interested	1	2	3	4	5
2.	Sad	1	2	3	4	5
3.	Frightened	1	2	3	4	5
4.	Excited	1	2	3	4	5
5.	Ashamed	1	2	3	4	5
6.	Upset	1	2	3	4	5
7.	Happy	1	2	3	4	5
8.	Strong	1	2	3	4	5
9.	Nervous	1	2	3	4	5
10.	Guilty	1	2	3	4	5
11.	Energetic	1	2	3	4	5
12.	Scared	1	2	3	4	5
13.	Calm	1	2	3	4	5
14.	Miserable	1	2	3	4	5
15.	Jittery	1	2	3	4	5
16.	Cheerful	1	2	3	4	5
17.	Active	1	2	3	4	5
18.	Proud	1	2	3	4	5
19.	Afraid	1	2	3	4	5
20.	Joyful	1	2	3	4	5
21.	Lonely	1	2	3	4	5
22.	Mad	1	2	3	4	5
23.	Disgusted	1	2	3	4	5
24.	Delighted	1	2	3	4	5
25.	Blue	1	2	3	4	5
26.	Gloomy	1	2	3	4	5
27.	Lively	1	2	3	4	5

*This measure is free to the public domain.

APPENDIX F:

The Adolescent Food Habits Checklist (AFHC; Austin et al., 2009) *

Please circle the response that is right for you most of the time. Follow the arrow when appropriate.

1. I never have lunch away from home.
   a. True b. False
   ↘
   If I am having lunch away from home, I often choose a low-fat option.
   a. True b. False

2. I usually avoid eating fried foods.
   a. True b. False

3. I usually eat a dessert if there is one available.
   a. True b. False

4. I make sure I eat at least one serving of fruit a day.
   a. True b. False

5. I try to keep my overall fat intake down.
   a. True b. False

6. I never buy chips or salty snacks.
   a. True b. False
   ↘
   If I buy chips or salty snacks, I often choose a low-fat brand.
   a. True b. False

7. I never eat sausages or burgers.
   a. True b. False
   ↘
   I avoid eating lots of sausages and burgers.
   a. True b. False

8. I often buy pastries or cakes.
   a. True b. False

9. I try to keep my overall sugar intake down.
   a. True b. False

10. I make sure I eat at least one serving of vegetables or salad a day.
    a. True b. False

11. I don't eat desserts.
    a. True b. False

    If I am having a dessert at home, I try to have something low in fat.
    a. True b. False

    I often have whipped cream on desserts.
    a. True b. False

12. I rarely eat "to-go" meals.
    a. True b. False

13. I try to make sure I eat plenty of fruit and vegetables.
    a. True b. False

14. I often eat sweet snacks between meals.
    a. True b. False

15. I usually eat at least one serving of vegetables (excluding potatoes) or salad with my evening meal.
    a. True b. False

16. I never buy soft drinks.
    a. True b. False

    When I am buying a soft drink, I usually choose a diet drink.
    a. True b. False

17. I never have butter or margarine on bread.
    a. True b. False

    When I put butter or margarine on bread, I usually spread it thinly.
    a. True b. False

18. I never have a packed lunch.
    a. True b. False

    If I have a packed lunch, I usually include some chocolate.
    a. True b. False

19. I never eat snacks between meals.
    a. True b. False

    When I have a snack between meals, I often choose fruit.
    a. True b. False

20. I never have desserts in restaurants.
a. True b. False

If I am having a dessert in a restaurant, I usually choose the healthiest one.
a. True b. False

