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Health-Promoting Behaviors and Subjective Well-Being among Early Adolescents

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Health-Promoting Behaviors and Subjective Well-Being among Early Adolescents

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
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moderating

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DEDICATION

This dissertation is dedicated to my loving husband, Michael, for his unending encouragement during this journey. Through laughter and tears, you have been with me at every step and the end is so wonderful because you are in it.

I also dedicate this dissertation to my parents, Bill and Jeanne. Thank you for teaching me to work hard, live with integrity, and look to Christ for the kind of strength only He could provide me during the ups and downs. To all of my friends and family – I have been so very blessed to have your support over these years.

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ABSTRACT

This study investigated the specific health-promoting behaviors employed by early adolescents ($n = 246$) and their subjective well-being (SWB) to provide an understanding of how mental and physical wellness relate in teens. Participants self-reported on their dietary habits, physical activity, sleep hygiene, safety habits, and attitudes toward substance use. A comprehensive assessment of SWB was also gathered (i.e., global life satisfaction, positive affect, and negative affect). The researcher hypothesized that each of the five health-promoting behaviors assessed in the current study would have significant, positive correlations with the SWB of early adolescents, in that youth who reported higher levels of engagement in these healthy behaviors also would report higher levels of happiness. Furthermore, demographic characteristics of gender, race, and socioeconomic status were hypothesized to play a moderating role in the relationship between health promotion and happiness. Findings demonstrated that two health-promoting behaviors were significantly correlated with SWB in the current study. Increased amount of sleep per night was linked to higher SWB, while attitudes toward substance use were negatively correlated with youth's SWB. A significant percentage of the variance in SWB (15%) was accounted for by the linear combination of health-promoting behaviors, although only one of the five health promoting behaviors (i.e., attitudes toward substance use) was a unique predictor of SWB. In addition, none of the interaction terms of gender, race, and SES with health-promoting behaviors were

significant predictors of SWB, indicating that moderating effects were not found for this sample. Implications for further investigation of these findings include the use of other methods for reporting health-promoting behaviors in early adolescents as well as replication of moderating effects with a more ethnically diverse sample of youth. Findings call for integration of health promotion programming into school psychology practice from a prevention to targeted level of service delivery with youth.

CHAPTER 1 INTRODUCTION

Statement of the Problem

A majority of research on children and adolescents' mental and physical health focuses exclusively on forms of illness and psychopathology (Mullan Harris, Berkowitz King, & Gordon-Larsen, 2005; Park, 2004). Empirical investigations of mental health and functioning in youth primarily attend to internalizing (e.g., anxiety, depression) and externalizing disorders (e.g., aggressive behavior, conduct disorder; Achenbach, Dumenci, & Rescorla, 2001). Similarly, large-scale studies of physical functioning often examine children and adolescent's risky or compromising health behaviors (e.g., substance use, sedentary activities; Centers for Disease Control (CDC), 2007) or focus on acute and chronic physical illness (Brown, Boeving, LaRosa, & Carpenter, 2006; Leonard, Jang, Savik, & Plumbo, 2005). Such information can be very useful for understanding the current health status of samples of youth; however, a movement within both the psychology and health fields in the past decade has been to focus on positive indicators of functioning for children and health promoting behaviors (Anderson, Moore, & Lippman, 2005). Researchers who share this shift in thinking emphasize that an absence of illness (physical or mental) is not enough to assume that children are doing well. Rather, using a wellness and prevention framework, children who are doing well or *flourishing* are those who are satisfied with their lives and are healthy and strong across many life domains (Keyes, 2002).

The integration of positive as well as negative indicators of well-being into health assessment yields a more comprehensive picture of functioning. Furthermore, understanding how mental and physical wellness relate in a holistic manner allows professionals to examine the health and behavior of youth as a set of integrated factors rather than isolated pieces. Such data can be used to inform wellness programs and prevention strategies targeting children and adolescents who may be at-risk of developing future health problems – those who are not displaying symptoms of physical or mental illness, but who also report decreased life satisfaction, or happiness, and low amounts of health-promoting behaviors such as regular exercise and healthy diet. By examining these types of wellness components in youth, practitioners and researchers could better understand and address the health concerns of this population via a prevention model of service delivery. The current study investigated key factors that comprise both mental health and wellness (i.e., subjective well-being (SWB)), and physical wellness (i.e., health-promoting behaviors including diet, exercise, sleep hygiene, safety habits, and attitudes toward substance use).

Subjective Well-Being (SWB)

Subjective well-being (SWB) is the scientific term for happiness (Diener, Eunkook, & Lucas, 1999). SWB is comprised of three related but separate constructs: life satisfaction, positive affect, and negative affect (Diener, 2000). Life satisfaction includes both global and domain-specific cognitive appraisals of one's happiness (e.g., happiness with family life or school life). Affect entails fairly stable emotions and mood states. Positive affect includes frequent pleasant feelings and mood, including joy, elation, and delight, while negative affect refers to a consistent experiencing of bothersome or

disagreeable emotions such as sadness, stress, guilt, and anger (Diener & Seligman, 2002). An individual reporting high SWB would make a positive judgment of the overall quality of his or her life, and experience a greater degree of positive affect relative to negative affect. Diener (2000) has noted that often the terms life satisfaction and SWB are used interchangeably throughout the literature; however, SWB is the more comprehensive measure of well-being.

In acknowledging the importance of assessing SWB, various researchers have proposed comprehensive models of mental health incorporating these constructs. Roeser, Eccles, and Sameroff (2000) assert the need for promotion of positive social and emotional development in today's school systems. Additionally, Park (2004) has attested to the importance of subjective well-being, stating that "positive indicators such as life satisfaction should be included in any assessment battery to capture comprehensively what is meant by the psychological well-being of youth" (p. 27). However, to date, the few empirical studies examining the utility of including SWB in assessments of mental health have demonstrated that knowledge of a child's SWB more accurately predicts his or her social and educational functioning than psychopathology-based indicators alone (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008).

Health-Related Behaviors

Health-related behaviors, as conceptualized in this study, refer to daily habits and behaviors that individuals engage in that relate to physical functioning and long-term health outcomes. Health-related behaviors encompass both health-compromising or 'risky' behaviors as well as health-promoting or 'adaptive' behaviors (Levy, 2003; Mullan-Harris et al., 2005).

Health-compromising behaviors vary across age group and are more prevalent in studies with older adolescent or adult populations. Such behaviors may include risky habits in regard to safety, substance use, and sexual behavior. While these types of behaviors are more often assessed in empirical research than adaptive behaviors, outcomes of programs designed to decrease these negative behaviors show a limited long-term impact on health (Eaton, Kann, Kinchen et al., 2005). Thus, re-shifting a focus to health promotion versus risk reduction provides a more optimistic avenue for improving health outcomes in youth.

Health-promoting behaviors include actions individuals engage in that promote or maintain positive health (Kulbok & Cox, 2002). In youth, health habits that are most fundamental to development include exercise, a balanced diet, taking safety precautions, and getting adequate sleep (Mullan Harris et al, 2005; Stanton, Willis, & Balanda, 2000). Researchers who emphasize the need to attend to and promote healthy habits among youth assert that this period in life, particularly in early adolescence, is often when individuals begin to formulate their own habits for the first time and continue these habits into adulthood (Danner, 2000). The current study examined a sample of early adolescents (i.e., 6th to 8th grade), which is typically a time in the developmental progression when youth are granted more autonomy with their decision-making regarding many health habits such as length of sleep per night, diet options, and physical activity choices (Mullan Harris et al.).

Purpose of the Current Study

In both the fields of psychology and public health, there has been a growing movement toward examination of positive psychology constructs and toward health

psychology and holistic health research (Anderson et al., 2005; Diener, 2000). While the importance of attending to holistic health and wellness promotion has been highlighted, a dearth of literature still exists within this area of research for both adult and child/adolescent populations. Although one study has examined these relationships with adults (Levy, 2003), three studies with youth have been conducted to date (Holder, Coleman, & Sehn, 2009; Lindberg & Swwnberg, 2006; Piko, 2006) and are limited in scope and/or the lack of validated measures of these constructs. Two of these studies were also conducted outside of the United States. Thus, the current study was primarily exploratory in nature. Results of this current study may be used to inform and develop comprehensive wellness promotion programs for American youth.

Several studies also demonstrate significant demographic differences in regard to health-related behaviors among youth (CDC, 2007; Spear & Kulbok, 2001). The current study examined how gender, ethnicity, and socioeconomic status (SES) influenced the relationship between SWB and health-promoting behaviors. This information may be used for tailoring wellness programs that are relevant across diverse groups of adolescents.

In sum, the following research questions were addressed in the current study:

1. What is the strength and direction of the relationship between specific health-promoting behaviors employed by early adolescents and their subjective well-being?
 - a. Dietary habits
 - b. Physical activity
 - c. Safety habits
 - d. Sleep hygiene
 - e. Attitudes toward substance use

2. Which of the above health-promoting behaviors are most strongly related to the subjective well-being of early adolescents?
3. Are the relationships between early adolescents' health-promoting behaviors (i.e., dietary habits, physical activity, safety habits, sleep hygiene, and attitudes toward substance use) and subjective well-being moderated by gender?
4. Are the relationships between early adolescents' health-promoting behaviors (i.e., dietary habits, physical activity, safety habits, sleep hygiene, and attitudes toward substance use) and subjective well-being moderated by ethnicity?
5. Are the relationships between early adolescents' health-promoting behaviors (i.e., dietary habits, physical activity, safety habits, sleep hygiene, and attitudes toward substance use) and subjective well-being moderated by SES?

Hypotheses

The next chapter reviews the limited literature base on relationships between mind and body wellness among youth. Of the three studies specifically examining health-promoting behaviors and SWB in youth, findings indicate significant, positive relationships between these variables (Holder et al., 2009; Lindberg & Swanberg, 2006; Piko, 2006). For instance, Lindberg and Swanberg found that among a sample of international youth, eating habits were a significant predictor of students' well-being. Research with adult populations has demonstrated similar results (Levy, 2003; Rejeski, Shelton, Miller, Dunn, King, & Sallis). Thus, it was hypothesized that each of the five

health-related behaviors assessed in the current study would have significant, positive correlations with the SWB of early adolescents, in that youth who reported higher levels of engagement in these healthy behaviors also would report higher levels of happiness. Previous studies have only included one or two aspects of health-promoting behavior in their research design, with the greatest focus on diet and exercise (Holder et al., 2009; Klein-Hessling, Lohaus, & Ball, 2005; Piko, 2006). The existing literature base suggests that these two health behaviors may be most strongly related to SWB; however, the current study is the first to specifically examine which health-promoting behaviors correlate most strongly with SWB in one sample of youth.

Numerous studies have highlighted differences between gender, ethnic group, and SES in regard to health-related behaviors (Pate, Trost, Levin, & Dowda, 2000; Spear & Kulbok, 2001; Wu, Rose, & Bancroft, 2006). It was hypothesized that these demographic differences also would serve as moderators in the health behavior/SWB relationship. Specifically, the behaviors that relate most strongly to SWB for males would likely differ for females, based on factors such as societal norms and expectations for different demographic groups. Across a review of several studies with youth, mean differences in nutrition, safety habits, and physical activity were found between males and females (Spear & Kulbok). Thus, gender was hypothesized to moderate the effects that these three behaviors have on SWB. Ethnic differences in type and vigor of physical activity have been demonstrated via research with the Youth Risk Behavior Surveillance System (YRBSS; CDC, 2007). Findings across ethnic groups for diet and substance use have been inconsistent. A hypothesis was developed that ethnicity would moderate the effects of physical activity on youth's SWB. Finally, SES has the most documented

empirical link with dietary intake of youth, and therefore, it was also hypothesized that SES would moderate the relationship between dietary intake and SWB.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter provides a review of current research examining mental and physical well-being among youth. Specifically, a rationale for examining positive indicators of functioning, versus a traditional focus on absence of illness or problems is discussed. First, a review of mental health as it has evolved from traditional roots to a broader, more contemporary conceptualization of mental health that includes assessment of both positive and negative indicators of functioning is provided. One specific positive indicator of mental health, subjective well-being, is discussed. An ecological perspective purports that mental health and functioning cannot exist in isolation, rather, various factors are associated with an individual's well-being.

The importance of one understudied correlate in particular, physical health, is highlighted as a focus of the current study. A review of physical health indicators in youth is examined. Current research has established significant links between physical health and mental well-being (i.e., SWB) among children and adolescents. While these studies have highlighted important empirical links, no research has yet focused on the potential benefits of boosting mental well-being via physical health promotion agendas. In other words, do youth who complete intentional activities to improve their physical functioning (i.e., health promoting behaviors) also experience higher levels of mental wellness than their peers who may not exhibit these same health promoting behaviors?

Previous research has demonstrated demographic differences in health-related behavior, including dietary habits and physical activity, among youth (Manly, 2006; Spear & Kulbok, 2001). Thus, the contribution of three demographic factors, gender, ethnicity, and SES, to the mental-physical well-being relationship among youth is also discussed. This chapter concludes by reviewing how such empirical knowledge would provide a foundation for building comprehensive health promotion programs for youth, addressing both physical and mental well-being.

Positive Indicators of Mental Health

According to Jahoda (1958), “the absence of disease may constitute a necessary, but not sufficient, criterion for mental health” (p.15). In other words, a traditional (i.e. pathology focused) model of mental health provides limited information pertaining to individuals’ true well-being. A focus exclusively on pathology limits the range of services mental health professionals can provide to individuals by only addressing issues of mental illness instead of striving for optimal development.

Over the past few decades, a growing interest has developed in healthy development or wellness. This topic is of particular importance during the critical adolescent years when emotional and social development is vastly expanding. Compared to the substantial body of literature on indicators of psychopathology, little research has examined happiness, or other positive indicators of well-being. Diener (2000) described the interest in positive indicators as part of the positive psychology movement and essentially a paradigm shift within the mental health field. The traditional model of wellness places mental health/happiness on a continuum with psychopathology (PTH), each being at opposite ends. Yet, Diener, Lucas, and Oishi (2002) asserted that the

absence of disease is not an adequate criterion to describe a person as mentally healthy, and particularly not as possessing high or even average levels of happiness or optimal adjustment. Therefore, in contrast to a one-dimensional view of mental health, a more encompassing view would define PTH and mental health as separate yet interrelated constructs (Wilkinson & Walford, 1998). By recognizing that happiness and well-being do in fact exist separately from disease, the field of positive psychology emphasizes prevention and optimal functioning rather than solely focusing on the treatment of problems that manifest. Adopting an expanded model of mental health allows practitioners to recognize and work with more diverse groups of individuals.

More contemporary conceptualizations of mental health strive to define it not only as the absence of negative indicators of adjustment but also as the presence of positive development. Positive indicators of mental health include variables such as life satisfaction, locus of control over circumstances, hope, self-efficacy, and other factors related to one's mental wellness (Lopez & Snyder, 2003). Among the central tenants of these positive indicators of mental health is the measure of subjective well-being (SWB), also referred to as happiness.

Subjective Well-Being – Definition and Measurement

The present study will examine one important indicator of positive psychological well-being known as subjective well-being (SWB). In order to appreciate the need for a measure of SWB when assessing mental health in children and adults, it is important to first understand what SWB encompasses and how it has advanced to its current conceptualization. The notion of optimal functioning, including that of SWB, has evolved fairly recently in the field of psychology (i.e., the past thirty years). Diener and

colleagues (1999) described how SWB differs from objective measures of a ‘good life,’ such as number of friends or salary, in that every person essentially has the right to decide whether his or her life is valuable and filled with a degree of happiness. SWB, then, refers to an individual’s evaluation of his or her life in all domains, and more specifically, ‘people’s cognitive and affective evaluations’ (Diener, 2000). SWB moves beyond the basic fulfillment of needs to a desire for optimal functioning and one’s own evaluations about how close they are to optimal functioning. Diener (2000) asserts that happiness and life satisfaction are considered important in all societies but to a greater extent in westernized cultures, where more focus is placed on individuals rather than on society as a whole. While collectivistic societies typically focus on how each person contributes to a larger group or society, individualistic societies emphasize each person’s own level of happiness and how satisfied they are with their current life circumstances.

SWB is comprised of three related, but separable constructs: life satisfaction, positive affect and minimal levels of negative affect (Diener, 2000). Life satisfaction includes both global and domain-specific cognitive appraisals of one’s happiness. Global life satisfaction pertains to an individual’s *overall* assessment of personal happiness (e.g., ‘I am happy with my life’), while domain-specific life satisfaction has been measured as subjective happiness across both inner (e.g., self) and outer-directed domains (i.e., school, friends, family, and environment). A strong relationship between global and domain-specific life satisfaction has been supported through previous factor-analytic procedures (Huebner, Gilman, & Laughlin, 1999). Affect entails emotions and mood states, in that positive affect includes frequent pleasant feelings and mood, including joy, elation, and delight, while negative affect refers to a consistent experiencing of bothersome or

disagreeable emotions such as sadness, stress, guilt, and anger (Laurent et al., 1999). Diener and Seligman (2002) have demonstrated that very happy people experience a greater frequency of positive versus negative affect. These three factors (life satisfaction, positive affect, low negative affect) have long been defined in the literature as components of SWB, but much of the early research on SWB of children focused solely on global life satisfaction. Given that the positive and negative affect domains of SWB represent emotion and mood, factors susceptible to frequent shifts and changes within an individual, life satisfaction is considered to be the more stable component of SWB measurement. Thus, many assessments of children's SWB to date have exclusively included global and/or domain-specific measures of life satisfaction. However, it is quite possible that a child may be satisfied with his or her life on the whole, but experience a high frequency of negative emotions surrounding a temporary life circumstance. Therefore, knowing information pertaining to all three identified components assists in forming a more comprehensive picture of a person's true SWB (Diener et al., 2002).