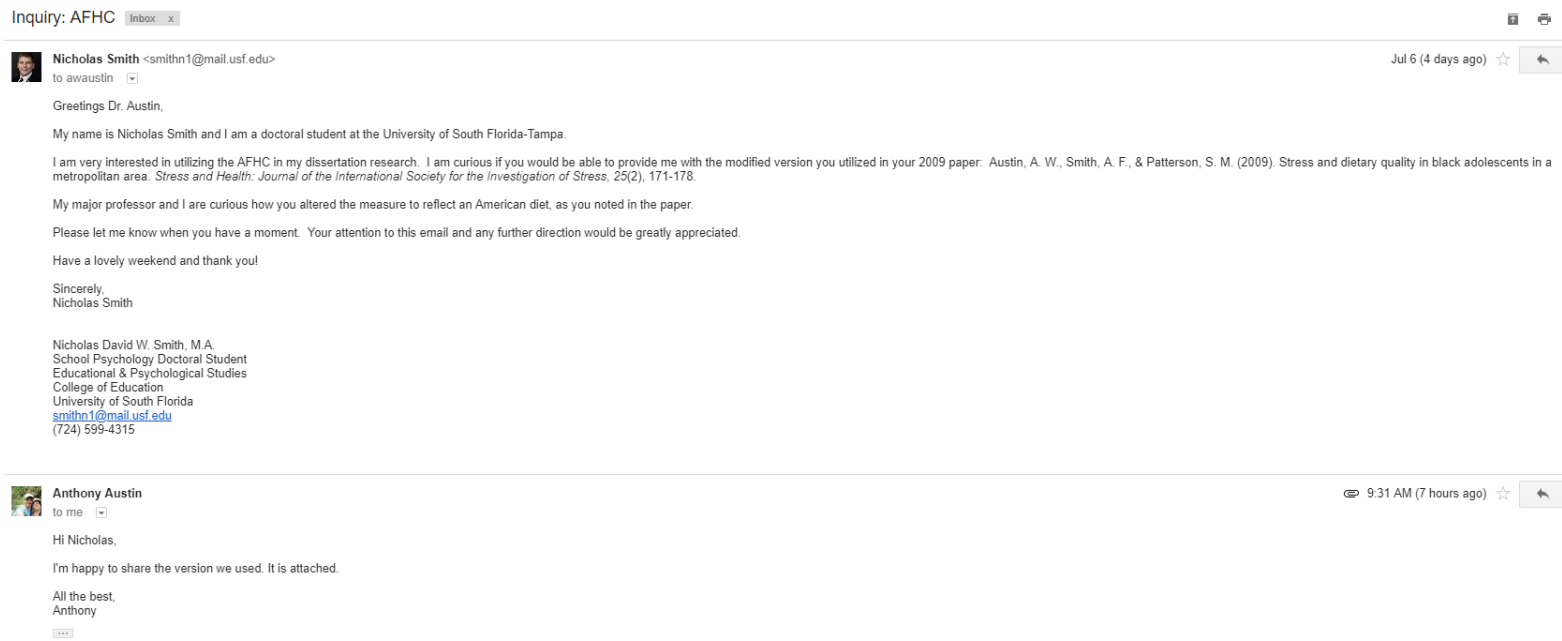
21. I eat at least three servings of fruit most days.
a. True b. False

22. I generally try to have a healthy diet.
a. True b. False

*The PI has received permission to utilize this measure from the developer.

APPENDIX G:

Permission to Utilize the AFHC Modified Version for American Youth (Austin et al., 2009)



Inquiry: AFHC Inbox x

Nicholas Smith <smithn1@mail.usf.edu> Jul 6 (4 days ago)
to awaustin

Greetings Dr. Austin,

My name is Nicholas Smith and I am a doctoral student at the University of South Florida-Tampa.

I am very interested in utilizing the AFHC in my dissertation research. I am curious if you would be able to provide me with the modified version you utilized in your 2009 paper: Austin, A. W., Smith, A. F., & Patterson, S. M. (2009). Stress and dietary quality in black adolescents in a metropolitan area. *Stress and Health: Journal of the International Society for the Investigation of Stress*, *25*(2), 171-178.

My major professor and I are curious how you altered the measure to reflect an American diet, as you noted in the paper.

Please let me know when you have a moment. Your attention to this email and any further direction would be greatly appreciated.

Have a lovely weekend and thank you!

Sincerely,
Nicholas Smith

Nicholas David W. Smith, M.A.
School Psychology Doctoral Student
Educational & Psychological Studies
College of Education
University of South Florida
smithn1@mail.usf.edu
(724) 599-4315

Anthony Austin 9:31 AM (7 hours ago)
to me

Hi Nicholas,

I'm happy to share the version we used. It is attached.

All the best,
Anthony

APPENDIX H:

The Physical Activity Questionnaire for Adolescents (PAQ-A; Kowalski et al., 2004) *

Physical Activity Questionnaire (High School)

Name:_____ Age:_____

Sex: M_____ F_____ Grade:_____

Teacher:_____

We are trying to find out about your level of physical activity from *the last 7 days* (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others.

Remember:

3. There are no right and wrong answers — this is not a test.
4. Please answer all the questions as honestly and accurately as you can — this is very important.

---

1. Physical activity in your spare time: Have you done any of the following activities in the past 7 days (last week)? If yes, how many times? (Mark only one circle per row.)

	No	1-2	3-4	5-6	7 times or more
Skipping	○	○	○	○	○
Rowing/canoeing	○	○	○	○	○
In-line skating	○	○	○	○	○
Tag	○	○	○	○	○
Walking for exercise	○	○	○	○	○
Bicycling	○	○	○	○	○
Jogging or running	○	○	○	○	○
Aerobics	○	○	○	○	○
Swimming	○	○	○	○	○
Baseball, softball	○	○	○	○	○
Dance	○	○	○	○	○
Football	○	○	○	○	○
Badminton	○	○	○	○	○
Skateboarding	○	○	○	○	○
Soccer	○	○	○	○	○
Street hockey	○	○	○	○	○
Volleyball	○	○	○	○	○
Floor hockey	○	○	○	○	○
Basketball	○	○	○	○	○
Ice skating	○	○	○	○	○
Cross-country skiing	○	○	○	○	○
Ice hockey/ringette	○	○	○	○	○
Other:					
_____	○	○	○	○	○
_____	○	○	○	○	○

2. In the last 7 days, during your physical education (PE) classes, how often were you very active (playing hard, running, jumping, throwing)? (Check one only.)