The examination of SWB among children and adolescents is very limited compared to the number of studies conducted with adult populations. Although the concept of life satisfaction has not been discussed to a substantial extent in the developmental literature, the construct of "happiness" has been identified as one indicator for positive mental health (Huebner, 1994; Huebner, Suldo, & Valois, 2005). Huebner (1994) proposed that the limited research on happiness in youth may be due to the lack of sound measurement of SWB for children. For instance, several early studies assessed SWB using a one-item indicator such as "I am happy with my life." Students then rated their level of agreement with the statement on a likert-type scale. For instance, Natvig,

Albreksten, and Qvarnstrom (2003) assessed adolescents' life satisfaction by asking "In general, how do you feel with your life at present?". Leung and Leung (1992) also assessed global life satisfaction among Chinese students using a one-item indicator ("How do you feel about your life as a whole?"). Although life satisfaction as a one-item indicator or questionnaire may be the most frequent assessment of SWB among youth as well as adults, more comprehensive measures of happiness have also been used. Specifically, the Multidimensional Students' Life Satisfaction Scale (MSLSS: Huebner, 1994) was developed to measure children's and adolescents' life satisfaction within specific life domains (e.g., friends, family, school) and also provides a composite of overall life satisfaction. The Students' Life Satisfaction Scale (SLSS: Huebner, 1991), a predecessor to the MSLSS, taps children's global life satisfaction judgments with a seven-item questionnaire.

Diener (2000) stated that thorough measures of happiness include assessments that tap each of the three theorized components of SWB. For example, an affect scale measuring both positive and negative emotions or feelings may be included as well as a scale to measure global life satisfaction and satisfaction in certain domains such as work, family, and social relationships. The Positive and Negative Affect Schedule (PANAS: Watson, Clark, & Tellegen, 1988) was developed as a brief measurement of positive and negative affect for use with adult populations and has been used in subsequent measurements of SWB throughout the past decade (Kercher, 1992). This scale assesses the degree to which individuals experience positive and negative affect in daily life using emotion descriptions such as 'mad,' 'delighted,' and 'gloomy.' A similar scale, the Positive and Negative Affect Scale for Children (PANAS-C: Laurent et al., 1999), was

developed for use with children and adolescents, with minor modifications of items to adjust for readability and comprehension, including removal of abstract words such as 'hostile' and addition of concrete descriptors such as 'happy' and 'calm'.

Other researchers have employed innovative techniques to assess the truest sense of SWB possible. Positive and negative affect have been measured at random times over a span of several weeks as a more naturalistic method of assessing individual's true feelings (Kardum & Daskijevic, 2001). Also, longitudinal research has found SWB to be fairly stable across time for various age groups, while also sensitive to changing life circumstances. Among a sample of over 800 high school students, self-reports of life satisfaction demonstrated moderate stability ($r = .56$) over a one-year period (Suldo & Huebner, 2004). Research with a sample of retired adults shows high stability ($r = .73$) of the more comprehensive construct of happiness, SWB, over a nine-month period (Lepper, 1998).

One area of concern in regard to measurement of SWB is subjectivity to forms of bias because it is, in fact, a completely *subjective* measure. An individual's concurrent emotional state as well as situational factors at the time of assessment may influence responses. Eid and Diener (2004) investigated the long-term stability of SWB in relation to personality assessment (e.g., extraversion, neuroticism) and temporary mood ratings among 249 young adults, ages 17-21, across three different measurement times. Findings from this research support the stability of global SWB, as minimal changes in SWB were reported across a 12-week period, and changes were much smaller than participants' variability in mood states. Another potential concern with measurement of SWB is that, like many other self-report scales, individuals may provide socially desirable responses

rather than true reflections of their judgments and feelings. Rather than indicating disappointment with friendships, for example, a respondent may state that they feel fulfilled with their social relationships in order to provide what they consider a more socially desirable response. However, Huebner (1991) found that adolescents' reports of life satisfaction had only a .05 correlation with a measure of social desirability. In addition, reports of a person's life satisfaction have been shown to be fairly consistent with reports from significant others in that person's life (Lepper, 1998), providing evidence that SWB is often reported without social bias, as well as demonstrating that SWB can be manifested in overt ways so that others are aware of a person's inner feelings and evaluations.

Research on the construct of SWB has recently shifted from looking at which *groups* of people tend to be happy (such as married people or people who attend church regularly) to more of a focus on what it takes to be happy. Research shows that individuals from many varying backgrounds and circumstances may report adequate or high SWB, and that, to a certain extent, happiness is not tied to specific status or condition (Diener, 2000). A person's values and aspirations, upbringing, and contribution to a greater community or society all play a role in life satisfaction, and obtaining information on these factors is important in understanding SWB (Diener, Eunkook, & Lucas, 1999).

Importance of Assessing SWB in Children

Examinations of the influence of high vs. low SWB in one's everyday life have demonstrated correlations between happiness and various positive personal circumstances. For instance, Lyubomirsky and colleagues found that happiness does

indeed provide benefits at the individual, family, and community level (Lyubomirsky, King, & Diener, 2005). Meta-analyses of longitudinal data revealed that, in general, happier people gained benefits such as a more positive state of mind, social advantages such as a higher likelihood of marriage and more friends, greater work productivity and higher income, as well as increased energy and activity. Of note, results showed that happiness *preceded* as well as paralleled many of these successful outcomes. In other words, individuals were not simply happier as a result of better life circumstance, but rather, their frequency of positive affect played a role in future desirable outcomes and successes. However, other confounding variables contributing to positive life outcomes beyond happiness could not be controlled for in these analyses; therefore, a definitive conclusion of these relationships cannot be determined.

Understanding SWB in youth is also important for helping children to reach greater levels of life satisfaction, which in turn can also help prevent future problems from manifesting as well (Suldo & Huebner, 2004a). In other words, attending to SWB also serves a preventative role in mental health promotion rather than a traditional treatment function. A growing body of research supports the various functions that life satisfaction may play as a protective factor against psychopathology, as well as fostering a greater productivity level in society and more positive relationships with others. In support of the protective role that SWB may play, low life satisfaction has been shown to precede depression onset in the adult years in a sample of over 2,000 participants (Lewinsohn, Redner, & Seeley, 1991). Additionally, Frisch (1999) found low life satisfaction to predict factors such as suicidal behavior and physical health.

To demonstrate the importance of examining SWB separately from the absence of psychopathology, recent researchers have highlighted differences in outcomes among youth with similar levels of psychopathology but different levels of SWB (Suldo & Shaffer, 2008). A sample of 349 middle school students completed self-report measures of both SWB, measured via the MSLSS (Huebner, 1994) and PANAS-C (Laurent, Catanzaro, Joiner, et al., 1999), and psychopathology, measured via the Youth Self-Report Form of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001). Teachers also completed the Teacher Report Form of the CBCL (Achenbach & Rescorla, 2001) to assess levels of externalizing psychopathology among each participant. These mental health assessments were used to categorize students into various mental health groups, and then compare their educational, social, and physical functioning, measured via both self-report and objective data such as school records. Results demonstrated the importance of SWB as a significant correlate of all three areas of functioning, separate from that of psychopathology. Specifically, between two groups of youth both reporting low levels of psychopathology, those with average to high SWB reported significantly better educational, social, and physical health outcomes than youth with low SWB. Even among the other youth reporting some symptoms of psychopathology, those with higher SWB reported better functioning across all three domains assessed. A follow-up analysis by this same group of researchers demonstrated that the SWB construct of positive affect explained the most unique variance in physical health of youth ($\beta = .25$), when compared to both internalizing and externalizing psychopathology (Shaffer-Hudkins, Suldo, March, & Loker, 2010).

Collectively, these results substantiate the importance of attending to SWB as a separate mental health construct in youth by demonstrating its significant links to educational, social, and physical functioning. Although all of these outcomes (i.e., academic performance, social relationships, and physical health) have an important link to children's mental health, based on the focus of the current study, the relationship between mental and physical well-being will be examined in more detail below.

Physical Functioning as a Correlate of SWB

Research with Youth

The literature base addressing SWB and related physical health characteristics is very limited. Of the existing manuscripts examining this relationship, many focus on the subjective quality of life of those living with a form of chronic illness. For instance, SWB measurement as related to long-term illness in working with children with chronic asthma has been considered (Bray, Kehle, Peck, Theodore, & Zhou, 2004). The authors proposed a theory to explain the reduction of emotionally triggered asthma through positive psychology treatments. The central tenant of this theoretical model was that enhanced SWB in turn will promote decreased levels of anxiety, thus lowering sympathetic and parasympathetic branches of the autonomic nervous system that affect lung function. This model is based on the underpinnings of interactions between the central nervous system, psychological factors, and ultimately, the immune system and physical health. Children suffering from asthma would potentially cope with the anxiety associated with an asthmatic attack or exacerbations more efficiently when they have a high emotional well-being. Therefore, interventions targeted at increasing subjective well-being of these patients are recommended. Unfortunately, there is a dearth of such

interventions with empirical support. Previous research supports the use of psychologically based interventions such as guided imagery to improve lung functioning of patients with asthma (Peck, 2001). Empirical research that examines the effectiveness of SWB enhancing treatments in improving asthma symptoms is needed. In addition, research should also test the association between SWB enhancement and other health outcomes.

One empirical study of children living with a chronic illness relative to SWB examined 127 patients with asthma and spinal cord injuries (Hampton, 2004). Specifically, researchers explored the contributions of perceived health, self-efficacy beliefs, and perceived social support to SWB among over one hundred individuals with spinal cord injuries. SWB was assessed using the Index of Psychological Well-Being (IPWB; Berkman, 1971), an eight item indicator of well-being. Frequency of negative and positive affect or feelings were combined to form a composite SWB score. Of note, low scores on the IPWB reflect higher levels of SWB. Results indicated that perceived health, as measured by the Self-Rated Health Status Scale (SRHSS; Lawton, Moss, Fucomer, & Kleban, 1982), was moderately significantly correlated with SWB ($r = -.42$) and was among four correlates to predict a substantial portion of variance in SWB among these patients, along with age at which injury occurred, self-efficacy and perceived social support. Since a control group of healthy children was not included in this study, it is not known whether these findings are specific to children with chronic illnesses.

While existing research addressing chronic illness and SWB is extremely limited, two research teams have examined the relationship between life satisfaction and everyday physical functioning and symptoms within healthy children and adolescents. Zullig,

Valois, Huebner, and Drane (2005) explored the relationship between life satisfaction and health-related quality of life among a state-wide sample of nearly 5,000 adolescents ages 13 to 18 years. Participants completed the BMSLSS and the Health-Related Quality of Life (HRQOL), a four-item scale developed by the Centers for Disease Control and Prevention that assesses self-rated health, number of poor physical and mental health days, and activity limitation days due to poor physical or mental health. Results indicated that life satisfaction was significantly negatively correlated with greater numbers of poor physical health ($r = -.15$) and activity limitation days ($r = -.27$). Additionally, ratings of self-rated health were inversely associated with reduced life satisfaction ($r = -.21$). A similar moderate relationship between physical health and life satisfaction was also identified in a large sample of international youth. Among 941 Kuwaiti adolescents, physical health perception (measured via a one-item self-report item about how healthy one feels) was positively correlated ($r = .28$) with a one-item life satisfaction item (Baroun, 2006).

This research provides preliminary support for a relationship between life satisfaction and physical health and functioning. However, the research in this domain is still extremely narrow. In fact, only two studies to date examined SWB (including measures of both life satisfaction and positive and negative affect) as a function of physical health among youth (Hexdall & Huebner, 2007; Suldo & Shaffer, 2008). Specifically, Hexdall and Huebner examined 29 pediatric oncology patients ages 11-21 across several dimensions including life satisfaction, hope, and affect. Contrary to hypotheses, patients' life satisfaction (as measured by the MSLSS and SLSS) and positive and negative affect levels (as measured by the PANAS-C) were comparable to

that of 29 healthy children of similar ages, matched on age and gender. These findings are consistent with previous literature indicating that levels of SWB are fairly stable across time, although temporary fluctuations in response to life events may occur (Headey & Wearing, 1989). Patients included in this study had received a diagnosis of their illness (a form of leukemia or lymphoma) at a mean of 38 months prior to participating, and therefore any decreased impact on SWB may have stabilized at the time data were collected. On the other hand, relatively small sample sizes may have reduced power to detect significant group differences in SWB. An additional investigation using a larger sample of patients is necessary in order to draw more definitive conclusions.

Overall, examinations of SWB related to physical health conducted to date yield inconsistent findings regarding the relationship between these variables, and brief measures have been used in some cases. Two studies utilizing relatively large sample sizes established significant correlations between life satisfaction related to everyday physical functioning (Baron, 2006; Zullig et al., 2005); however, a more comprehensive measure of positive functioning such as SWB related to physical functioning is needed, utilizing validated measures. In addition, an extension of Hexdall and Huebner's research (2007) with a larger sample may better determine the SWB of children suffering from various chronic illnesses and conditions. Demographic and environmental influences (e.g., age, gender, parenting style) impacting the relationship between physical and mental well-being among youth must also be examined.

While only a few empirical investigations have addressed the relationship between SWB and physical health among youth, a larger body of literature has

documented a relationship between physical health and SWB in *adults*. A review of seminal work with adult populations is provided below.

Research with Adults

Although the research base on SWB as related to physical health in children is extremely limited, this relationship has been examined more extensively among adult populations. Examining adult findings provides a more comprehensive picture of these constructs. In a population of over 3,000 individuals ages 25 to 74 years, Keyes (2005) found that ‘completely mentally healthy’ adults, as measured by both positive and negative indicators of well-being (using the Composite International Diagnostic Interview Short Form (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998), reported the fewest health limitations in daily living activities as well as the fewest missed days of work, as compared to adults classified in other groups of mental health and illness. Positive constructs of mental health were measured using various self-report questionnaires of positive affect and psychological social well-being. Validity and reliability of these measures has been demonstrated in previous research (Keyes, 1998; Ryff, 1989). Health limitations in daily life was operationalized as whether physical health limited oneself to any degree (e.g., ‘a lot’ to ‘not at all’) in nine daily activities, including climbing stairs, bending at the knees, walking more than one mile, and lifting heavy objects. These results confirm the notion that mental health is related to physical health and subsequent physical performance in everyday life. However, demographic group differences were not assessed in this research; therefore, the extent to which gender, race, or other variables may impact these findings has yet to be determined.

An examination of predictors of life satisfaction in 72 college students found physical health to be a significant correlate (Pilcher, 1998). The SWLS was used to measure global life satisfaction; these reports were compared with students' ratings of physical health, assessed using the Cornell Medical Index (CMI; Brodman, Erdmann, Wolff, & Miskovitz, 1986), as well as an index of sleep quality. The CMI contains items representing different types of health complaints and frequency of illness (e.g., 'do you frequently find it hard to breathe?', 'do you suffer from frequent headaches?'). Life satisfaction was inversely related to physical health complaints ($r = -.30$) and frequency of illness ($r = -.36$). Life satisfaction, therefore, was influenced to some degree by students' physical health and functioning.

The relationship between physical health and SWB among adult populations has also been demonstrated in large scale studies, both at a national level and longitudinally. The National Survey of Mental Health and Well-being in Australia, sampling over 10,000 individuals, showed that well-being, as measured by a one-item indicator (i.e., 'How do you feel about your life as a whole, taking into account what has happened in the last year and what you expect to happen in the future?'), was consistently higher in those with good overall physical health, assessed using the General Health Questionnaire (GHQ-12; Goldberg, 1978). Findings also indicated that well-being was lower in persons with physical disorders or disablement due to physical illness or injury (Dear, Henderson, & Korten, 2002).

A longitudinal, national study in the United States illustrated the relationship between life satisfaction and physical health (Mroczek & Spiro, 2005). Across 22 years, the Veterans Affairs Normative Aging Study founded at the Boston VA Outpatient

Clinic, assessed life satisfaction, measured via the Life Satisfaction Inventory-Form A (LSI-A; Neugarten, Havinghurst, & Tobin, 1961), and physical health (measured via a one-item indicator of overall physical health) among other constructs in nearly 2,000 men who were considered normatively healthy. Higher physical health ratings were associated with higher levels of life satisfaction. Moreover, this relationship was not altered according to changes over time; at all ages, participants who rated their physical health better also reported more satisfaction with their lives.

Research with adults over the past decade has shown consistent, positive relationships between physical health and happiness. Specifically, higher levels of life satisfaction have been associated with specific indicators of physical health (i.e., fewer number of daily health limitations) and perceptions of overall good health. These findings have also been shown across various populations (i.e., a small sample of college students, national representative samples of adults, and male veterans). However, with the exception of Keyes' research (2005), the majority of these studies utilized only one measure of mental health (i.e., life satisfaction). Further examinations of physical health as related to multiple measures of SWB as well as a measure of psychopathology would establish how physical health relates to positive and negative domains of functioning.

In each of the empirical studies of physical health and SWB listed above, the concept of *physical health* is defined or operationalized differently. An important next step in the research of physical and mental wellness in youth is to examine what constructs of physical health have been examined to date. One key distinction to make across these studies is that physical functioning can be viewed from either a wellness or illness perspective, similar to the delineation in the mental health field of

psychopathology and well-being (Diener, 1999; Wilkinson & Walford, 1998). Thus, several different constructs of physical functioning arise, and are described below.

Constructs that Comprise Physical Health among Youth

Acute and Chronic Illness

In many empirical investigations of physical health, a focus is placed on the measurement of acute or chronic illness in clinical samples, ranging from oncology to asthma, diabetes, and many other diseases. A large literature base exists to examine relationships between these physical illnesses and various psychosocial factors. Both Hexdall and Huebner (2007) and Hampton (2004), reviewed earlier in this chapter, studied the psychological impact of chronic illness among samples of youth, focusing specifically on childhood cancer, asthma, and spinal cord injuries. Unlike other assessments of physical health that may rely solely on rating scales or other self-assessments, the study of chronic and acute illness is often operationalized as a positive diagnosis given to a participant by a medical professional.

Daily Physical Functioning

A different way in which physical health may be operationalized is by examining daily physical functioning. Several published rating scales, including the Child Health Questionnaire (CHQ; Landgraf et al., 1999) and the Child Health and Illness Profile – Child Edition (CHIP-CE; Riley, Roberston, Forrest et al., 2001), include items to assess daily physical functioning. For instance, the CHQ examines one’s general health perceptions, as well as the number of days in which activity is limited due to poor physical health. Thus, in contrast to assessing whether or not a patient has a diagnosed acute or chronic illness that impairs physical health, this type of assessment is more

readily used in general or nonclinical samples. While this type of physical health assessment provides global judgments and ratings about one's overall health, it does not provide information on the specific activities individuals engage in that are directly tied to their physical health. Thus, assessment of health-related behaviors is another important aspect to assessing physical health.

Health-Related Behaviors

Many of the daily behaviors that one engages in are directly related to everyday physical functioning as well as long-term physical and mental health outcomes. Within the literature base on health-related behaviors, both a positive and negative focus to behavior has been taken. Specifically, researchers have examined *health-compromising* as well as *health-promoting* behaviors in relation to mental health outcomes among adults and adolescents (Levy, 2003; MacDonald, Piquero, Valois, & Zullig, 2005; Youngblade & Curry, 2006). Many health-related behaviors can be interpreted in opposite ways as either health-promoting or health-compromising (e.g., diet that consists of nutritious foods would be health-promoting while diet that consists of fatty foods would be considered health-compromising). The current literature base provides some guidance on how various behaviors are consistently operationalized and categorized as either adaptive or maladaptive.

Health-compromising behaviors vary across age group and are often a focus in studies with older adolescent or adult populations. These behaviors include alcohol and substance use, risky sexual behavior, and reckless driving. The Youth Risk Behavior Surveillance Survey (YRBSS; Centers of Disease Control and Prevention, 2007) is one of the most well-known and widely distributed measures of health-compromising behaviors

among youth in grades 9-12 in the United States. The purpose of the YRBSS is to monitor the prevalence of six high-risk behaviors among youth that contribute to leading causes of morbidity and mortality. These behaviors include: 1) tobacco use, 2) alcohol and other drug use, 3) risky sexual behaviors, 4) unhealthy dietary behaviors, 5) physical inactivity, and 6) behaviors that contribute to unintentional injuries and violence. Statistics from the YRBSS show that half of all adolescents participate in one or more high-risk behaviors (Centers for Disease Control and Prevention, 2007). The YRBSS includes a national school-based survey as well as state and local surveys that are then summarized to provide the most current prevalence rates and inform policies and programs to improve adolescent health and life span (Eaton, Kann, Kinchen et al., 2005). Many empirical studies examining health-compromising behaviors among youth include similar constructs to the YRBSS, and link these outcomes to factors such as mental health (MacDonald, Piquero, Valois, & Zullig, 2005) and various psychosocial variables (DiClemente, Wingwood, Crosby et al., 2001; LaGreca, Prinstein, & Fetter, 2001). Results of programs meant to decrease one or more health-compromising behaviors based on YRBSS and other research of risky behavior in youth are often minimally effective or impact only short-term results (Eaton et al.). Thus, re-shifting a focus to health promotion versus risk reduction may provide a more optimistic avenue for improving outcomes in youth.

Health-promoting behaviors include *adaptive* behaviors that children and adolescents exhibit in an effort to improve or maintain positive health (Kulbok & Cox, 2002). Due to the focus on positive outcomes in the current study, assessment of health-promoting behaviors will be reviewed more extensively. Health-promoting behaviors

can be viewed quite comprehensively, and include activities such as regular exercise, a balanced diet, taking safety precautions, and getting adequate sleep, among others (Kohl, Fulton, & Caspersen, 2000; Murphey et al., 2004; Stanton, Willis, & Balanda, 2000). While health-compromising behaviors have been studied much more frequently, growing attention toward health promotion has occurred in studies of adolescent health in recent years. Researchers who emphasize the need to attend to and promote healthy habits among youth assert that this period in life is often when individuals begin to formulate their own habits for the first time and continue these habits into adulthood. Thus, a focus on promoting healthy habits is important. Further attention toward health promotion, particularly in regard to eating and activity habits, has also occurred in an effort to combat obesity among youth, which affects nearly a quarter of youth in the U.S. (Harris, King, & Gordon-Larsen, 2005; USDHHS, 1999). Although several factors highlight the need for attention toward healthy behaviors among youth, methods for assessing these behaviors are still being determined and vary a great deal across studies.

Previous research demonstrates that health-promoting behavior is difficult to fully understand without also examining the cognitive and social factors that contribute to engaging in these activities. In other words, what factors contribute to a person engaging in a healthy lifestyle? To better understand the construct of health-promoting behaviors, Pender, Murdaugh, and Parson (2005) began development of a health promotion model in the 1980s for nursing practice; this model outlines the multidimensional nature of behaviors that comprise health promotion, also termed *disease prevention*, ranging from physical activity and diet/nutrition to stress management and social support. Pender and colleagues' model is intended to present a theoretical perspective of factors that both

contribute to and comprise a healthy lifestyle. Contributing factors to healthy behaviors include self-efficacy, or the belief in one's abilities to engage in health-promoting activities, as well the social supports to do so. The model was developed for a wide array of age ranges, and is not particularly sensitive to child and adolescent populations. Since its initial development, only a few studies (Garcia, Norton Brota, Frenn et al., 1995; 1998; Srof & Velsor-Friedrich, 2006; Wu & Pender, 2002) have specifically examined application of this health promotion model to adolescent populations. For instance, Garcia and colleagues (1995) applied the influence of physical activity beliefs and actual exercise behavior among fifth through eighth grade students. Regression analyses demonstrated that self-efficacy for exercising and beliefs about the important of exercise accounted for approximately 19% of the variance in physical activity behaviors. While these beliefs appear to be significant contributors to health-promoting behavior, these results infer that other, possibly unexplored factors, also play a role. Results of this study also showed significant gender differences in both physical activity beliefs and behaviors, highlighting the need to attend to demographic variables when conceptualizing healthy behaviors. The influence of demographics is discussed later in this chapter.

Measurement of Health-Promoting Behaviors

Dimensions of Health-Related Behaviors in Adolescence

To more clearly define dimensions of adolescent healthy and unhealthy behavior, researchers conducted principal components analyses using the Youth Risk Behavior Survey (YRBS), a national household-based survey that is part of the YRBSS system, described above (Kulbok & Cox, 2002). Responses to the YRBS were derived from a national sample of 8,730 youth, ages 14-17 years old. Kulbok and colleagues derived 41

items from the behavioral portion of this survey, and determined *a priori* whether each behavior had a positive or negative valence (i.e., *healthy* or *unhealthy*). Any behavior or action taken by an adolescent to promote well-being was considered *healthy*. Behaviors analyzed pertained to safety, substance use, diet, exercise, and sexual activity. Factor analysis revealed that 18 of the initial 41 items included in the survey had factor loadings of .50 or greater and explained 74% of the total variance and included four factors: sexual activity, alcohol and other drug use, smoking, and exercise. This factor structure remained constant across age, gender, and race groups. Interfactor correlations of the three factors with a negative valence (i.e., unhealthy behaviors) were high ($r = .48 - .50$), whereas the correlations of exercise (i.e., a healthy behavior) with the other three factors were lower, although still significant ($r = -.09 - -.06$). In terms of implications for measurement, Kulbok and Cox suggest that there are in fact meaningful dimensions of health-related behavior, falling along a continuum of healthy to unhealthy.

In a review of 34 studies published between 1984 and 1994 that examined health-related behavior in adolescent samples, Spear and Kulbok (2001) found that the most commonly studied health behaviors were nutrition, exercise, hygiene practices, sleeping patterns, alcohol, drug, and tobacco use, sexual and contraceptive behavior, and seat belt use. The majority of studies focused on one health-related behavior or a cluster of related behaviors such as diet and exercise. Across these studies, use of researcher-developed items to assess behaviors was most prevalent; few studies included a previously validated scale. To better operationalize healthy living and maintain consistency across studies, researchers have recently begun to focus on development of valid and reliable research measures of health-promoting behaviors among youth.

One example of research efforts toward these reliable measures is the Adolescent Health Promotion Scale (AHP; Chen, Wang, Yang et al., 2003), which was developed out of a theoretical framework developed by Pender (1992), in line with the health promotion model for nursing practice. This scale is based on a broad conceptualization of what behaviors account for a healthy lifestyle, and as such, not all items pertain directly to behaviors intended to increase physical health. This assessment includes 40 items that assess six dimensions of healthy behavior: nutrition, social support, life appreciation, health responsibility, stress management, and exercise behavior. Respondents indicated the frequency of all 40 behaviors on a Likert scale of 1 (*never*) to 5 (*always*). The AHP has been evaluated for content validity by an expert panel of medical and psychological professionals. Fairly high internal consistency has been reported for the scale, ranging from .75 to .93 (Chen, et al., 2003). The AHP has been used cross-culturally and was used in a recent study by Chen, James, and Wang (2007) with samples of nearly 600 adolescents from both America and Taiwan, to determine cultural demographic differences in these behaviors.

In working to develop another instrument of health-related behaviors in youth, Australian researchers assessed these behaviors in three phases: examining existing surveys used with adult and adolescent populations, consulting with health professionals on what constitutes a ‘healthy’ behavior, and conducting focus groups with adolescents to gauge some of their current behaviors (Stanton, Willis, & Balanda, 2000). This team of researchers was interested in gathering information on current behaviors of Australian youth in order to determine a plan of action for meeting health goals and priorities outlined for this population by various health organizations. The result of the project was

the development of a 143-item instrument, appropriate for use with high school students, which includes the following domains of both risky and adaptive behavior: alcohol and substance use, sun exposure, dietary habits, exercise and fitness, sexual health, mental health, violence, safety, and injury. Item development was completed by a panel of health experts and also derived from some pre-existing health measures, including the Adolescent Health in South Australia survey (1995; Women's and Children's Hospital, Adelaide), the Sports Injury Data Collection Form (1996; Sports Medicine Australia), and the Youth Risk Behavior Survey (1993; CDC). Analyses conducted by the survey development team from pilot testing with 531 high school students indicated moderate reliability and validity; however, no empirical investigations utilizing this scale have been published since its initial development. Thus, future research is needed to supplement both the statistical and clinical use of this scale or others intended to assess health-related behaviors in youth.

In addition to single measures that assess multiple health-promoting behaviors, researchers also focus on just a single aspect of healthy living, such exercise and diet. These constructs are conceptualized in different ways across studies. Other behaviors such as sleep hygiene and safety habits are less frequently studied in youth.

Kohl, Fulton, and Caspersen (2000) reviewed the literature base on physical activity assessment in order to synthesize the numerous ways in which this construct has been operationalized across more than 50 previous studies with youth. Self-report of exercise in regard to nature, duration, and frequency was the most commonly employed procedure, usually involving recall methods of physical activity habits in the recent past (e.g., 1 day to 1 month periods). Questionnaires to assess recall of activity were either

interview-administered or self-administered. Personal diaries to log physical activity were rarely used, most likely due to the adherence needed to daily record the information needed. Other assessments included direct observation of physical activity and monitoring devices such as heart rate monitors. Although choice of a particular method varied according to study design, the researchers suggest that self-report was most commonly employed due to ease of administration and interpretability. However, the authors caution that future researchers consider validity of self-report measures, as validity coefficients from previous studies range from .57 to .72 for adolescents (i.e., over 10 years of age). Based on his review of previous studies, Trost (2007) cautions against the use of self-report methods for children under 10 years of age, as they demonstrate difficulty recalling activities and estimating the correct time frame in which they engaged in activities.

Substance use is often included in measures of health-compromising behavior among youth, such as items from the YRBS described above. However, this factor can also be studied as a health-promoting behavior, when assessing the degree to which individuals refrain from substance use and adhere to attitudes that it is harmful. These positive attitudes and behaviors have been assessed among early adolescents by various groups of researchers examining the impact of drug prevention programming in schools (Ghosh-Dastidar et al., 2004; Kovach Clark et al., 2010). The attitudes toward substance use (i.e., alcohol, cigarettes, and marijuana), also termed as *prodrug beliefs*, assessed by these research teams include expectations of one's future substance use as well as beliefs about the consequences of substance use, both positive (e.g., relaxation, fun, and escape) and negative (e.g., risk of addiction, social and academic trouble). Assessment of

attitudes toward substance use has been used more widely than assessment of actual use among samples of early adolescents. This is largely due to the notion that while most youth in this age group (i.e., 6th to 8th grade) are forming opinions of potential positive and negative consequences from using substances, fewer numbers have tried such substances or feel comfortable reporting this behavior (Kovach Clark et al., 2010). Thus, attitudes toward substance use was the construct assessed in the current study.

Assessment of sleep in youth began to receive increasing attention in the literature over the past decade (Dahl & Harvey, 2008). Tools can include items related to either sleep hygiene or to potential sleep problems or disorders, the latter of which is much more common. Both the Children's Sleep Habits Questionnaire (CSHQ: Owens, Spirito, & McGuinn, 2000) and the Sleep Disorders Inventory for Students (SDIS: Luginbuehl, 2003) tap potential sleep disorders such as sleep apnea or periodic limb movement disorder rather than healthy sleep habits (bedtime, average hours of sleep, consistent sleep schedule). Both of these published measures of sleep assessment in youth rely on parent report. To assess basics of sleep hygiene, a brief, 5-item screening measure was developed to gather parent report on regularity of sleep patterns, night awakenings, and bedtime issues (Owens & Dalzell, 2005). Other researchers have developed single items for youth to self-report on their sleep patterns. For instance, Alfano et al. (2009) examined the relationship between sleep and anxiety in adolescents, utilizing both the CSHQ and two items "Do you usually have trouble sleeping?" and "Do you usually have trouble waking in the morning?". Overall, most measures of sleep behavior rely on parent report because observation of the child's sleep is necessary to report on behaviors

while asleep; however, youth self-report of sleep habits has been used successfully in previous research.

Perhaps the most understudied health-promoting behavior for youth are their routine safety habits (Bennett, Bendersky, & Lewis, 2007). One way this construct has been operationalized is by determining how frequently children and teens use caution with transportation, such as helmets and safety belts. Specifically, in one of the first studies to include this in an international sample, Lindberg and Swanberg (2006) developed self-report items to assess the frequency students reported wearing a bicycle helmet and a vehicle seatbelt. Bennett and colleagues (2007) used four similar items from the Youth Risk Behavior Survey (Centers for Disease Control & Prevention, 2001) among a sample of 10-11 year olds. In addition to use of bicycle helmet and seatbelt use, these youth were also asked to report the frequency they wore a helmet when rollerblading or skateboarding and whether they had ever ridden in a car driven by someone who had consumed alcohol. Overall, research of safety habits in youth is limited in scope and replication of current findings. The current study will provide further information regarding this understudied indicator and its relationship with the well-being of youth.

Researchers have demonstrated that although health-related behaviors may be conceptualized individually, there is a significant inter-relatedness between these constructs. Pate, Heath, Dowda, and Trost (1996) found that among a sample of over 11,000 high school students who completed the YRBS (CDC, 1990), those reporting low physical activity (i.e., fewer than two days of light exercise and no days of hard exercise in the past 14 days) were also more likely to consume no fruits or vegetables, use

marijuana, refrain from using seatbelts, and have one or more sexual partners within the previous three months (Odds Ratios [ORs] ranging from .77 to 2.64). Thus, while behaviors may be dichotomized as either health-compromising or health-promoting, there is also a significant level of inter-relatedness between these constructs. These findings may have important implications for future research examining global vs. specific assessment of these factors.

The current study provided an examination of five key health-promoting behaviors studied across cross-cultural samples of early adolescents. Assessment of both risky and adaptive health behaviors in older adolescents has also included sexual health and sexual disease prevention (CDC, 2007); however, this domain was not included in the current study due to developmental level of participants in the sample. In addition, the use of sun protection as a health behavior has been examined to a lesser degree in the adolescent literature base and has no hypothesized links to mental health and was therefore also not included in the current investigation (Stanton, Willis, & Balanda, 2000).