I don't do PE ..... O
Hardly ever ..... O
Sometimes ..... O
Quite often ..... O
Always ..... O

3. In the last 7 days, what did you normally do *at lunch* (besides eating lunch)? (Check one only.)

Sat down (talking, reading, doing schoolwork)..... O
Stood around or walked around ..... O
Ran or played a little bit ..... O
Ran around and played quite a bit ..... O
Ran and played hard most of the time ..... O

4. In the last 7 days, on how many days *right after school*, did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... O
1 time last week ..... O
2 or 3 times last week ..... O
4 times last week ..... O
5 times last week ..... O

5. In the last 7 days, on how many *evenings* did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... O
1 time last week ..... O
2 or 3 times last week ..... O
4 or 5 last week ..... O
6 or 7 times last week ..... O

6. *On the last weekend*, how many times did you do sports, dance, or play games in which you were very active? (Check one only.)

None ..... O
1 time ..... O
2 — 3 times ..... O
4 — 5 times ..... O
6 or more times ..... O

7. Which *one* of the following describes you best for the last 7 days? Read *all five* statements before deciding on the *one* answer that describes you.

F. All or most of my free time was spent doing things that involve little physical effort ..... O

G. I sometimes (1 — 2 times last week) did physical things in my free time (e.g. played sports, went running, swimming, bike riding, did aerobics) ..... O

H. I often (3 — 4 times last week) did physical things in my free time ..... O

I. I quite often (5 — 6 times last week) did physical things in my free time ..... O

J. I very often (7 or more times last week) did physical things in my free time ..... O

8. Mark how often you did physical activity (like playing sports, games, doing dance, or any other physical activity) for each day last week.

	None	Little bit	Medium	Often	Very often
Monday	O	O	O	O	O
Tuesday	O	O	O	O	O
Wednesday	O	O	O	O	O
Thursday	O	O	O	O	O
Friday	O	O	O	O	O
Saturday	O	O	O	O	O
Sunday	O	O	O	O	O

9. Were you sick last week, or did anything prevent you from doing your normal physical activities? (Check one.)

Yes ..... O
No ..... O

If Yes, what prevented you? _____

Scoring

Overall process - Find an activity score between 1 and 5 for each item (excluding item 9)

Five Easy Steps

1) *Item 1 (Spare time activity)*
- Take the mean of all activities ("no" activity being a 1, "7 times or more" being a 5) on the activity checklist to form a composite score for item 1.

2) *Item 2 to 7 (PE, lunch, right after school, evening, weekends, describes you best)*
- The answers for each item start from the lowest activity response and progress to the highest activity response
- Simply use the reported value that is checked off for each item (the lowest activity response being a 1 and the highest activity response being a 5).

3) *Item 8*
- Take the mean of all days of the week ("none" being a 1, "very often" being a 5) to form a composite score for item 8.

4) *Item 9*
- Can be used to identify students who had unusual activity during the previous week, but this question is **NOT** used as part of the summary activity score.

5) How to calculate the final PAQ-A activity summary score
- Once you have a value from 1 to 5 for each of the 8 items (items 1 to 8) used in the physical activity composite score, you simply take the mean of these 8 items, which results in the final PAQ-A activity summary score.

- A score of 1 indicates low physical activity, whereas a score of 5 indicates high physical activity.

*This measure is free to the public domain.

APPENDIX I:

Adolescent Sleep Hygiene Scale (ASHS; Storfer-Isser et al., 2013) *

Adolescent Sleep Hygiene Scale

Directions: Using the choices below, circle *how often* **the following things have happened** *during the past month*.

Never – has not happened
Once in Awhile – happened 20% of the time
Sometimes – happened 40% of the time
Quite Often – happened 60% of the time
Frequently, if not always – happened 80% of the time
Always – happened 100% of the time

		Never (0%)	Once in Awhile (20%)	Sometimes (40%)	Quite Often (60%)	Frequently, if not Always (80%)	Always (100%)
During the day…							
1.	…I take a nap that lasts ***more than*** 1 hour.	N	O	S	Q	F	A
2.	…I play or exercise for ***more than*** 20 minutes.	N	O	S	Q	F	A
After 6:00 in the evening…							
3.	…I have drinks with caffeine (for example: cola, root beer, iced tea, coffee).	N	O	S	Q	F	A
4.	…I take a nap.	N	O	S	Q	F	A
5.	…I do some kind of physical activity (for example: exercise, play sports).	N	O	S	Q	F	A
6.	…I smoke or chew tobacco.	N	O	S	Q	F	A
7.	…I drink beer (or some other drinks with alcohol).	N	O	S	Q	F	A
During the 1 hour before bedtime…							
8.	…I do things that make me feel ***calm or relaxed*** (for example: taking a hot bath/shower, listening to soft music, reading).	N	O	S	Q	F	A
9.	…things happen that make me feel ***strong emotions*** (sadness, anger, excitement).	N	O	S	Q	F	A
10.	…I am ***very active*** (for example: playing outside, running, wrestling).	N	O	S	Q	F	A
11.	…I do things that make me feel ***very awake*** (for example: playing video games, watching TV, talking on the telephone).	N	O	S	Q	F	A
12.	…I drink ***more than*** 4 glasses of water (or some other liquid).	N	O	S	Q	F	A