While the relationship between physical functioning and SWB has been reviewed in previous sections of this chapter, a more specific focus is provided below on how health-promotion (i.e., the wellness aspect of physical health) and SWB (i.e., the wellness aspect of mental health) relate. Researchers focused on a mind-body connection are urging the importance of an overall approach to wellness, rather than a medical vs. psychological study. Currently, this line of research is dominated by studies examining the impact of physical *illness* on mental health (Blackman & Gurka, 2007; Egede, 2007; Hexdall & Heubner, 2007), many of which have focused on adult populations. A focus

on the relationship between physical *wellness* (e.g., health-promoting behaviors) and SWB among individuals provides a next step toward conceptualizing what factors comprise a comprehensive wellness model.

Moving Toward a Model of Comprehensive Wellness: The Relationship between Health-Promoting Behaviors and SWB

The examination of health-promoting behaviors is not only important to understand the health-related lifestyle of populations, it is also necessary to determine how these behaviors relate to various environmental and psychosocial factors. Studies of health promotion aim to identify which factors relate most closely to engaging in healthy behaviors, and in addition, how practicing a healthy lifestyle relates to individuals' overall well-being. Just as there has been a growing movement within the field of psychology toward examination of positive psychology constructs, a similar focus has evolved toward health psychology and holistic health research. This sentiment has been echoed in both the adult and adolescent research fields. Harris, King, and Gordon-Larsen (2005) assert that "healthy habits among children lay the groundwork for positive youth development" (pg. 111). While the importance of attending to holistic health and wellness promotion has been highlighted, a dearth of literature still exists within this area of research. One seminal study conducted with young adults (i.e., college-age students) examined the relationship between health-promoting behaviors and SWB, and measured each construct comprehensively with previously validated measures (Levy, 2003). However, other studies have been limited in their investigation of the mind-body wellness connection by focusing on only one aspect of health-promotion (e.g., physical activity) or measuring constructs with vague, one-item indicators. In addition, more

research with samples of American youth is still needed. The following sections summarize the studies that comprise the limited research base in this area.

Research with Adults

In perhaps the most comprehensive study within this area of research to date, Levy (2003) examined the relationship between health-related behaviors and SWB among a sample of 457 adults enrolled in undergraduate courses. Both health-promoting behaviors (i.e., healthy diet, exercise, sleep regimen, responsible drinking, and protective sexual behaviors) as well as health-compromising behaviors (i.e., drinking and driving, compromising safety, risky sexual behaviors, and substance use) were included in this investigation. SWB was measured via two scales: the Satisfaction with Life Scale (SWLW; Diener, Emmons, Larsen, & Griffin, 1985) and the Index of Psychological Well-Being (Berkman, 1971). Based on regression analyses, health-related behaviors accounted for 28% of the variance in life satisfaction as measured by the SWLS. Moreover, health promoting behaviors were found to significantly predict life satisfaction even beyond the effects of other variables ($\Delta R^2 = .08, p < .001$); gender, social support, and depressive symptoms significantly contributed to the variance in the regression model.

While Levy's work included multiple health-related behaviors, Rejeski and colleagues (2001) examined how just one aspect of health-promoting behaviors, physical activity, related to SWB among a sample of 854 adults. The authors hypothesized that rate of physical activity would be positively correlated to SWB, but only by mediation effects of three various cognitive factors: satisfaction with physical function, satisfaction with physical appearance, and self-efficacy. Participants were assigned to either a control

group or a treatment group; those in the treatment group received a 24-month counseling program aimed at promoting the three aforementioned mediators. Findings demonstrated that for *all participants*, an increase in rate of physical activity was positively correlated with increases in SWB and with increases in all three mediators of interest. Follow-up tests demonstrated that changes in satisfaction with physical function provided the strongest mediation effects. This study not only demonstrates a significant link between one type of health-promoting behavior and SWB, it also shows that other cognitive factors (i.e., satisfaction and self-efficacy for the healthy behavior) may play a role in the degree to which engaging in a behavior leads to increased happiness.

Research with Youth

Research with adults has demonstrated some significant links between health behaviors and happiness levels. However, similar investigations of health-promotion as it relates to SWB among youth are extremely limited. To date, three empirical studies have examined the relationship between health-related behaviors and one or more components of subjective well-being among youth, two of which were conducted outside of the United States. Other areas within this body of research include investigations of health-compromising, versus health-promoting, behaviors, as well as a focus on other positive psychology constructs, such as developmental assets and self-efficacy. These studies are summarized below.

Lindberg and Swanberg (2006) recently conducted an examination of well-being in relation to various health and psychosocial factors, including eating and safety habits, social relationships, somatic symptoms, anxious/depressive symptoms, and aggressiveness among 12 year old children in Sweden. Self-rating scales were completed

by approximately 800 participants to assess SWB, measured via a very broad one-item indicator, “How are you these days?”. Participants who endorsed ‘very well’ or ‘rather well’ were defined as having good well-being. Health-promoting behaviors assessed were limited to eating habits (e.g., a diet including fruits and vegetables and healthy snacks) and safety habits (e.g., wearing a bicycle helmet and seat belt). Responses from participants were used to classify their eating and safety habits as either ‘good’ or ‘poor’. Preliminary analyses showed that gender was significantly related to well-being among the sample, and was thus controlled for in all subsequent tests. Based on results of regression analyses, six of the eight predictors assessed were significantly related to well-being, with the exception of safety habits and aggressive behavior. Eating habits were one of the significant, positive predictors of students’ well-being (odds ratio OR = 3.01, $p < .001$). Certainly, there is a need for replication of these constructs with American adolescents; also, a reliable and valid multi-item assessment of SWB is needed, as well as comprehensive assessment of all health-promoting behaviors adolescents may engage in, reviewed extensively above.

In an investigation of secondary students in Hungary, Piko (2006) examined the degree to which a few health-related behaviors (i.e., exercise, diet control, and substance use) were predictive of individual’s life satisfaction, measured via the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). While items regarding risky behavior were adapted from previous research (Gerrard, Gibbons, Benthin, & Hessling, 1996), very little information is provided regarding the specific items used to assess the health-promoting behaviors of exercise and diet control. Substance use was assessed as the frequency of smoking, drinking, and drug use during the previous three months.

Rates of actual use of these substances in this sample were not reported. Piko found that diet control had a significant positive contribution to adolescents' life satisfaction, while smoking had a significant negative contribution. Other health-related behaviors (i.e., exercise, drinking, drug use) were not significant predictors. Similar to Lindberg and Swanberg's study (2006), future research is needed with more statistically sound assessments of both SWB and health-related behaviors in order to more accurately conceptualize the relationship between physical and mental wellness in youth.

The third, and to date, only other examination of an SWB construct related to health promotion, utilized a sample of American children ages 8-12 years (Holder et al., 2009). Time spent engaging in both active leisure (i.e., athletic activities and involvement in sports) and passive leisure (i.e., television viewing, computer and phone) as well as feelings about these types of activities were reported by both children and their parents. In addition, child participants rated how happy they felt 'most of the time' using the Faces Scale, developed by this research team, to assess happiness, or 'well being'. Active leisure was positively correlated with well-being while passive leisure was negatively linked to well-being. In follow-up regression analyses, aspects of active leisure accounted for unique variance in happiness levels, while passive leisure was not a significant predictor. These findings substantiate the importance of viewing the health-*promotion* aspect of physical activity as a separate construct, as suggested by the findings by Kulbok and Cox (2002), detailed previously in this chapter.

A study completed by Murphey and colleagues (2004) also included a focus on both health compromising and health-promoting behaviors in youth, and examined the degree to which engaging in these risky behaviors was related to possessing one of six

developmental assets, outlined by the Search Institute (2007). In line with the positive psychology research field, developmental assets are various social and personal advantages that a child or adolescent may possess to serve a resiliency or adaptive role in their overall functioning. The six developmental assets chosen for this study were high academic achievement, talking with parents about school, representation in school decision-making, participating in youth programs (excluding sports), community volunteering, and feeling valued by the community. Overall, these assets were significantly and inversely related to engagement in risky behaviors, as measured by one of the YRBSS (CDC) scales. Students reporting none of the six assets were at greatest risk for engaging in risky behavior. In addition, all six assets were significantly and positively related to engagement in healthy behaviors, which included wearing a safety belt, aerobic exercise 3+ days per week, and wearing a bicycle helmet. These results suggest that aspects of positive functioning, such as developmental assets, have important links to health-related behaviors.

Klein-Hessling and colleagues conducted a study with German elementary-school children to determine how another construct sometimes included under the positive psychology umbrella, self-efficacy, related to health-promoting and health-compromising behavior (Klein-Hessling, Lohaus, & Ball, 2005). Among a sample of 345 fourth grade students, researchers assessed these constructs across a one year period to examine the degree to which self-efficacy, measured via a nine-item scale derived from the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) predicted health-related behavior across time. A 27-item scale constructed by the research team was used to assess health-related behavior among the sample, with 14 questions pertaining to health-promoting

behavior (e.g., “I eat fresh fruits or vegetables several times a week”) and 13 items pertaining to health-compromising behavior (e.g., “I usually sleep less than six hours). Results showed that self-efficacy was a significant predictor of health-promoting behavior (R^2 at Time 1 = .092 and .093 for girls and boys, respectively and R^2 at Time 2 = .169 and .155). This study demonstrates a significant link between one component of mental wellness (i.e., self-efficacy) and physical wellness; however, future research is needed to determine how other components of mental wellness, such as SWB, relate to healthy behaviors.

A similar investigation of self-esteem related to healthy behaviors was conducted in the United States among a sample of 23 overweight adolescents, with a mean age of 15.9 years (Melnyk et al., 2006). Researchers assessed both negative (i.e., anxiety, depression) and positive (i.e., self-esteem) indicators of mental health among these youth and compared this to their healthy lifestyle beliefs/attitudes as well as healthy lifestyle behaviors via descriptive correlations. Healthy beliefs/attitudes were assessed as the participants’ perceptions of the importance of engaging in health behavior as well as their personal self-efficacy for conducting a healthy lifestyle. Healthy behaviors were measured via the 16-item Healthy Lifestyle Behaviors Scale (Melnyk et al., 2006), developed for use with adolescents. In terms of negative mental health indicators, adolescents with higher levels of anxiety and depression had less healthy lifestyle beliefs. In contrast, higher self-esteem was associated with stronger beliefs about efficacy in engaging in a healthy lifestyle. While a specific relationship between mental health variables and healthy *behaviors* was not included in this study, researchers demonstrated that participants with stronger beliefs/efficacy in engaging in a healthy lifestyle also

reported a greater frequency of healthy behaviors. These results suggest that in order to achieve a lifestyle that includes routine engagement in healthy behaviors, a connection with positive mental health constructs must first exist, in that one must have a positive outlook on the importance of these behaviors and believe in their own ability to do so. Future research should examine how other global judgments of mental wellness (i.e. SWB) relate to physical wellness indicators such as health-promoting *behavior*.

Overall, a comprehensive examination of the studies that highlight both mental and physical wellness among youth to date shows that significant links between mind and body certainly do exist. Youth who report positive mental health, including happiness, developmental assets, and self-efficacy, also report engaging in more health-promoting behaviors. However, limitations to these studies exist, including ambiguity of the constructs that were measured and questionable validity of some assessments used. Another potential weakness of these studies is the lack of attention paid to whether various population variables (e.g., gender, ethnicity) may influence the mental-physical wellness connection found among samples of youth. The following section outlines various demographic and situational variables that impact individuals' well-being. Identifying these factors is important in order to control for potential influences on the relationship of mind-body wellness among youth.

Variables of Influence on the Physical-Mental Wellness Relationship

To better understand the relationship between children's mental well-being and their health-related behaviors, potential influences on the strength of this relationship must be considered. Specifically, various demographic factors may impact the degree to which mental and physical wellness relate. Three potential variables that may influence

the mental-physical wellness relationship in youth are gender, ethnicity, and SES. This hypothesis can be made based on the current literature base supporting demographic differences in regard to health related behaviors and beliefs (Manly, 2006; Pate et al., 1996; Spear & Kulbok, 2001). Of note, differences in SWB according to gender, race, and socioeconomic status (SES) have not been found; however, studies of these relationships have been limited to African-American and Caucasian youth (Huebner, Suldo, & Gilman, 2006).

Gender differences in health-related behaviors. In a review of studies focused on prevention and health promotion in adolescents, Spear and Kulbok (2001) found that gender and ethnicity were among the primary factors related to health behavior. Several studies included in this review found that females were more likely to practice several health-promoting behaviors (i.e., nutrition, grooming, and safety habits) than males, with the exception of physical activity, which males were more likely to engage in (Newell-Withrow, 1986; Pate et al., 1996; Wu et al., 2006). Due to a larger body of research on two health-promoting behaviors in particular, dietary intake and physical activity, more gender differences have been documented for these healthy behaviors than others. In terms of dietary habits, significant differences between boys and girls have been noted, but as a whole, the literature base in this area does not highlight one gender as ‘healthier’ in regard to diet. For instance, Munoz, Krebs-Smith, Ballard-Barbash, and Cleveland (1997) examined food intake among a sample of 3,307 children and adolescents by analyzing the US Department of Agriculture’s 1989-1991 Continuing Surveys of Food Intakes by Individuals. While boys met minimum food group intake recommendations for three food groups (grains, vegetables, and meat), girls did not meet minimum

recommendations for any group. These results suggest healthier dietary habits for males; however, findings from the Minnesota Adolescent Health Survey (MAHS) indicate that a larger majority of boys vs. girls (65% vs. 48%, respectively) had a daily dietary intake consisting of 30% or more fat and 10% or more saturated fat (Neumark-Sztainer, Story, Hannan, & Croll, 2002). The researchers hypothesized that this disparity is likely attributed to the different food group intake of boys and girls.

Differences have been reported in both the type and amount of physical activity that boys and girls engage in. Among high school students, for instance, males were reported to engage more frequently in interactive, team sports such as football and basketball while females' most frequent activity types included swimming, bicycling, and dancing (Pate, Long, & Heath, 1994). A more recent study by this group of researchers confirmed that males are more likely to participate in high school sports teams (Pate, Trost, Levin, & Dowda, 2000). Findings across several national studies also note significantly higher activity levels among males, including participation in exercise programs, sports teams, and leisure-time activities (Dowda, Ainsworth, Addy, Saunders, & Riner, 2001; Pate et al., 2000). Data from the most recent YRBSS (Centers for Disease Control, 2007) indicate that nearly twice the percentage of male adolescents (43.7%) versus female adolescents (25.6%) report having met recommended levels of physical activity in a given week (i.e., any kind of physical activity that increases heart rate and breathing for 6 minutes per day, 5 days per week).

Gender differences have also been reported for other health-related behaviors, including safety habits (seat belt and helmet use), substance use, dietary behavior, and physical activity. Wu, Rose, and Bancroft (2006) found gender differences in these

types of behaviors measured via a 51-item instrument adapted by the researchers from the YRBSS (CDC, 2000), among a sample of nearly 700 8th graders. Based on chi-square analyses, male students were more likely to engage in alcohol use, be involved in fights, and also to participate in physical activity.

Ethnic differences in health-related behavior. In addition to gender, differences among ethnic groups have also been highlighted across studies of health-related behaviors. Among key findings of the studies reviewed by Spear and Kulbok (2001), White students were more likely to engage in one health-compromising behavior (smoking cigarettes) and one health-promoting behavior (using seatbelts) than African-American students (Kann et al., 1993). This same group of researchers also found that Hispanic students were the least likely of various ethnic groups to wear motorcycle helmets. Findings from an earlier study reviewed by Spear and Kulbok showed that African-American teens reported to engage in more self-care behaviors, including hygiene and exercise, than White teens (Newell-Withrow, 1986). Spears and Kulbok caution that, at the time their review was conducted, many studies included samples of primarily White youth which are not representative of current U.S. census data and do not allow for true comparisons across ethnic groups. Also, differences between groups are somewhat inconsistent across studies and it is difficult to determine whether one demographic group truly engages in more health-promoting behaviors than another. For instance, ethnic differences in rates of physical activity are inconsistent across studies. Data from the most recent YRBSS (CDC, 2007) indicate that 37% of Caucasian youth report meeting the recommended levels physical activity in a given week (see definition above), versus 31.1% of African-American teens and 30.2% of Hispanic teens. This

pattern of prevalence rates remained consistent when analyzed according to ethnicity X gender as well. In contrast, however, more Hispanic (61%) and African-American students (55.8%) reported attending physical education classes than Caucasian youth (50.4%). Together, these data reflect differences in type and vigor of physical activity, but not necessarily total amount.

SES differences in health-related behaviors. Socio-economic status (SES) is also related to variations in youth's health habits, and has the most documented empirical link to dietary intake. Family income or SES has been the focus of numerous studies seeking to identify factors that impact dietary intake among adolescents and their families. Among approximately 200 Australian children (mean age 11 years), SES was negatively correlated with individual's waist measurements (Dollman, Ridley, Magarey, Martin, & Hemphill, 2007). Amount of fat in one's diet served as a moderator to this relationship for the boys in the sample, but not for the girls. Higher cost of healthier diet options has been well-documented as a key factor in the relationship between SES and fruit and vegetable consumption when surveying adults (Cawley, 2006; Dibsall, Lambert, Bobbin, & Frewer, 2003). Specifically, adults from low SES backgrounds report higher consumption by themselves and their children of cheaper, energy-dense foods that typically have higher concentrations of fats and sugars (Cawley). Dibsall and colleagues found that budget concerns was the most commonly endorsed reason for adults in a European sample reporting consumption of 0-2 servings of fruits and vegetables per day. While studies such as Dibsall et al. survey only adults, similar relationships may apply for children, as they often consume the foods their parents purchase.

Examination of how SES relates to other health-related behaviors is more limited in the current literature base, but a few researchers have identified how SES is linked with physical activity and safety habits. SES was unrelated to a sampling of habitual physical activity when a sample of 1,318 children (8-10 years old) and adolescents (14-16 years old) in Denmark were studied and asked to wear an accelerometer over five days (Kristensen, Korsholm, Møller, Wedderkopp, Andersen, & Froberg, 2008). Although an objective measurement of physical activity was utilized, the crude measurement of SES in this study (i.e., average gross income of families in the surrounding area of children's schools) may have limited accuracy of the findings. Individual reporting of income, while perhaps not feasible for large sample sizes, would provide a more precise measure of SES. More significant relationships are highlighted for SES and organized/group vs. individual physical activity among youth. Johnston and colleagues (2007) found that participation in organized sports correlated negatively with SES for a nationally representative sample of 8th to 12th graders. The researchers hypothesized that disparities in resources across SES groups such as transportation and school facilities may contribute to differences in participation rates.

Differences in one type of safety habit, seatbelt use, were identified across groups of high school students from different school settings (Shin, Hong, & Waldron, 1999). Comparisons were made between students from three school settings - private, middle class, and inner city. Self-reported seatbelt use was lowest among students from the inner city school setting. Less parent modeling of seatbelt use and lower perceived control over one's own safety among inner city youth were identified as social influences contributing to the group differences found. Parent education was also assessed and used

as an individual indicator of SES, but the association between this variable and seatbelt use was insignificant after controlling for type of school setting.

In summary, while significant differences across demographic groups (i.e., gender, ethnicity, and SES) highlight the importance of attending to these variables when assessing health behaviors, the literature base does not provide conclusive findings on which groups demonstrate a consistently ‘healthier’ profile. Youth from a certain gender or ethnic group may report higher levels of one health-promoting behavior while also reporting higher levels of one or more health-compromising behaviors. For instance, males have been found to engage in higher rates of physical activity (CDC, 2007) while also reporting higher rates of alcohol use (Wu et al., 2006). In addition, youth from low SES backgrounds may have an unhealthier dietary intake, but findings for other health-related behaviors are inconsistent and limited in scope. The current study will specifically examine the statistical and clinical impact that gender, ethnicity, and SES have on the relationship between health-related behaviors and the mental well-being (i.e., SWB) of youth.

Conclusions

This chapter has reviewed two critical components to conceptualizing wellness, both from a mental wellness perspective as well as a physical wellness perspective. A definition and review of SWB was provided as a means for addressing mental wellness in youth. Empirical research supports SWB as a separate, yet related construct to psychopathology. Thus, we now understand that mental wellness is not simply the absence of mental problems or ‘illness.’ When conceptualizing physical wellness, various factors may be considered, one of which is health-related behaviors. When

considering ways to assess for and plan a comprehensive wellness program, focusing on health-related behaviors may provide the greatest capacity for change, versus a focus on chronic illness or activity limitation due to physical pain, which are both difficult if not impossible to modify. To provide a picture of ‘comprehensive wellness,’ encompassing both mind and body, understanding the relationship between SWB and health-related behaviors is necessary. Currently, there is a paucity of research examining the degree to which engagement in health-related behaviors relates to subjective well-being among children and adolescents. Although one study has examined these relationships with adults, studies with youth have only been conducted with three samples to date, and are quite limited in terms of the use of validated measures of these constructs. Thus, the current study was primarily exploratory in nature. Five key health-promoting behaviors that have been most widely examined in the literature base were included to provide a comprehensive assessment of health promotion among participants. If a significant relationship does indeed exist between these constructs of mental and physical health, results of the current study may be used to inform and develop comprehensive wellness promotion programs for youth. The current literature base also demonstrates significant demographic differences in regard to health-related behaviors. The proposed study will include an examination of how gender, ethnicity, and SES may influence the relationship between SWB and health-promoting behaviors.

In addition to providing data for designing wellness programs/interventions with a holistic, ‘mind-body’ approach, another goal of this study is to provide a clearer understanding of how to tailor health plans and strategies that are pertinent to diverse groups of adolescents. In a discussion of factors to consider when designing wellness

programs for diverse youth, Trickett and Birman (2000) assert that interventions must be both ‘ethnically valid’ and framed within individuals’ ecological framework. Data from the current study may assist in highlighting which health-promoting behaviors have the strongest relationship with overall happiness, and how these relationships vary across demographic groups. Future researchers and practitioners can use this type of information to design wellness programming that is both relevant and influential for diverse groups of early adolescents.

CHAPTER 3

METHOD

Selection of Participants

Participants consisted of students enrolled in grades six through eight at one middle school from a school district in West Central Florida. Students enrolled full-time at the middle school who obtained parental informed consent in writing (see Appendix B) were included as participants. In addition, students were asked to sign a student assent form (see Appendix C) or give their verbal assent, depending on age, at the time of data collection. Participation was not sought from students served exclusively in self-contained special education classrooms due to lack of the reading and reasoning skills necessary for survey completion.

The researcher visited each homeroom across grade levels and briefly described the purpose of the study with teachers and students and asked that an informed consent letter be sent home with each student (N = 1,109). An additional parent consent form translated in Spanish was sent home with 23 identified students based on parent's native language gathered from school records.

Teachers were informed by the researcher that all students who returned signed parent consent forms would be included in the study. Although students were not paid for participation, incentives were offered to increase participation rate. Specifically, to encourage return of parent consent forms, the homeroom teacher from each grade level who collected the most signed parent consent forms from their homeroom students

received a \$30 gift card. Also, the homeroom class in each grade level with the highest ratio of student participants to overall class size was treated to a snack party. Following a two-week timeframe, 22% ($n = 249$) of the student population returned signed parent consent forms, slightly under typical response rates of approximately 30% documented in previous research requiring active parent consent (Pokorny, Jason, Schoeny, Townsend, & Curie, 2001).

Participants

Demographic characteristics of student participants who were included in the dataset analyzed in the current study are provided in Table 1. There were 154 females and 93 males in the sample. A large majority ($n = 204$) of adolescents (83%) were of White racial background, 9% were Hispanic, and 8% were of other ethnicities. Approximately 40.9% of youth in this subgroup were eligible for the reduced-cost or free school lunch program, used as an indicator of low socioeconomic status. Nearly half of the sample was seventh grade students. Comparisons were made between the sample and the larger school population from which participants were drawn to determine population validity when interpreting later findings (Florida Department of Education, 2011). The proportion of participants from a White racial background was representative of the larger school population (86% White students). Female students were largely overrepresented in the sample compared to school enrollment (62% vs. 49%). Finally, participants eligible for free or reduced-cost school lunch closely matched the 40.8% of students in the larger school population receiving this program.

Table 1
Demographic Characteristics of Participants (N = 247)

	n	%
Gender		
Male	93	37.7
Female	154	62.3
Grade		
6	79	32.0
7	116	47.0
8	52	21.1
Ethnicity		
Asian	9	3.6
African American	4	1.6
Hispanic	23	9.3
Multi-racial	6	2.4
Caucasian	204	82.6
Other	1	.4
SES		
Low	101	40.9
Average/High	146	59.1

Compared to 2010 US Census Data, the following groups are underrepresented: African-American students (1.6% vs. 12.6%) and Hispanic/Latino students (9.3% vs. 16.3% nationally). Groups overrepresented when compared to Census Data include: Caucasian (82.6% vs. 72.4% nationally) and students from low socioeconomic status (SES; 40.9% vs. 25.31%). Notably, Census Data are categorized by race separately from ethnicity, so direct comparisons cannot be made with the current sample for this variable.

In addition, SES is measured as income by the US Census Data and by eligibility for free or reduced lunch program in the current study.

Setting

The middle school under study was located in a rural community in West Central Florida. Total enrollment for the 2010-2011 school year was approximately 1,109 students. This school was selected because the researcher of this study was familiar with administrators and support staff from the district and school who were able to facilitate data collection. Surveys were completed in groups of approximately 25-70 students in a large, centralized meeting room on the school campus.

Measures

Demographics Form. The demographics form (see Appendix D) contained questions regarding gender and grade. Two sample Likert-type questions were included to train students in how to answer Likert-type questions using an example of a frequency (“I go to the beach”) and agreement (“Going to the beach is fun”) item. Students rated the items on a scale of 1 to 5. These sample questions represent the general format of the subsequent measures of SWB and safety habits that were administered. One final question was included to show students how to estimate serving size based on pictorial cues (“How many servings of dog food would a medium-sized dog eat each day if one serving = size of whole tennis ball?). This sample item represents the format for part one of the NESS.

Subjective Well-Being (SWB) Scales

Students’ Life Satisfaction Scale (SLSS; Huebner, 1991). The SLSS (see Appendix E) is a seven-item measure of global life satisfaction. Respondents are asked

to indicate on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*) the degree to which they endorse general statements about their life (e.g., “My life is going well,” “I wish I had a different life”). Scaled scores are obtained by reverse-scoring negatively worded items, then summing the responses and dividing by the number of items to yield an overall judgment of life satisfaction. Higher scores represent higher levels of life satisfaction. The use of self-report to measure life satisfaction is grounded in a theoretical basis that life satisfaction is a subjective perception based on an individual’s internal standards. Concerns over the SLSS as a self-report measure have been addressed through research. Specifically, Huebner (1991) found that the SLSS yielded a small, non-significant correlation with a measure of social desirability ($r = .05$).

The SLSS has high internal consistency (coefficient alpha = .82) and test-retest reliability at 1-2 weeks ($r = .74$ and $.68$; Huebner, 1991; Terry & Huebner, 1995). Temporal stability across a four week period has also been established ($r = .64$; Gilman & Huebner, 1997). With respect to construct validity, moderate convergent validity has been found between the SLSS and other measures of SWB, such as the Piers-Harris happiness subscale (Piers, 1984) and the Andrews and Withey Life Satisfaction Scale (Andrews & Withey, 1976), with correlations of $.34$ to $.62$ (Huebner, 1991). Further evidence of convergent validity has been found by comparing children’s SLSS scores and parent ratings of their children’s happiness ($r = .54$; Gilman & Huebner, 1997). The SLSS has been used among diverse samples of children and adolescents to determine global life satisfaction, including children identified with learning disabilities and emotional handicaps (Huebner & Alderman, 1993) and children from different ethnic backgrounds (Huebner, 1995). In the current study, coefficient alpha = $.87$.

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

The PANAS-C (see Appendix F) was adapted from the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a twenty-item measure of positive and negative affect developed for use with adult populations. It has been used in subsequent measurements of subjective well-being throughout the past decade (Huebner & Dew, 1995; Kercher, 1992; Watson et al., 1988). This scale assesses the degree to which individuals experience positive and negative affect in daily life by rating a list of emotion descriptions such as ‘mad’, ‘delighted’, and ‘gloomy.’ The PANAS-C is a recent version of the PANAS, modified for use with children and adolescents. The PANAS-C includes the addition of ten emotion descriptors and minor modifications of PANAS items to adjust for lower readability and comprehension levels (e.g., removal of abstract words such as ‘hostile’ and addition of concrete descriptors such as ‘happy’ and ‘calm’; Laurent et al., 1999).

The PANAS-C consists of two self-report scales: one 12-item scale measures positive affect and one 15-item scale measures negative affect. Respondents rate words that describe feelings and emotions on a five-point likert-type scale ranging from 1 (*very slightly or not at all*) to 5 (*extremely*) to indicate the extent to which they have experienced each mood or feeling in the past few weeks. Examples of positive affect descriptors include ‘interested,’ ‘excited,’ and ‘proud.’ Negative affect adjectives include terms such as ‘jittery,’ ‘lonely,’ and ‘sad.’ Scores are summed for each scale to generate an overall score of positive and negative affect.

Adequate reliability and validity data have been established for the PANAS. Internal consistency is .92 for both the positive and negative scales. The correlation

between the positive and negative subscales is $-.16$ (Laurent et al., 1999). The positive and negative affect scales were compared with existing self-report measures of anxiety and depression to determine construct validity (Laurent et al., 1999). Convergent validity was established between the negative affect scale of the PANAS-C and the Children's Depression Inventory (CDI; Kovacs, 1985; $r = .60$). Additionally, adequate discriminant validity was found between the positive affect scale and the CDI and the State-Trait Anxiety Inventory for Children (STAIC; Spielberger & Gorsuch, 1973), with correlations of $-.42$ and $-.20$, respectively. Successful use of the PANAS-C to study affect among child populations has been documented since its preliminary development as well (Jacques & Mash, 2004; Laurent, Catanzaro, & Joiner, 2004). In the current study, coefficient alphas = $.88$ (positive affect) and $.89$ (negative affect).

Health-Promoting Behaviors Scales

Nutrition and Exercise Survey for Students (NESS; Curtiss, 2005). The NESS (see Appendix G) is a 15-item self-report measure of diet and physical activity developed for use with adolescents in grades 6 through 12. For the 7 questions pertaining to diet, respondents indicate the number of servings per day (0-7) that they consume from each of the 6 USDA My Pyramid food groups (U.S. Department of Agriculture [USDA], 2005). Guidelines for determining serving sizes are provided via picture references (i.e., 1 serving of vegetables = size of a tennis ball [shown pictorially]). A seventh item asking respondents to indicate why they consume fewer than five servings of fruits and vegetables was not included in the current study due to low internal consistency. Adequate internal consistency reliability among the six items was found for the current sample ($.74$).

Participants rate their physical activity via 6 items by indicating the frequency (i.e., number of days per week) and duration (i.e., amount of minutes per time) of various activities they have engaged in during the past 7 days. Activities are categorized as vigorous (i.e., activities such as basketball that ‘make you breathe hard’), moderate (i.e., activities such as brisk walking that ‘do not make you breathe hard’), and mild (e.g., strength training, yoga, etc.). An additional item assesses the number of hours that students spend engaged in sedentary activities (i.e., TV viewing, playing video games and spending time on the computer, reading, and completing homework). Finally, one item related to reasons for not engaging in daily physical activity was omitted from the physical activity section of the NESS due to poor internal consistency in previous research (Curtiss, 2007). Recommendations set in *Healthy People 2010* (United States Department of Health and Human Services, 2000) were used to determine healthy vs. unhealthy physical activity. Results from the current study indicated high internal consistency (.81) for this scale.

The original NESS survey was created via a joint research effort between a school district and university staff from a southeastern state, in order to obtain descriptive information regarding student’s health habits from a local high school. Significant revisions were made to the NESS following panel expert review and pilot study results, including wording changes for clarification as well as modifications to enhance respondents’ understanding of diet portion sizes using visual examples. The NESS was used successfully in previous research with a sample of 527 adolescents from grades 6 and 9 (Curtiss, 2007). Adequate internal consistency reliability was established from this study (.71 and .77 for diet and physical activity, respectively). Notably, items from the

NESS represent similar self-report questions included on the National Longitudinal Study of Adolescent Health, a nationally representative longitudinal study of nearly 15,000 adolescents in grades 7 to 12 (Add Health; Harris, Florey, Tabor, Bearman, Jones, & Udry, 2003).

Sleep Hygiene and Safety Habits. To date, established screening tools to assess sleep hygiene have been developed as parent report measures. However, the National Longitudinal Study of Adolescent Health (Harris et al., 2003) has used self-report questions to assess sleep hygiene among samples of youth in grades 7 to 12. These three self-report questions were used in the current study to assess amount and timing of sleep (see Appendix H). Respondents indicated the total hours of sleep per night they usually obtain (<7 to 10+ hours) and their bedtime on weeknights and on weekends (<10:00 pm to >12:00 am). These items were modified for clarification in the following ways: 1) signs of '<' and '>' were changed to '*less than*' or '*before*' and '*more than*' or '*after*', respectively; and 2) days of the week encompassed by the terms '*school nights*' and '*school days*' were added (e.g., the words '*Saturday and Sunday morning*' were added after the question regarding wake time on weekends). Two additional questions developed by the author of this proposal were included to assess morning wake time on weekdays and weekends as well. Questions regarding regularity of evening sleep time and morning awakenings are included on parent-report sleep screening measures, such as the 'BEARS' ([B=Bedtime Issues, E=Excessive Daytime Sleepiness, A=Night Awakenings, R=Regularity and Duration of Sleep, S=Snoring]; Owens & Dalzell, 2005). Each of these sleep items were used to provide descriptive information regarding participant's sleep habits; only the item assessing total average hours of sleep per night

was used in subsequent correlational and regression analyses.

Safety habits were assessed via four self-report items in which respondents were asked about their use of helmets when riding a bike and rollerblading or skateboarding, whether they wear a seat belt when riding in a car, and whether they had ever ridden in a car driven by someone who has been drinking alcohol (see Appendix H). These items are adapted from the National Longitudinal Study of Adolescent Health (Add Health; Harris et al., 2003), the Youth Risk Behavior Surveillance System (YRBS; Centers for Disease Control and Prevention, 2007) and a large-scale international study examining subjective well-being and health habits among 807 12-year old youth (Lindberg & Swanberg, 2006). Wording of the items is aligned with the YRBS and Add Health study items, which are more consistent with American colloquial speech and have been used with larger sample sizes of youth.

Few measures currently exist to assess behaviors of healthy sleep habits and safety habits. Measures utilized in the current study were adapted from items used with the largest, most representative samples of youth; however, reliability and validity of these items has not yet been established. Thus, a pilot sample was administered the Sleep and Safety Habits Questionnaire prior to data collection to determine one week test-retest reliability. Further detail regarding the pilot sample is provided in the next section of this chapter.