		Never (0%)	Once in Awhile (20%)	Sometimes (40%)	Quite Often (60%)	Frequently, if not Always (80%)	Always (100%)
I go to bed...							
13.	...and do things in my bed that keep me awake (for example: watching TV, reading).	N	O	S	Q	F	A
14.	...and think about things I ***need*** to do.	N	O	S	Q	F	A
15.	...feeling upset.	N	O	S	Q	F	A
16.	...and replay the day's events over and over in my mind.	N	O	S	Q	F	A
17.	...and worry about things happening at home or at school.	N	O	S	Q	F	A
18.	...with a stomachache.	N	O	S	Q	F	A
19.	...feeling hungry.	N	O	S	Q	F	A
I fall asleep...							
20.	...while listening to loud music.	N	O	S	Q	F	A
21.	...while watching TV.	N	O	S	Q	F	A
22.	...in a ***brightly*** lit room (for example: the overhead light is on).	N	O	S	Q	F	A
23.	...in ***one place*** and then move to ***another place*** during the night.	N	O	S	Q	F	A
24.	...in a room that feels ***too hot*** or ***too cold***.	N	O	S	Q	F	A
I sleep...							
25.	...in a home where someone smokes cigarettes, cigars, or a pipe.	N	O	S	Q	F	A
I...							
26.	...get ***too little*** sleep.	N	O	S	Q	F	A
27.	...use a bedtime routine (for example: bathing, brushing teeth, reading).	N	O	S	Q	F	A
28.	...use my bed for things ***other than sleep*** (for example: talking on the telephone, watching TV, playing video games, doing homework).	N	O	S	Q	F	A
29.	...check my clock several times during the night.	N	O	S	Q	F	A

		Never (0%)	Once in Awhile (20%)	Sometimes (40%)	Quite Often (60%)	Frequently, if not Always (80%)	Always (100%)
During the school week, I...							
30.	...stay up ***more than 1 hour*** past my ***usual*** bedtime. My usual ***school night*** bedtime is ____:____ am pm	N	O	S	Q	F	A
31.	..."sleep in" ***more than 1 hour*** past my ***usual*** wake time. My usual ***school day*** wake time is ____:____ am pm	N	O	S	Q	F	A
On weekends, I...							
32.	...stay up ***more than 1 hour*** past my ***usual*** bedtime. My usual ***weekend*** bedtime is ____:____ am pm	N	O	S	Q	F	A
33.	..."sleep in" ***more than 1 hour*** past my ***usual*** wake time. My usual ***weekend*** wake time is ____:____ am pm	N	O	S	Q	F	A

Scoring of the Adolescent Sleep Hygiene Scale (ASHS)

- The ASHS provides 8 subscale scores and an overall sleep hygiene score.
- Higher scores indicate better success on each of these dimensions of sleep hygiene.
- Response options are scored as follows:
    - Never (6 point)
    - Once in Awhile (5 points)
    - Sometimes (4 points)
    - Quite Often (3 points)
    - Frequently, if not Always (2 points)
    - Always (1 points)
- Reverse-code item 27

Physiological Factor (mean of 5 items)	
3	After 6:00 in the evening, I have drinks with caffeine (e.g., cola, root beer, iced tea, coffee)
10	During the 1 hour before bedtime, I am very active (e.g., playing outside, running, wrestling)
12	During the 1 hour before bedtime, I drink more than 4 glasses of water (or some other liquid)
18	I go to bed with a stomachache
19	I go to bed feeling hungry
Behavioral Arousal Factor (mean of 3 items)	
11	During the 1 hour before bedtime, I do things that make me feel very awake (e.g., playing video games, watching TV, talking on the telephone)
13	I go to bed and do things in my bed that keep me awake (e.g., watching TV, reading)
28	I use my bed for things other than sleep (e.g., talking on the telephone, watching TV, playing video games, doing homework)
Cognitive/Emotional Factor (mean of 6 items)	
14	I go to bed and think about things I need to do
16	I go to bed and replay the day's events over and over in my mind
29	I check my clock several times during the night
9	During the 1 hour before bedtime, things happen that make me feel strong emotions (e.g., sadness, anger, excitement)
15	I go to bed feeling upset
17	I go to bed and worry about things happening at home or at school
Sleep Environment Factor (mean of 5 items)	
20	I fall asleep while listening to loud music
21	I fall asleep while watching TV
22	I fall asleep in a brightly lit room (e.g., the overhead light is on)
24	I fall asleep in a room that feels too hot or too cold
23	I fall asleep in one place and then move to another place during the night