Attitudes Toward Substance Use. Eighteen items from the Pro-Drug Self-Report Questionnaire previously used in evaluations of the national substance use prevention program, Project ALERT (BEST Foundation for a Drug Free Tomorrow), was used to assess attitudes toward substance use (see Appendix I). These items have successfully

been used with large, national samples of middle school students in grades 6 through 8 across several teams of researchers (Ghosh-Dastidar et al., 2004; Kovach Clark et al., 2010; St. Pierre et al., 2005). Using a 4-point likert-type scale, students were asked to rate their beliefs about consequences of using the following three substances: alcohol, cigarettes, and marijuana. Items from the positive consequences and negative consequences subscales were included in the current study based on adequate reliability (coefficient alphas .72 to .90) reports for these subscales of the measure (Kovach et al.). In the current study, coefficient alphas for each of the subscales were as follows: .64 (attitudes toward alcohol use), .72 (attitudes toward cigarette use), and .75 (attitudes toward marijuana use).

Procedures

Approval to conduct this study was obtained from the University of South Florida (USF) Institutional Review Board as well as from the participating school district in Fall 2010. Data were collected in Spring 2011 by a trained research team of graduate students from USF, along with the researcher.

Prior to data collection with the larger sample utilized in the current study, reliability of the Sleep and Safety Habits Questionnaire, compiled from items across two studies, was assessed. Specifically, a pilot sample of 20 adolescents from grades 6 to 8 was administered this questionnaire prior to data collection to determine one week test-retest reliability. A convenience sampling method of adolescents throughout the surrounding community was utilized to obtain participants for the pilot sample, and verbal parent consent was obtained prior to students' completion of the measure. Adequate test-retest reliability ($r = .74 - .79$) was found across the two time points.

Following pilot testing, a list of students in the larger sample who obtained parental consent for participation was compiled prior to data collection, and a code number was assigned to each student for confidentiality of written responses. Of the 249 students who returned parent consent forms, two were no longer enrolled at the school at the time of data collection. All student participants were asked to report to a centralized, large meeting room in the school during an approved class period on one of two data collection dates in February 2011. Questionnaires were completed in groups of approximately 25-70 students. The researcher read aloud the student assent form to all students prior to completion of the surveys. Students were told that they could withdraw from the study at any time during the course of data collection. One student chose to withdraw from the study following review of the assent letter. Sixth-grade students identified as eleven years of age or younger were identified in the code list and individually asked to give their verbal assent, per USF Institutional Review Board guidelines.

Students were first asked to complete the demographic questionnaire while the researcher simultaneously read the questionnaire aloud. A demonstration of serving sizes was given by the researcher using tangible objects that represented the pictorial cues for the NESS sample item. Participants were then encouraged to ask questions and independently complete the measures described above. Measures in the survey packet were counterbalanced to control for order effects. Specifically, four versions of the survey packet were administered. For example, in packet "A", the order of measures were as follows: demographics, SLSS, PANAS-C, NESS, Sleep Hygiene and Safety Habits, and Attitudes Toward Substance Use. In packet "B": demographics, NESS,

PANAS-C, SLSS, Sleep Hygiene and Safety Habits, and Attitudes Toward Substance Use, etc. The researcher and other members of the research team were on hand throughout the administration of the surveys to assist students with questions (i.e., by reading aloud or clarifying items as needed to individual students) and to ensure independent responding. Upon each student's completion of the measures packet, a member of the research team visually scanned through the packet to check for skipped items or response errors, and students were asked to complete or correct the items as needed. Based on previous research using similar self-report measures with this age group (Suldo & Shaffer, 2008), approximately 50 minutes was allotted for students to complete the measures. A total of 247 student participants completed the surveys, most within a 30 minute time frame.

After student completion of the self-report measures, the researcher provided a confidential list of the names of student participants to the school data clerk. School records for student participants were then accessed by the data clerk to obtain student racial classification and eligibility for the free or reduced-cost school lunch program, as an indicator of socioeconomic status (SES). The data clerk was provided with a \$50 gift card as incentive for assisting with gathering these data.

Ethical Considerations

Several precautions were taken to protect student participants. First, the principal investigator obtained approval from the Institutional Review Board (IRB) at USF and the school district to conduct this research. Documentation of all possible precautions taken to protect human research participants was submitted before conducting any aspect of data collection. All questionnaires included in this study had been used successfully in

previous research with children and adolescents; a pilot sample was utilized to explore reliability of one measure, the Sleep and Safety Habits Questionnaire, for which items were adapted from previous assessments used with large samples of youth.

A parental consent form was sent home with each student, outlining the goals of the project and how the project goals would be undertaken. All potential risks and benefits associated with the child's participation in the study were included in the parent consent letter. The letter provided the researcher's contact information in order to allow parents the opportunity to discuss their concerns and ask questions pertaining to the nature of the proposed project and receive immediate feedback. No parental contact was received via phone or email by the researcher prior to data collection.

A student assent form was administered to all students with parent consent. The student assent form outlined the risks and benefits of the study and allowed students to decline or agree to participate. The researcher calculated readability for the student assent letter to be at a fifth grade reading level using the Flesch Readability test in order to ensure it was suitable for a middle school reading level. Students identified as 11 years of age or younger were also individually asked for verbal consent to ensure their agreement to participate, per research board guidelines. In addition, the principal investigator verbally reviewed the letter with students at the time of data collection and provided ample time to answer all questions and informed students of their option of withdrawal from the study at any time without penalty.

Data Analyses

A-priori sample size for the multiple regression analyses was computed based on guidelines by Cohen et al. (2003) to ensure that a large enough sample size was utilized

in the current study to have sufficient statistical power to detect a significant effect. Using the criteria of a .05 alpha level, five health-promoting behavior predictors in the proposed main effects multiple regression analysis, an anticipated medium effect size of .15, and a statistical power level of .80, the minimum required sample size for the current study was $n=91$. The minimum sample size required for subsequent multiple regression analyses with an additional predictor (i.e., gender, race, or SES) was $n=97$.

A series of statistical analyses were performed to answer the research questions posed in this study. These analyses are described in detail below.

Descriptive analyses. Means, standard deviations, and additional descriptive data (i.e. skew, kurtosis, etc.) for the sample were obtained for all variables of interest, which included: subjective well-being (7-item SLSS and 27-item PANAS-C) and five health-promoting behaviors. Consistent with previous studies (Kasser & Sheldon, 2002; Sheldon, Kasser, Houser-Marko, Jones, & Turban, 2005), an aggregate SWB variable was created by standardizing and summing scores for life satisfaction and positive affect, then subtracting standardized negative affect scores. Internal consistency of scores obtained from each measure was also calculated using Cronbach's alpha in order to determine reliability of each assessment of mental wellness and health-promoting behaviors.

Correlational analyses. To determine the relationships between subjective well-being (SWB) and five health-promoting behaviors within the sample of middle school students, correlation coefficients were calculated between each variable. A correlation coefficient (ranging from -1 to +1) provides information about the strength and direction of the relationship between two variables. An alpha level of .05 was used to determine

statistical significance.

Multiple regression analyses. To determine which health-promoting behaviors were most predictive of subjective well-being, the five health behavior composites (i.e., physical activity, diet, sleep hygiene, safety habits, and attitudes toward substance use) were entered into a simultaneous multiple regression model. The percent of total variance accounted for in subjective well-being by the linear combination of all five health-promoting behaviors was examined. In addition, beta weights (standardized multiple regression coefficients) were reviewed to determine which health-promoting behaviors were unique predictors of subjective well-being, after accounting for the shared variance among the variable. An alpha level of .05 was used to determine statistical significance.

Group differences. Given the gender, ethnicity, and SES differences in health-related behaviors identified in the current literature base, three follow-up multiple regression analyses were conducted. First, a main effects model with gender was conducted to determine if gender accounted for additional variance in SWB beyond that of health-promoting behaviors alone. A follow-up regression model with the interaction terms of gender with each of the five health-promoting behaviors was conducted to determine whether moderating effects of gender occurred. This same analysis process was then conducted with race followed by the interaction term of race and health-promoting behaviors, and then SES followed by the interaction term of SES and health-promoting behaviors. Notably, racial categories were used because participant's ethnic background was not available from school records. Furthermore, race was analyzed as a dichotomous variable of white vs. non-white due to the high percentage of white students

included in the sample. An alpha level of .05 was used to determine whether the interactions of gender, race, and then SES with each health-promoting behavior to predict SWB were statistically significant.

CHAPTER 4

RESULTS

Treatment of the Data

All data were entered into a Microsoft Excel datasheet during the spring of 2011 by the researcher and other members of the research team. Data were then checked for data entry errors. First, data were checked for scores out of range following data entry. When scores were out of range, the survey packet was checked for the correct response and re-entered into the database. Next, the researcher and one member of the research team reviewed the data entered for every fifth participant to check for errors by comparing each survey packet response to the data line that was entered into Excel. Additional data were checked (i.e., data entered for participants immediately preceding and following every fifth protocol) when data entry errors were detected. Approximately 21% of the data were reviewed for accuracy at completion of this process. Data entry errors were negligible. The correct responses were manually entered into the final Microsoft Excel datasheet. Statistical Package for the Social Sciences (SPSS) Version 19 (SPSS Inc., 2010) was used to sum or average variables and conduct descriptive analyses and Statistical Analysis System (SAS) Version 9.2 (SAS Institute Inc, 2008) was used to analyze the data and address each research question.

Composition of Subjective Well-Being Variable

Prior to conducting data analyses, a composite subjective well-being (SWB) variable was created using the measures of global life satisfaction, positive affect, and

negative affect. Intercorrelations between these three variables were all significant ($p < .01$). Specifically, global life satisfaction was moderately positively correlated with positive affect ($r = .29$) and moderately negatively correlated with negative affect ($r = -.21$). Positive and negative affect were negatively correlated ($r = -.30$). Consistent with previous research (Kasser & Sheldon, 2002; Sheldon, Kasser, Houser-Marko, Jones, & Turban, 2005), an aggregate SWB index was created by standardizing each of the three components of SWB into z-scores. Next, z-scores for life satisfaction and positive affect were summed, and standardized negative affect z-scores were subtracted from this total. All subsequent analyses were conducted using the aggregate SWB data.

Composition of Health-Promotion Variables

Healthy diet was calculated as the total reported servings per day of fruits and vegetables consumed by respondents. This is consistent with previous research of eating habits both with adults (Lowry et al., 2000; Sutton et al., 2003) and adolescents (Hilsen, Eikemo, & Bere, 2010). Unhealthy diet was also calculated for descriptive purposes, as the total servings of ‘other foods’ (i.e., soda, candy, corn snacks and sugary snacks). This is also aligned with previous studies’ operationalization of the construct (Hilsen et al.; Lowry et al.). Only the healthy diet variable was used in the subsequent regression analyses.

Following guidelines from previous uses of the NESS (Curtiss, 2005), physical activity was comprised of the mean total days per week of physical activity from the first four items on this subscale. Although only this composite of physical activity was used in regression analyses, descriptive information for sedentary activity (i.e., mean hours per day) was also summarized and is presented in the next section.

Total hours of sleep per night was used as the single-item to assess sleep habits in the regression analyses, but descriptive information regarding bedtime and wake time for participants is provided in the section below. Finally, frequency of the use of safety equipment was calculated by averaging the four items of this scale in order to provide a single, comprehensive score of safety habits across different activities. The two items pertaining to helmet use have also been averaged in previous studies (Lindberg & Swanberg, 2006). To account for the scale discrepancy (categorical vs. frequency) between one of the items (riding in a car with someone who had been drinking) and the other three items pertaining to safety habits, this item was recoded from a categorical to a frequency scale (No = 1, Yes = 3) before averaging the items.

To assess univariate normality of each variable, box-and whisker plots were examined, and skewness and kurtosis of each of the measures were calculated. Values for the dependent variable, SWB, and four of the health-promoting behavior composites were within the normal range of -2.00 to 2.00, while the kurtosis value for one of the health-promoting behaviors, attitudes toward substance use, was outside the normal range (skewness = 1.77, kurtosis = 3.99). Less than 2% of participant responses were missing at random, and missing values were addressed by the use of pairwise case deletion.

Data were also analyzed to detect the presence of multivariate outliers. Fidell and Tabachnick's (2007) guidelines for detecting multivariate outliers were employed; specifically, the Mahalanobis distance statistic was calculated for all subjects. With five independent variables and a criterion of $\alpha = .001$, critical $\chi^2 = 20.52$, one multivariate outlier was identified (value of 32.87) and excluded from further analyses. Thus, a final sample of 246 subjects was retained for further data analyses.

Descriptive Analyses

The demographic characteristics for the total sample are displayed in Chapter 3. Means and standard deviations for SWB and all health-related variables measured via an ordinal scale were computed for the entire sample (N = 246). The results of the descriptive analyses are presented in Table 2. For each variable, higher scores reflect increased levels of the construct indicated by the variable name. Information for categorical items or variables such as hours of sleep and bedtimes and wake times are detailed below.

Table 2

Descriptive Statistics of SWB and Health-Promoting Variables (N = 246)

Variable	Mean	SD	Range
Global LS	4.08	.59	1-6
Positive Affect	3.55	.71	2-5
Negative Affect	1.77	.65	1-4
SWB (z-scores)	.03	2.14	-8 - 4
Healthy Diet	6.41	2.97	0-14
Physical Activity	3.73	1.87	0-7
Safety Habits	2.56	.63	1-4
Attitudes toward Smoking	.36	.39	0-2
Attitudes toward Drinking	.42	.48	0-3
Attitudes toward Marijuana Use	.32	.48	0-3
Total Attitudes toward Substance Use	.37	.39	0-2

Subjective well-being. Overall, participants reported global life satisfaction (one

of the three components of SWB) above the neutral range. Specifically, a mean of 4.08 was computed for the sample, with 4 corresponding to *mildly agree* on the six-point likert-type scale of agreement with statements such as ‘I have a good life.’ The mean positive affect score was 3.55 on the five-point measure of positive affect; this mean score falls between an endorsement of *moderately* (3) and *quite a bit* (4) to experiencing affect descriptions such as ‘excited’ and ‘happy.’ The mean negative affect score was 1.77 on the five-point measure of negative affect; this corresponds to an endorsement of *a little* to experiencing feelings such as ‘upset’ and ‘gloomy’.

Health-promoting behaviors. Means and standard deviations across demographic groups in regard to gender, race, and SES are reported in Appendix A. Responses were fairly consistent across groups. In regard to healthy diet, participants reported consuming an average of 6.43 daily servings of fruits and vegetables combined. Three daily servings of unhealthy foods (i.e., sugar or starch snack foods) was the average amount consumed by the sample.

Days spent per week engaging in some type of physical activity ranged from 0-7, with a mean of 3.73 days. Of the 54% of students participating in physical education (PE) classes at school, nearly all reported going to PE class an average of five days per week. In addition, most (86%) reported spending more than 30 minutes actually exercising or playing sports while in PE. Nearly half of the sample (46.1%) reported that three or more hours per day were spent watching TV, doing homework, or engaging in other types of sedentary activity.

A majority of the sample (61%) reported getting 7-8 hours of sleep per night. A much smaller percentage indicated an average of 9 hours (19%), followed by less than 7

hours (13%), and ten or more hours (7%). Students' weekday bedtime was earlier than weekend bedtime for the majority of the sample; 90% of participants reported a bedtime before 11 pm on weeknights, while only 29% reported a bedtime before 11 pm on weekend nights. All participants reported waking up before 8:00 AM on school days, with 57% up before 6:00 AM. Weekend wake times were later, with 61% waking after 8:00 AM.

A mean of 2.56 was reported for frequency of safety habits, indicating that participants *rarely* (2) to *sometimes* (3) wear helmets, use seatbelts, and refrain from riding with someone who has been drinking alcohol. However, a considerable amount of variance was found when analyzing these four items separately. Specifically, while over one-third of participants reported never wearing a helmet while biking, skateboarding or rollerblading, 91% reported wearing their seatbelt in a car most of the time.

Finally, on average, students had strongly negative attitudes toward using each of the three substances (cigarettes, alcohol, marijuana) assessed, as means ranged from .32 - .42 on a 0-3 likert-type scale.

Additional Treatment of the Data

Notably, a large portion of participants (n = 127) indicated that they did not participate in one or more of three activities included on the safety habits questionnaire (i.e., bicycling, rollerblading/skateboarding, and riding in a car with someone who had been drinking alcohol). Specifically, 14% of the sample indicated that they did not ride a bicycle, 40% reported not rollerblading or skateboarding, and 17% were not sure whether they had ever ridden in a car with someone who had been drinking alcohol. Multiple imputation was used to generate pooled results for these 'missing values' in order to

allow for subsequent predictive analyses to be conducted. This method was used instead of casewise deletion to avoid largely reducing sample size and potentially biasing results (Royston, 2004). Statistical models for five imputed data sets were run and then pooled to yield a single set of results. Means for SWB and the five health-promoting behaviors were compared across the original dataset and the imputed dataset and no notable differences were found.

In addition to removal of one multivariate outlier, described previously, other assumptions of multiple regression were also examined prior to conducting these analyses. Correlations between independent variables were checked for multicollinearity; no correlations between the five variables were above .34. The normal probability plot and scatterplot were examined, demonstrating no violations of normality or linearity.

Correlational Analyses

To address the first research question of the current study regarding the relationship between subjective well-being (SWB) and health-promoting behaviors within the sample of middle school students, Pearson product-moment correlation coefficients were calculated between all variables (see Table 3).

An alpha level of .05 was used to determine statistical significance. All significant correlations occurred in the expected directions. Total hours of sleep per night and attitudes toward substance use were the only two of the five health behaviors significantly linked with SWB. SWB yielded a moderate correlation with attitudes toward substance use ($r = -.33$) and a small relationship with amount of sleep ($r = .23$). Diet, physical activity, and safety habits were not significantly related to SWB. However, different relationships were identified when examining the three components

of SWB separately. All five health-promoting behaviors were significantly correlated with positive affect ($r = .17$ to $-.31$).

Table 3

Intercorrelations between SWB and Health-Promoting Variables (N = 246)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Global Life Satisfaction	1								
2. Positive Affect	.29*	1							
3. Negative Affect	-.21*	-.30*	1						
4. Subjective Well-Being	.69*	.75*	-.70*	1					
5. Healthy Diet	.11	.17*	-.02	.11	1				
6. Physical Activity	.06	.23*	.02	.11	.19*	1			
7. Sleep	.10	.28*	-.14*	.23*	.07	.14*	1		
8. Safety Habits	-.05	.20*	-.11	.13	-.08	.06	.34*	1	
9. Attitudes toward Substance Use	-.18*	-.31*	.26*	-.33*	-.06	.01	-.25*	-.31*	1

* $p < .05$

Intercorrelations between the five health-promoting variables ranged from $r = .01$ to $r = .34$, with many of the relationships not significant. Total hours of sleep was linked to all other health-promoting behaviors, with the exception of diet.

Health-Promoting Behaviors as Predictive of Subjective Well-Being

To determine which facets of health promotion were most predictive of SWB, all five health behavior composites (i.e., physical activity, diet, sleep hygiene, safety habits, and attitudes toward substance use) were entered into a simultaneous multiple regression using a dataset yielded from multiple imputation. Results of this analysis are presented in Table 4. An alpha level of .05 was used to determine statistical significance.

The linear combination of health-promoting behaviors accounted for 15% of the variance in SWB ($F [5,241] = 8.46, p < .05, R^2 = .15$). As shown in the table, a review of

beta weights yielded from the equation indicates that only one of the five health promoting behaviors was a unique predictor of SWB. In other words, after controlling for the shared variance among aspects of health promotion, attitudes toward substance use ($\beta = -.28^*$) independently related to differences in students' SWB. Diet, physical activity, sleep, and safety habits did not uniquely predict SWB. Thus, when all available indicators of health promoting behavior were included into the simultaneous regression, attitudes toward substance use explained the most unique variance in SWB.

Table 4

Simultaneous Regression Analysis for Health-Promoting Behaviors Predicting SWB

Variable	<i>B</i>	<i>SE B</i>	β	<i>sr</i> ²	<i>p</i>
Attitudes toward Substance Use	-1.56	.36	-.28*	.06	<.0001
Sleep	.37	.22	.13	.02	.09
Physical Activity	.09	.08	.07	.00	.23
Healthy Diet	.06	.05	.09	.01	.19
Safety Habits	.10	.42	.09	.00	.14

* $p < .05$

Group Differences: Moderating Effects Models

Gender differences in health promotion related to SWB. A regression model including gender was conducted to assess gender differences in SWB after controlling for health behaviors. Beta weights and squared semi-partial correlation coefficients for the main effects and moderating effects model are presented in Table 5 below. The main effects model containing these six variables accounted for approximately 15% of the observed variance in SWB, $F(6, 240) = 7.04, p < .05, R^2 = .15$. Gender did not uniquely

predict SWB after adjusting for health behaviors.

Table 5

Moderating Effects of Gender on Health-Promoting Behaviors Predicting SWB

	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Attitudes toward Substance Use	-1.56	.36	-.28*	<.0001	-1.09	.71	-.19	.06
Sleep	.37	.23	.13	.10	.19	.37	.06	.24
Physical Activity	.09	.08	.07	.27	.24	.13	.19	.08
Healthy Diet	.06	.05	.09	.19	.19	.09	.24*	.04
Safety Habits	.10	.42	.09	.21	.40	.56	.13	.11
Gender	-.05	.27	-.02	.82	3.39	2.23	.75	.09
Gender*Attitudes toward Substance Use					-.50	.95	-.08	.58
Gender*Sleep					-.07	.52	-.07	.79
Gender*Phys Activity					-.18	.19	-.18	.34
Gender*Healthy Diet					-.23	.13	-.36	.07
Gender*Safety Habits					-.46	.73	-.17	.47
<i>R</i> ²		.15				.18		
<i>F</i> for change in <i>R</i> ²						7.45		

**p* < .05

Next, to determine if the interactions of gender with each of the five health-promoting behaviors accounted for additional variance in SWB above and beyond that of health-promoting behaviors alone, a model including interaction vectors of gender and the five health behaviors was conducted. When interaction vectors were included, the model accounted an additional 3% of the variance in SWB ($F [11, 158] = 3.152, p < .05, R^2 = .18$). This change in R^2 was not significant ($F [5, 234] = 7.45, p > .05$). In the

moderating effects model, only healthy diet was independently related to differences in SWB ($\beta = .24^*$). However, none of the gender interaction vectors were unique predictors of SWB after controlling for shared variance.

Racial differences in health promotion related to SWB. Descriptive analyses indicated that a large majority of participants in the sample were of a White racial background (82.6%). Due to the small number of participants across other racial categories, race was collapsed into two categories of ‘White’ and ‘Non-white’ prior to this analysis.

First, a regression model was conducted to assess racial differences in SWB after controlling for health behaviors. Race did not uniquely predict SWB. The main effects model including race accounted for approximately 15% of the observed variance in SWB, ($F [6, 240] = 7.34, p < .05, R^2 = .15$). To determine whether the interactions of race with health-promoting behaviors accounted for additional variance in SWB, another regression model was conducted that included these interaction terms as predictors. No moderating effects by race occurred. The change in change in R^2 was not significant ($F [5, 234] = 2.20, p > .05$). Results are displayed in Table 6.

Table 6

Moderating Effects of Race on Health-Promoting Behaviors Predicting SWB

	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Attitudes toward Substance Use	-1.58	.36	-.28*	<.0001	-1.45	.41	-.25*	<.0001
Sleep	.37	.23	.09	.19	.34	.26	.18	.08
Physical Activity	.09	.08	.08	.21	.08	.09	.07	.19
Healthy Diet	.06	.05	.09	.19	.06	.05	.08	.19
Safety Habits	.07	.42	.09	.21	.08	.44	-.13	.11
Race	.43	.35	.08	.22	1.23	3.98	.16	.71
Race*Attitudes toward Substance Use					1.56	4.15	.06	.66
Race*Sleep					-.12	.90	-.06	.79
Race*Physical Activity					.21	.46	.11	.64
Race*Healthy Diet					.04	.32	.05	.83
Race*Safety Habits					-.76	1.12	-.26	.46
<i>R</i> ²		.15				.15		
<i>F</i> for change in <i>R</i> ²						2.20		

**p* < .05*Socioeconomic status (SES) differences in health promotion related to SWB.*

Similar regression analyses were conducted to assess moderating effects of SES, first with a main effects model including SES and then with the interaction term of SES and health-promoting behaviors; results are displayed in Table 7. SES did not uniquely predict SWB in the main effects model. Together, the six variables explained 15% of the shared variance in SWB, ($F [6, 240] = 7.30, p < .05, R^2 = .15$).

Table 7

Moderating Effects of Socioeconomic Status (SES) on Health-Promoting Behaviors Predicting SWB

	<i>B</i>	<i>SE B</i>	β	<i>p</i>	<i>B</i>	<i>SE B</i>	β	<i>p</i>
Attitudes toward Substance Use	-1.51	.37	-.27*	<.0001	-1.49	.65	-.21*	<.0001
Sleep	.39	.22	.14	.08	.17	.40	.07	.20
Physical Activity	.09	.08	.08	.21	.19	.14	.17	.08
Healthy Diet	.06	.05	.09	.17	.01	.08	.03	.34
Safety Habits	.10	.42	.09	.20	.28	.65	.13	.10
SES	.30	.28	.07	.22	-.76	2.68	.27	.79
SES*Attitudes toward Substance Use					.40	1.14	.07	.80
SES*Sleep					.38	.61	.19	.62
SES*Physical Activity					-.11	.20	-.12	.71
SES*Healthy Diet					.16	.14	.25	.50
SES*Safety Habits					-.28	.76	.26	.48
<i>R</i> ²		.15				.16		
<i>F</i> for change in <i>R</i> ²						2.78		

**p* < .05

Only an additional one percent of the variance in SWB was explained in a subsequent model including five SES-healthy behavior interaction vectors, ($F[11, 157] = 2.72, p < .05, R^2 = .16$). A test of the change in R^2 indicated that this difference was not significant ($F [5, 234] = , p > .05$). Attitudes toward substance use was the only variable independently related to differences in SWB after accounting for shared variance among all variables and interaction vectors ($\beta = -.21$). A review of the standardized beta

weights indicated that no moderating effects by SES occurred.

In summary, two health-promoting behaviors were significantly correlated with SWB in the current study. Increased amount of sleep per night was linked to higher SWB, while attitudes toward substance use (i.e., beliefs that using substances had positive consequences) were negatively correlated with youth's SWB. A significant percentage of the variance in SWB (15%) was accounted for by the linear combination of health-promoting behaviors, although only one of the five health promoting behaviors (i.e., attitudes toward substance use) was a unique predictor of SWB. In addition, none of the interaction terms of gender, race, and SES with health-promoting behaviors were significant predictors of SWB, indicating that moderating effects were not found for this sample.

CHAPTER 5 DISCUSSION

Summary of the Study

The purpose of the current investigation was to determine the degree to which health-promoting behaviors related to the mental well-being of early adolescents. In addition, this study provided the first examination of how gender, race, and SES impacted the relationship between SWB and health-promoting variables among a general population of youth. This chapter will summarize results of the current study and specifically address notable findings and how these compare with previous research. In addition, this chapter will discuss the implications of the results for practitioners, identify limitations of the study, and provide suggestions for future research.

Examination of Results

Participants' report of subjective well-being. Overall, students in the current sample reported positive appraisals of their life. For global life satisfaction, one of the three components of SWB, the sample's mean of 4.08 (corresponding to *mildly agree* with statements such as 'I have a good life') aligns with the notion that most studies find youth to report life satisfaction above the neutral range (Huebner et al., 2006). Following criteria for which researchers have dichotomized life satisfaction as 'low' vs. 'high' using 4.0 as a cut-point (Suldo & Huebner, 2004), the current sample, on average, reported 'high' life satisfaction. Participants' reports of how frequently they experienced positive

affect and negative affect, on average, also align with previous studies conducted with early adolescents (Suldo & Shaffer, 2008).

Participants' report of health-related behaviors. Participants reported on three healthy behaviors (diet, physical activity, sleep) for which various health organizations provide guidelines. The degree to which participants' responses align with recommended guidelines is summarized here to provide a reference for further discussion.

In regard to healthy diet, participants reported eating higher amounts of healthy food choices than what is outlined by the USDA My Pyramid Food Guidance System (USDA, 2005). An average consumption of 6.43 daily servings of fruits and vegetables combined was found for this sample of early adolescents, contrasted with the recommended five daily servings for children aged 9-13 (USDA My Pyramid Food Guidance System (USDA, 2005)). Days spent per week engaging in some type of physical activity ranged from 0-7, with a mean of 3.73 days. This is below the USDA recommendations for 30 minutes daily of moderate to vigorous activity. Previous research has demonstrated that female adolescents engage in physical activity less frequently than males (Dowda et al., 2001; Pate et al., 2000); the over-representation of females in the current sample may be one potential reason for these findings. Participants reported spending 3.5 hours per day on average in sedentary activity. This aligns with recent national survey findings that youth ages 11-16 spend an average of 28 hours per week (or 4 hours per day) in front of a television or computer screen (McDunough, 2009). Over 60% of the sample reported getting 7-8 hours of sleep per night, slightly less than the guideline of 8.5-9.25 hours per night for teens ages 10-17 (National Sleep Foundation, 2011). Sleep-wake cycle varied significantly from weekday to weekend.

Notable findings regarding intercorrelations between variables. Based on previous findings with adolescent samples, it was hypothesized that each of the five health-related behaviors assessed in the current study would have significant, positive correlations with the SWB of early adolescents. Of the five health-promoting behaviors assessed, average amount of sleep and attitudes toward substance use were the only two significantly linked to participant's subjective well-being. Attitudes towards substance use had the strongest correlation with SWB. One aspect of actual substance use, smoking, was also significantly linked to happiness, a component of SWB, in a previous examination with Hungarian adolescents (Piko, 2006). Notably, this was the only component of the five healthy habits assessed tapping appraisals or opinions vs. behavior, based on guidelines from previous research with early adolescents (Kovach Clark et al., 2010). Specifically, participants rate their level of agreement with statements such as 'smoking cigarettes helps you get away from your problems'. The other four health behaviors were assessed as the frequency, amounts, or time spent engaging in a behavior. One potential reason for attitudes toward substance use having the strongest relationship with SWB is that both of these constructs were assessed via subjective appraisals or opinions vs. subjective reports of behavior. Total hours of sleep was moderately correlated with SWB, such that a greater average amount of sleep per night was related to higher levels of SWB. Although this is intuitive, comparisons to previous research cannot be drawn as the current study provides the first examination of this link among adolescents.

The finding that diet and physical activity did not correlate significantly with SWB is inconsistent with the three previous studies conducted thus far specifically

examining health-promoting behaviors and SWB in youth (Holder et al., 2009; Lindberg & Swanberg, 2006; Piko, 2006). Significant, positive relationships between diet or physical activity and mental wellness were found by these researchers. For instance, Lindberg and Swanberg found that among a sample of international youth, eating habits were a significant predictor of students' well-being. Eating habits were operationalized similarly across the two studies (i.e., as a diet including fruits and vegetables and healthy snacks in the international sample), but differences in results may be attributed to assessment of SWB varying considerably across studies. Specifically, SWB was measured via a very broad one-item indicator, "How are you these days?" by Lindberg and Swanberg. Active physical leisure was positively correlated with children's happiness in a sample of 8-12 year olds (Holder et al.) but not in the current sample. However, Holder and colleagues found that the degree to which participants viewed physical activity as important to their health had the strongest link to happiness. In fact, this relationship was stronger than that of happiness and actual hours spent engaging in physical activity. Cognitive appraisals seem to play a key role in healthy behavior related to SWB; this is examined in more detail in the discussion of moderating effects below. Finally, the nonsignificant correlation between safety habits and SWB in the current study is consistent with the one previous examination of this relationship (Lindberg & Swanberg), although measurement differed across these samples. This may be because safety habits in general are viewed more as an adult-enforced *rule* vs. a healthy behavior. For example, while many children may be provided with guidelines regarding diet choices, sleep, physical activity from their caregivers, safety habits, particularly wearing a seatbelt in a vehicle and a helmet while riding a bicycle, seem to

be more universally enforced for children. Thus, if this construct is perceived as a *rule* vs. a *healthy behavior choice* in youth, relationships to their overall happiness, or more specifically, to SWB, may not be seen.

Interestingly, all five health-promoting behaviors were significantly correlated with positive affect, one of the three components of SWB. Differences in time frame guidelines for the affect measure (i.e., past few weeks) vs. the life satisfaction measure i.e., *past several weeks*) could be one contributing factor to this discrepancy, although these same significant links were not evidenced for negative affect. Recent findings from the adult literature base may provide some rationale for this distinction. Increased physical activity has been linked to boosts in positive mood states (e.g., cheerfulness) among older adults (Sarid et al., 2010). In addition, Shaffer-Hudkins and colleagues (2010) found that among all three components of SWB, positive affect was the strongest predictor of physical health perceptions among middle school students. A relationship between physical activity and decreases in depressed mood was not evidenced in Sarid and colleague's research, similar to the nonsignificant links with negative affect in the current study. Accordingly, while adolescents may experience a boost in their day to day positive emotional state (i.e., feeling *happy, strong, energetic*, etc.) when engaging in a healthier lifestyle, a more extended impact to their overall subjective appraisal of life was not seen.

Many of the intercorrelations among the five health-promoting variables were not significant and since this is the first examination of five behaviors concurrently, comparisons with previous research are limited. In the current study, physical activity was related to diet and sleep, but not safety habits or substance use. Pate and colleagues

(1996) found inter-relatedness between physical activity and three other behaviors (diet, substance use, and seatbelt use) among a sample of over 11,000 high school students. Differences may be explained by variation in how constructs were operationalized between the studies (i.e., attitudes vs. actual substance use and four safety items vs. seatbelt use only) as well as age groups utilized (i.e., middle vs. high school students).