Sleep Stability Factor (mean of 3 items)	
30	During the school week, I stay up more than 1 hour past my usual bedtime
32	On weekends, I stay up more than 1 hour past my usual bedtime
33	On weekends, I "sleep in" more than 1 hour past my usual wake time
Daytime Sleep Factor (mean of 2 items)	
1	During the day, I take a nap that lasts more than 1 hour
4	After 6:00 in the evening, I take a nap
Substances Factor (mean of 2 items)	
6	After 6:00 in the evening, I smoke or chew tobacco
7	After 6:00 in the evening, I drink beer (or some other drinks with alcohol)
Bedtime Routine Factor (value for 1 item)	
27	I use a bedtime routine (e.g., bathing, brushing teeth, reading)

TOTAL ASHS SCORE – (mean of all 8 subscales)

Items that are not part of a subscale or the total ASHS score but were included in the ASHS due to theoretical interest:

- During the day, I play or exercise for more than 20 minutes
- After 6:00 in the evening, I do some kind of physical activity (e.g., exercise, play sports)
- During the 1 hour before bedtime, I do things that make me feel calm/relaxed (e.g., taking a hot bath/shower, listening to soft music, reading)*
- I sleep in a home where someone smokes cigarettes, cigars or a pipes
- I get too little sleep
- During the school week, I "sleep in" more than 1 hour past my usual wake time

*This measure is free to the public domain

APPENDIX J:

Adolescent Alcohol and Tobacco Utilization Scale (Center for Disease Control and Prevention, 2018)

Using the choices below, circle how often you utilize the following substances.

During the past **30 days**…..							
1. On how many days did you **smoke cigarettes**?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
2. On how many days did you **smoke cigars, cigarillos, or little cigars**?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
3. On how many days did you use **chewing tobacco**, **snuff, dip, snus, or dissolvable tobacco products** (such as Copenhagen, Grizzly, Skoal, or Camel Snus; Do not count any electronic vapor products)?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
4. On how many days did you use an **electronic vapor product** (such as JUUL, Vuse, MarkTen, and blu. Electronic vapor products include e-cigarettes, vapes, vape pens, e-cigars, ehookahs, hookah pens, and mods)?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
5. On how many days did you have **at least one drink of alcohol** (This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. This does not include drinking a few sips of wine for religious purposes)?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days
6. On how many days did you have **4 or more drinks** of alcohol in a row, that is, within a couple hours (if you are female) **or 5 or more drinks** of alcohol in a row, that is, within a couple of hours (if you are male)?	0 days	1 to 2 days	3 to 5 days	6 to 9 days	10 to 19 days	20 to 29 days	All 30 days

*This measure is free to public domain.

APPENDIX K:

Institutional Review Board Letter of Research Approval

USF
UNIVERSITY OF
SOUTH FLORIDA

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

1/14/2019

Nicholas David Smith
Educational and Psychological Studies
14249 Monterey Pines Dr. Unit 101
Tampa, FL 33613

RE: **Expedited Approval for Initial Review**
IRB#: Pro00038119
Title: Health-Promoting Behaviors and Subjective Well-Being Among High School Students

Study Approval Period: 1/11/2019 to 1/11/2020

Dear Mr. Smith:

On 1/11/2019, 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):
Protocol

Consent/Assent Document(s)*:
Adult Minimal Risk Consent Form.pdf
Assent Form .pdf
Parent Consent Form.pdf

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved.

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:

(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.

Research Involving Children as Subjects: 45 CFR 46.404
This research involving children as participants was approved under 45 CFR 46.404: Research not involving greater than minimal risk to children is presented.

Requirements for Assent and/or Permission by Parents or Guardians: 45 CFR 46.408
Permission of one parent is sufficient. Assent is required of all children.

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) business 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,

Melissa Sloan, PhD, Vice Chairperson
USF Institutional Review Board

APPENDIX L:

Correlation Matrix Between Variables of Interest

Correlations Between Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SWB***	-														
2. Life Satisfaction	.87**	-													
3. Positive Affect	.79*	.59**	-												
4. Negative Affect	-.74**	-.50**	-.29**	-											
5. Physical Activity	.33*	.28**	.37**	-.13**	-										
6. Diet	.01	.01	-.01	-.02	.16**	-									
7. Sleep Hygiene-PF	.09	.12*	-.06	-.15**	-.14**	.24**	-								
8. Sleep Hygiene -BAF	.11*	.08	-.02	-.20**	.02	.18**	.37**	-							
9. Sleep Hygiene -CEF	.47**	.41**	.22*	-.51*	.07	.02	.38**	.44**	-						
10. Sleep Hygiene -SEF	.10*	.13**	.02	-.10	.04	.22**	.52**	.37**	.34**	-					
11. Sleep Hygiene -SSF	.14*	.10*	.09	-.14**	.07	.20**	.17**	.39**	.29**	.20**	-				
12. Sleep Hygiene -DSF	.10*	.10*	.05	-.09*	.13**	.24**	.49**	.27**	.23**	.44**	.21**	-			
13. Sleep Hygiene-SF	.09	.10*	.05	-.06	.00	.07	.21**	-.01	.03	.15**	.00	.11*	-		
14. Sleep Hygiene-BRF	.17*	.17*	.18**	-.07	.06	.17**	-.06	-.06	-.08	-.01	.01	.03	.07	-	
15. Tobacco Abstinence	.08	.08	.04	-.06	.00	.11*	.07	.02	.04	.01	.08	.05	.49*	.10*	-
16. Alcohol Abstinence	.09	.05	.04	-.13**	-.02	.11*	.11*	.02	.03	.00	.10*	.01	.40*	.07	.54**

Note. N = 430. * p<.05, **p<.01, ***= z-score utilized. SWB= Subjective Well-Being. PF= Physiological Factors. BAF= Behavioral Arousal Factors. CEF= Cognitive/Emotional Factors. SEF= Sleep Environment Factors. SSF= Sleep Stability Factor. DSF=Daytime Sleep Factor. SF=Substances Factor. BRF= Bedtime Routine Factor.

APPENDIX M:

Moderating Effects of Race on Health-Promoting Behaviors Predicting SWB

	Model 1				Model 2			
	N = 430				*N* = 430			
Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Race								
African American[a]	.09	.34	.02	.79	11.83	5.35	2.05*	.03
Hispanic [a]	.02	.32	.00	.96	1.84	3.07	.33	.55
Multiracial [a]	-.25	.41	-.03	.54	12.38	11.98	1.37	.30
Other[a]	-.36	.42	-.04	.39	.24	5.07	.03	.96
Socioeconomic Status								
Free-Reduced Lunch[b]	.21	.20	.05	.30	.23	.22	.05	.29
Gender								
Female[c]	-.14	.21	-.03	.50	-.08	.22	-.02	.72
School								
School B[d]	1.18	.43	.12**	.01	1.24	.45	.13*	.01
School C[d]	.35	.34	.05	.31	.44	.36	.06	.22
School D[d]	.31	.33	.06	.35	.27	.34	.06	.42
School E[d]	.66	.42	.09	.12	.59	.44	.08	.18
Health-Promoting Behaviors								
Physical Activity	.93	.13	.30**	.00	.65	.20	.21**	.00
Diet	-.03	.02	-.06	.14	-.03	.04	-.07	.36
Sleep Hygiene-Physiological Factors	.03	.14	.01	.85	-.18	.23	-.07	.00
Sleep Hygiene -Behavioral Arousal Factor	-.14	.09	-.07	.14	-.09	.15	-.05	.56
Sleep Hygiene -Cognitive/Emotional Factor	1.18	.11	.53**	.00	1.47	.16	.65**	.00
Sleep Hygiene -Sleep Environment Factor	.03	.12	.01	.83	.15	.22	.06	.49

Appendix M (continued).

Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Sleep Hygiene -Sleep Stability Factor	.02	.08	.01	.78	-.23	.13	-.12	.09
Sleep Hygiene -Daytime Sleep Factor	-.01	.07	-.01	.89	.25	.12	.18	.04
Sleep Hygiene -Substances Factor	.21	.18	.06	.25	.79	.38	.21	.04
Sleep Hygiene-Bedtime Routine Factor	.27	.05	.21**	.00	.28	.09	.21**	.00
Tobacco Abstinence	-.35	.91	-.02	.70	-1.07	1.17	-.06	.36
Alcohol Abstinence	.65	.47	.07	.17	.49	.59	.05	.40
Interactions with African American Participants								
Physical Activity * AA					.01	.36	.00	.98
Diet * AA					-.07	.07	-.13	.31
Sleep Hygiene-Physiological Factors * AA					.07	.36	.05	.86
Sleep Hygiene -Behavioral Arousal Factor * AA					-.08	.25	-.04	.77
Sleep Hygiene -Cognitive/Emotional * AA					-.55	.28	-.35	.05
Sleep Hygiene -Sleep Environment Factor * AA					-.31	.33	-.24	.34
Sleep Hygiene -Sleep Stability Factor * AA					.40	.23	.22	.09
Sleep Hygiene -Daytime Sleep Factor * AA					-.39	.19	-.24	.04
Sleep Hygiene -Substances Factor * AA					-1.40	.59	-1.42	.02
Sleep Hygiene-Bedtime Routine Factor * AA					-.04	.14	-.03	.79
Tobacco Abstinence * AA					1.38	5.51	.24	.80
Alcohol Abstinence * AA					-.27	1.54	-.05	.86
Interactions with Hispanic Participants								
Physical Activity * HIS					.07	.35	.03	.84
Diet * HIS					.03	.05	.07	.61
Sleep Hygiene-Physiological Factors * HIS					.22	.36	.17	.55
Sleep Hygiene -Behavioral Arousal Factor * HIS					-.14	.24	-.09	.55
Sleep Hygiene -Cognitive/Emotional * HIS					-.52	.27	-.37	.06
Sleep Hygiene -Sleep Environment Factor * HIS					.23	.31	-.21	.46
Sleep Hygiene -Sleep Stability Factor * HIS					.46	.21	.28	.03
Sleep Hygiene -Daytime Sleep Factor * HIS					-.28	.18	-.21	.13
Sleep Hygiene -Substances Factor * HIS					.20	.52	.21	.71
Sleep Hygiene-Bedtime Routine Factor * HIS					-.11	.14	-.09	.42
Tobacco Abstinence * HIS					.45	2.45	.08	.85
Alcohol Abstinence * HIS					-1.03	1.45	-.18	

Appendix M (continued).

Variable	*B*	*SE B*	β	*p*
Interactions with Multiracial Participants				
Physical Activity * MUL	1.65	.54	.47**	.00
Diet * MUL	.02	.14	.02	.90
Sleep Hygiene-Physiological Factors * MUL	.76	.92	.37	.41
Sleep Hygiene -Behavioral Arousal Factor * MUL	-.01	.46	-.00	.95
Sleep Hygiene -Cognitive/Emotional * MUL	-.50	.61	-.21	.41
Sleep Hygiene -Sleep Environment Factor * MUL	.44	.56	.24	.43
Sleep Hygiene -Sleep Stability Factor * MUL	.19	.39	.08	.62
Sleep Hygiene -Daytime Sleep Factor * MUL	-.25	.36	-.11	.49
Sleep Hygiene -Substances Factor * MUL	-3.66	1.63	-2.39	.03
Sleep Hygiene-Bedtime Routine Factor * MUL	.20	.33	.09	.55
Tobacco Abstinence * MUL	2.58	7.72	.28	.74
Alcohol Abstinence * MUL	-1.51	4.99	-.16	.76
Interactions with Other Participants				
Physical Activity * OTH	.86	.61	.22	.16
Diet * OTH	-.07	.10	-.10	.46
Sleep Hygiene-Physiological Factors * OTH	1.13	.65	.53	.09
Sleep Hygiene -Behavioral Arousal Factor * OTH	-.12	.43	-.04	.78
Sleep Hygiene -Cognitive/Emotional * OTH	-.43	.50	-.19	.40
Sleep Hygiene -Sleep Environment Factor * OTH	-.21	.62	-.10	.74
Sleep Hygiene -Sleep Stability Factor * OTH	.35	.39	.13	.37
Sleep Hygiene -Daytime Sleep Factor * OTH	-.32	.33	-.15	.34
Sleep Hygiene -Substances Factor * OTH	-.99	.60	-.58	.10
Sleep Hygiene-Bedtime Routine Factor * OTH	-.16	.31	-.06	.62
Tobacco Abstinence * OTH	1.70	3.80	.17	.66
Alcohol Abstinence * OTH	1.54	2.13	.15	.47
R^2	.398	.494		
F for change in R^2		1.41		

Note. * $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A. AA = African American. HIS=Hispanic. MUL= Multiracial. OTH= Other.

APPENDIX N:

Moderating Effects of Gender on Health-Promoting Behaviors Predicting SWB

	Model 1				Model 2			
	N = 430				*N* = 430			
Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Race								
African American[a]	.09	.34	.02	.79	.09	.34	.02	.79
Hispanic [a]	.02	.32	.00	.96	.05	.32	.01	.89
Multiracial [a]	-.25	.41	-.03	.54	-.33	.42	-.04	.43
Other[a]	-.36	.42	-.04	.39	-.37	.42	-.04	.38
Socioeconomic Status								
Free-Reduced Lunch[b]	.21	.20	.05	.30	.21	.21	.04	.32
Gender								
Female[c]	-.14	.21	-.03	.50	-2.63	2.31	-.55	.26
School								
School B[d]	1.18	.43	.12**	.01	1.23	.44	.13**	.01
School C[d]	.35	.34	.05	.31	.38	.35	.05	.29
School D[d]	.31	.33	.06	.35	.31	.34	.06	.36
School E[d]	.66	.42	.09	.12	.62	.43	.08	.15
Health-Promoting Behaviors								
Physical Activity	.93	.13	.30**	.00	.99	.19	.32**	.00
Diet	-.03	.02	-.06	.14	.01	.03	.01	.87
Sleep Hygiene-Physiological Factors	.03	.14	.01	.85	.32	.21	.12	.13
Sleep Hygiene -Behavioral Arousal Factor	-.14	.09	-.07	.14	-.07	.15	-.04	.63
Sleep Hygiene -Cognitive/Emotional Factor	1.18	.11	.53**	.00	.85	.17	.38**	.00

Appendix N (continued).

Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Sleep Hygiene -Sleep Environment Factor	.03	.12	.01	.83	-.09	.19	-.04	.64
Sleep Hygiene -Sleep Stability Factor	.02	.08	.01	.78	-.02	.12	-.01	.88
Sleep Hygiene -Daytime Sleep Factor	-.01	.07	-.01	.89	-.10	.12	-.07	.38
Sleep Hygiene -Substances Factor	.21	.18	.06	.25	.24	.23	.06	.31
Sleep Hygiene-Bedtime Routine Factor	.27	.05	.21**	.00	.26	.08	.20**	.00
Tobacco Abstinence	-.35	.91	-.02	.70	-1.25	1.34	-.07	.35
Alcohol Abstinence	.65	.47	.07	.17	.23	.79	.03	.76
Interactions with Gender								
Physical Activity * Gender					-.07	.27	-.04	.80
Diet * Gender					-.06	.04	-.17	.18
Sleep Hygiene-Physiological Factors * Gender					-.54	.29	-.51	.06
Sleep Hygiene -Behavioral Arousal Factor * Gender					-.13	.19	-.10	.48
Sleep Hygiene -Cognitive/Emotional Factor * Gender					.54	.22	.45*	.01
Sleep Hygiene -Sleep Environment Factor * Gender					.18	.24	.19	.46
Sleep Hygiene -Sleep Stability Factor * Gender					.10	.17	.07	.53
Sleep Hygiene -Daytime Sleep Factor * Gender					.15	.14	.14	.30
Sleep Hygiene -Substances Factor * Gender					.00	.38	.01	.98
Sleep Hygiene-Bedtime Routine Factor * Gender					.01	.11	.01	.96
Tobacco Abstinence * Gender					1.49	1.83	.30	.42
Alcohol Abstinence * Gender					.73	.11	.01	.93
R^2		.398				.42		
F for change in R^2						1.30		

Note. * $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A.

APPENDIX O:

Moderating Effects of SES on Health-Promoting Behaviors Predicting SWB

	Model 1				Model 2			
	N = 430				*N* = 430			
Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Race								
African American[a]	.09	.34	.02	.79	.09	.34	.02	.79
Hispanic [a]	.02	.32	.00	.96	.05	.32	.01	.89
Multiracial [a]	-.25	.41	-.03	.54	-.33	.42	-.04	.43
Other[a]	-.36	.42	-.04	.39	-.37	.42	-.04	.38
Socioeconomic Status								
Free-Reduced Lunch[b]	.21	.20	.05	.30	3.44	2.32	.72	.14
Gender								
Female[c]	-.14	.21	-.03	.50	-.14	.21	-.03	.52
School								
School B[d]	1.18	.43	.12**	.01	1.38	.44	.15**	.00
School C[d]	.35	.34	.05	.31	.48	.35	.07	.38
School D[d]	.31	.33	.06	.35	.30	.34	.06	.38
School E[d]	.66	.42	.09	.12	.72	.42	.10	.09
Health-Promoting Behaviors								
Physical Activity	.93	.13	.30**	.00	1.13	.18	.36**	.00
Diet	-.03	.02	-.06	.14	-.00	.03	-.01	.92

Appendix O (continued).

Variable	*B*	*SE B*	β	*p*	*B*	*SE B*	β	*p*
Sleep Hygiene-Physiological Factors	.03	.14	.01	.85	.20	.20	.08	.31
Sleep Hygiene -Behavioral Arousal Factor	-.14	.09	-.07	.14	-.12	.13	-.06	.38
Sleep Hygiene -Cognitive/Emotional Factor	1.18	.11	.53**	.00	1.26	.14	.56**	.00
Sleep Hygiene -Sleep Environment Factor	.03	.12	.01	.83	-.14	.18	-.06	.43
Sleep Hygiene -Sleep Stability Factor	.02	.08	.01	.78	.12	.12	.07	.32
Sleep Hygiene -Daytime Sleep Factor	-.01	.07	-.01	.89	-.11	.11	-.07	.32
Sleep Hygiene -Substances Factor	.21	.18	.06	.25	.42	.25	-.07	.32
Sleep Hygiene-Bedtime Routine Factor	.27	.05	.21**	.00	.25	.09	.19**	.00
Tobacco Abstinence	-.35	.91	-.02	.70	-.30	1.09	-.05	.40
Alcohol Abstinence	.65	.47	.07	.17	.72	.59	.07	.22
Interactions with Gender								
Physical Activity * Gender					-.47	.27	.26	.09
Diet * Gender					-.06	.04	-.15	.20
Sleep Hygiene-Physiological Factors * Gender					-.41	.30	-.38	.16
Sleep Hygiene -Behavioral Arousal Factor * Gender					-.03	.19	-.02	.86
Sleep Hygiene -Cognitive/Emotional Factor * Gender					-.13	.21	-.11	.53
Sleep Hygiene -Sleep Environment Factor * Gender					.32	.24	.33	.18
Sleep Hygiene -Sleep Stability Factor * Gender					-.18	.17	-.13	.29
Sleep Hygiene -Daytime Sleep Factor * Gender					.19	.14	.17	.17
Sleep Hygiene -Substances Factor * Gender					-.37	.37	-.45	.31
Sleep Hygiene-Bedtime Routine Factor * Gender					.05	.11	.04	.66
Tobacco Abstinence * Gender					2.39	1.97	.49	.23
Alcohol Abstinence * Gender					-1.26	1.06	-.26	.24
R^2		.398				.42		
F for change in R^2						1.25		

Note. * $p<.05$, ** $p<.01$. [a]Reference Race group is White. [b]Reference group is non-free or reduced-price lunch. [c]Reference group is males. [d]Reference group is School A. SES=Socioeconomic Status.