Notable findings regarding prediction of SWB by health-promoting variables. It was also hypothesized in the current study that healthy behaviors would significantly predict SWB. Together, health-promoting behaviors accounted for 15% of the shared variance in SWB. This is a lower amount of variance than Levy found in her research of young adults' SWB (28%); however, both health-compromising and health-promoting behaviors, for a total of eight predictor variables, were included in that analysis. Previous studies of SWB or related wellness constructs and health behaviors in youth have focused the most on diet and exercise and collectively, findings suggest that these two health behaviors may have the strongest unique contributions to SWB (Holder et al., 2009; Klein-Hessling et al., 2005). However, for the current sample, only attitudes toward substance use was a unique predictor of mental wellness after controlling for shared variance. Other health-related behaviors were not significant predictors. No other researchers have examined attitudes toward substance use and SWB in youth, but Piko (2006) found that actual smoking had a significant negative contribution to adolescents' life satisfaction, which coincides with the current study. However, diet was also a unique predictor of life satisfaction among the Hungarian adolescents in Piko's sample. Measurement differences of diet may contribute to observed discrepancies across studies. The degree to which participants are able to accurately recall their health habits may also

play a role in the lack of significant findings with the current sample. While the measures that were used have established reliability for previous samples of middle school students, different methods for reporting such behaviors, including caregiver report or a diary or log across time of sleep, dietary intake, and physical activity, may yield more accurate recall (Troost, 2007).

Notable findings regarding moderating effects of gender, race, and SES.

Numerous studies have highlighted differences between gender, ethnic group, and SES in regard to health-related behaviors (Pate, Trost, Levin, & Dowda, 2000; Spear & Kulbok, 2001; Wu, Rose, & Bancroft, 2006). Accordingly, the hypothesis for the current study was that these demographic differences would serve as moderators in the health behavior/SWB relationship. However, none of the three demographic variables demonstrated moderating effects in the current study. Of note, SWB is a construct that remains much more stable than health behaviors across gender, race, and socioeconomic status (SES) groups in previous studies, although many of the samples studied have been limited to African-American and Caucasian youth (Huebner, Suldo, & Gilman, 2006). This stability of SWB across groups may also play a role in the finding that no moderating effects occurred.

Given the lack of significant findings here, results from the main effects model are more substantiated. Specifically, healthy behaviors accounted for 15% of the shared variance in SWB, even when considering potential moderating effects of three separate demographic characteristics. In addition, attitudes toward substance use was a unique, significant predictor of SWB across gender, race, and SES groups.

It is also important to consider that other factors may play a significant role in determining how one's happiness relates to healthy lifestyle. Previous research demonstrates that health-promoting behavior is difficult to fully understand without also examining the cognitive and social factors that contribute to engaging in these activities (Pender et al., 2005). Contributing cognitive factors to healthy behaviors include self-efficacy, or the belief in one's abilities to engage in health-promoting activities, and its viewed importance. For instance, self-efficacy for exercising and beliefs about the important of exercise accounted for approximately 19% of the variance in physical activity behaviors among a sample of adolescents (Garcia et al., 1995). Moreover, among adults, self-efficacy for physical activity and satisfaction with the type of activity did indeed moderate prediction of SWB (Rejeski et al., 2001). Perhaps for the subset of individuals who believe physical activity or any other healthy behavior is important, a healthy lifestyle would predict SWB. Assessment of such moderating effects in youth is still needed. In addition, social factors may play a moderating role if individuals in a child or adolescent's life are engaging in healthy behaviors or send strong messages that this is important. When a sample of older adults received more social support from peers in regard to participating in physical activity, boosts in both their frequency of physical activity and their subjective well-being were evidenced (McAuley et al., 2000). Considering the high importance of peers and social factors during adolescent development, these same relationships may be evidenced, but further examination is required.

Implications of Results for Practitioners

An increasingly strong focus on health promotion, particularly in regard to eating and activity habits, has occurred in the past few years in an effort to combat obesity among youth (Harris et al., 2005). Past research has also demonstrated that children with poorer health habits have higher rates of absenteeism from school (Vetiska et al., 2000). Moreover, health behaviors also predicted a significant portion of subjective well-being among the adolescents in the current study. Given this collective knowledge, practitioners should emphasize the need for healthy behavior in their work with adolescents, both for a physical health and mental health benefit.

At a universal or prevention level, health promotion for youth in schools and community settings may include a specific focus on educating against substance, given findings from the current study. Many national campaigns educate children and early adolescents on the physical health risks of using drugs, tobacco, or alcohol (National Institute on Drug Abuse, 2010). Current findings build an even stronger case for teens to refrain from substance use, given that positive attitudes toward using substances (i.e., beliefs that using substances had positive consequences) predicted decreased subjective well-being. Practitioners can emphasize both the physical and mental health risks to youth as part of group-level education. In school settings, support staff including school psychologists serve a role as student advocates, concerned not just with academic success but also children's physical, social, and emotional well-being. These professionals can advocate for a systems-level focus on health promotion, where students not only learn about health-promoting behaviors but also have opportunities to engage in these behaviors at school, particularly with school meals and physical activity times. Based on

current findings, a similar message about how health habits relate to mental wellness can be presented across gender, race, and SES groups.

At a more targeted level, finding ways to promote health and activity may be necessary for specific groups of students. For instance, in the current study, a little over half of students were not enrolled in physical education class. School personnel can advocate for ways to integrate physical activity into hands-on classroom learning for these students in particular.

Finally, individualized health promotion may be warranted for students with high levels of absenteeism, given the known relationship between low school attendance and poor health habits (Vetiska et al., 2000). For these adolescents, partnership with parents and caregivers to promote healthy behaviors is critical. Although early adolescence (i.e., 6th to 8th grade) represents a period in development where children are typically given more autonomy with decision-making about their health habits (Mullan Harris et al, 2005), parents likely still play a key role in dietary habits (e.g., purchasing food selections and preparing meals outside of school), safety guidelines when their child can be monitored more easily (e.g., riding in the car vs. riding their bicycle), and bedtime, even if this does not indicate what time the child actually falls asleep.

School psychologists also have the training background to collect data either at a group or individual level to assess a need for specific health programming with the population they serve, as well as monitor the outcomes of such efforts. Brief measures of SWB, such as the seven-item global life satisfaction scale utilized in the current study can be used with larger groups, while more comprehensive measures can be used with targeted students. Health-promoting behaviors can be assessed via student self-report at a

group level as well, similar to assessments used in this study. However, when working with individual students for which parent report may be more feasible, caregivers may also be asked to assess health habits to address any social desirability responding by the student.

Limitations of the Current Study

Although several precautions were taken in the current study to address potential limitations and threats to validity, not all factors could be controlled. Ecological validity is the ability of the researcher to generalize the results of a study across setting (Johnson & Christensen, 2004). Violations to ecological validity include the tendency of the researcher to draw erroneous conclusions to populations with different settings than the sample utilized. The student population was chosen due to familiarity of the researcher with the administrative personnel at the site and their willingness to partner for this study. Unique characteristics of this sample may limit the extent to which results can be generalized across settings. Two characteristics to note are that this student population does not represent larger US Census Data in regard to racial distribution and the school site is located in a geographically suburban-rural area. Therefore, results cannot be generalized to areas with youth from more diverse racial backgrounds or youth living in inner-city areas.

Threats to population validity can occur when researchers generalize results from the sample under study to a larger population, if these groups differ (Johnson & Christensen, 2004). A convenience sampling method was employed in the current study, and as a result, students at the school who agreed to participate quickly in the research study may have differed from students in the larger school population who declined to

participate. When descriptive statistics of study participants were compared to overall demographics of the school, females and seventh-grade students were largely overrepresented. In this regard, findings cannot be readily extended to the school population.

Another potential limitation of the current study relates to participants' responses from one measure utilized. Overall, research of safety habits in youth is limited in scope and lacks replication of findings. For the current study, items from two published studies were combined for a more comprehensive examination of this construct (Bennett et al., 2007; Lindberg & Swanberg, 2006). However, a large percentage of students (49%) did not respond to one or more safety habits questions because they indicated that they did not perform these activities (i.e., rollerblading, skateboarding, or bicycling). While the method of multiple imputation used to address the missing data is considered valid (Royston, 2004), this nevertheless relies on pooled estimates of the missing values. To determine the validity of this method, the researcher compared means for the predictor variables and outcome variable across both the original and imputed datasets and no significant differences were found.

Suggestions for Future Research

All variables assessed in the current study were gathered via self-report questionnaires. Due to the nature of SWB being a *subjective* appraisal of one's life, self-report is the indicated method for gathering this information. However, this may not be the case for each health-promoting behavior examined. For instance, although several items used to assess the sleep habits of youth in this study provided important descriptive information regarding sleep hygiene in the sample, only one item (i.e., total hours of

sleep) could be used for further predictive analyses. Many other sleep measures that comprehensively assess sleep hygiene rely on parent report after observing the child's sleeping behavior. To more comprehensively assess sleep hygiene, utilization of a smaller sample may allow for caregiver report on items from a sleep hygiene measure such as the BEARS (Owens & Dalzell, 2005) in future studies. Smaller sample size, although reducing power, may also allow for behavioral recordings of health habits such as food intake or physical activity. Trost (2007) advocates for the use of such objective measures, particularly when working with younger children (i.e., under 10 years of age) as they may demonstrate difficulty recalling behavior and estimating the correct time frame in which they engaged in activities. Many researchers to date have not employed such methods due to difficulty in administration and interpretability.

In addition to utilization of more objective measures of health-promoting behaviors, future research should also examine whether these health-promoting behaviors are linked to decreased psychopathology, or mental illness. Previous research has demonstrated that SWB and psychopathology are separate constructs of mental health, rather than on a continuum (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008). As such, this research would provide further insight into the mental-physical health link from a *behavioral* operationalization of physical health (i.e., health-promoting behaviors), rather than beliefs of one's physical health, as has been the case in most previous studies.

Although demographic characteristics did not seem to play a significant moderating role in the current sample, replication across geographically and racially diverse samples and with older adolescents is still an important first step to determine the generalizability of these findings. The current sample had a large representation of

White students and female students, limiting comparisons between racial and gender groups to this particular group of participants. In addition, examination of cognitive and social factors as moderators of the relationship between healthy lifestyle and happiness is warranted, given what previous literature has demonstrated.

Final Thoughts

This study was the first investigation that comprehensively examined the prediction of SWB by five health-promoting behaviors. The findings from this study call for the need to focus on educating students regarding substance use and how this may not only impact physical health but also mental wellness. Results also substantiate the link between positive affect, one component of SWB, and health-promoting behaviors, a finding that aligns with previous research of positive affect and physical health perceptions (Shaffer-Hudkins et al., 2010). However, practitioners should consider the somewhat limited generalizability of these findings given the limited racial diversity of the population from which the sample was drawn. Future research may also incorporate more objective measures of health-promoting behaviors with a particular focus on sleep, which was significantly correlated with SWB in the current study, by using a comprehensive sleep hygiene assessment via parent report with smaller samples in the future. Demographics did not serve as moderators in the current study. As stated, while replication of findings with a sample more reflective of US Census Data is needed, these results support the notion that the combination of health-promoting behaviors account for a significant portion of the shared variance in SWB across gender, race, and SES groups. Examination of the moderating role that cognitive and social factors play in the mental-physical health link among youth may also be warranted.

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APPENDICES

Appendix A
Health-Promoting Behaviors by Demographic Groups

Table A1
Health-Promoting Behaviors by Demographic Groups

Variable	Gender				Race				SES			
	Male		Female		White		Non-White		High		Low	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Attitudes toward Substance Use	.36	.35	.37	.40	.36	.39	.38	.36	.33	.36	.42	.41
Physical Activity	3.88	1.80	3.65	1.92	3.76	1.87	3.63	1.90	3.70	1.84	3.79	1.93
Healthy Diet	6.41	2.88	6.45	3.05	6.50	3.04	6.09	2.72	6.52	3.05	6.31	2.91
Safety Habits	2.47	.64	2.61	.62	2.52	.62	2.87	.65	2.56	.62	2.57	.64

*Note: Information for the categorical variable of sleep was excluded from this appendix.

Appendix B Parent Consent Form

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted at River Ridge Middle School by investigators from the University of South Florida. Our goal in conducting the study is to determine the relationship between students' health-related behaviors (i.e., diet, exercise, sleep, safety habits, and attitudes toward substance use) and their psychological wellness.

- ✓ Who We Are: The research team consists of Emily Shaffer-Hudkins, Ed.S., a doctoral student in the School Psychology Program at the University of South Florida (USF), supervised by Dr. Kathy Bradley-Klug, an Associate Professor in the USF College of Education. We are planning the study in cooperation with the principal of River Ridge Middle School (RRMS) to make sure that the study provides information that will be useful to the school.
- ✓ Why We Are Requesting Your Child's Participation: This study is being conducted as part of a project entitled, "Health-Promoting Behaviors and Subjective Well-Being among Early Adolescents." Your child is being asked to participate because he or she is enrolled as a full-time student at RRMS.
- ✓ Why Your Child Should Participate: We need to learn more about what leads to happiness and health during the pre-teen years. The information that we collect from students may help increase our overall awareness of the importance of monitoring students' happiness during adolescence. In addition, group-level results of the study will be shared with the teachers and administrators at RRMS in order to increase their knowledge of the relationship between specific healthy behaviors that can be promoted at home and school, and psychological wellness in students. Please note neither you nor your child will be paid for your child's participation in the study. However, the class in each grade level with the highest ratio of student participants will receive a breakfast party.
- ✓ What Participation Requires: If your child is given permission to participate in the study, he or she will be asked to complete several paper-and-pencil questionnaires. These surveys will ask about your child's thoughts, behaviors, and attitudes towards school, teachers, classmates, family, and life in general. The surveys will also ask about your child's physical health behaviors including diet, exercise, sleep, and safety habits. Completion is expected to take your child between 45 and 60 minutes. We will personally administer the questionnaires at RRMS, during regular school hours, to large groups of students who have parent permission to participate. Participation will occur during one class period this school year. We will also gather information about your child's ethnicity and eligibility for the free or reduced-cost school lunch program from the school's electronic record system.
- ✓ Please Note: Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this research

study or to withdraw him or her at any time. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with RRMS, USF, or any other party.

- ✓ Confidentiality of Your Child's Responses: There is minimal risk to your child for participating in this research. We will be present during administration of the questionnaires in order to provide assistance to your child if he or she has any questions or concerns. Additionally, school guidance counselors will be available to students in the unlikely event that your child becomes emotionally distressed while completing the measures. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel from this study and the USF Institutional Review Board and its staff may inspect the records from this research project, but your child's individual responses will not be shared with school system personnel or anyone other than us and our research assistants. Your child's completed questionnaires will be assigned a code number to protect the confidentiality of his or her responses. Only we will have access to the locked file cabinet stored at USF that will contain: 1) all records linking code numbers to participants' names, and 2) all information gathered from school records. All records from the study (completed surveys, information from school records) will be destroyed in five years.
- ✓ What We'll Do With Your Child's Responses: We plan to use the information from this study to inform educators and psychologists about the relationship between students' psychological wellness (particularly their subjective well-being, also referred to as happiness) and their health-related behaviors. The results of this study may be published. However, the data obtained from your child will be combined with data from other people in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.
- ✓ Questions? If you have any questions about this research study, please contact Emily Shaffer at (813) 396-9996. If you have questions about your child's rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-5638.
- ✓ Want Your Child to Participate? To permit your child to participate in this study, please complete the attached consent form and have your child turn it in to his or her English teacher.

Sincerely,

Emily Shaffer-Hudkins, Ed.S.
Doctoral Candidate in School Psychology
Department of Psychological and Social Foundations

Kathy L. Bradley-Klug, Ph.D.
Associate Professor and Coordinator
Graduate Programs in School Psychology
Department of Psychological and Social Foundations

Consent for Child to Take Part in this Research Study

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

Printed name of child

Grade level of child

Signature of parent
of child taking part in the study

Printed name of parent

Date

Statement of Person Obtaining Informed Consent

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

Signature of person
obtaining consent

Printed name of person
obtaining consent

Date

Estimado Padre de Familia/Guardián:

Esta carta provee información sobre un estudio investigativo que se realizara en River Ridge Middle School por investigadores de la Universidad del Sur de la Florida. El objetivo por el cual se realizara este estudio es para determinar entre los estudiantes la relación entre el comportamiento y la salud (eje., dieta, ejercicio, dormir, hábitos saludables) y su salud psicológica.

- ✓ Quienes somos: El equipo de investigación está conformado por Emily Shaffer-Hudkins, Ed.S., estudiante doctoral en el Programa de Psicología Escolar de la Universidad del Sur de la Florida (USF), supervisada por la Dr. Kathy Bradley-Klug, Profesor Asociado del Colegio de Educación USF. Planeamos el estudio con la cooperación del rector de River Ridge Middle School (RRMS) para asegurarnos que el estudio proporcione información que sea útil para la escuela.
- ✓ Porque estamos solicitando la participación de su hijo: Este estudio está siendo conducido como parte de un proyecto titulado “Comportamientos que Promueven Salud y Bienestar entre Preadolescentes.” Se la ha pedido a su hijo que participe en el estudio porque él o ella está matriculado como un estudiante de tiempo completo en RRMS.
- ✓ Por que debería participar su hijo: Queremos aprender más sobre lo que conduce a la felicidad y salud en la pre adolescencia. La información que se colecte por medio de los estudiantes puede ayudarnos a estar mas conscientes de lo importante que es supervisar la felicidad de los estudiantes durante la adolescencia. Además, los resultados serán compartidos con los maestros y administradores de RRMS con el propósito de aumentar su conocimiento específicamente entre comportamientos sanos que pueden ser promovidos tanto en la casa como en la escuela y la salud psicológica de los estudiantes. Por favor tenga presente que no se les pagara ni a usted ni a su niño por participar de este estudio. Sin embargo, todos los estudiantes que participen en el estudio harán parte de la rifa de una o varias tarjetas de regalo certificadas.
- ✓ Que se requiere para participar: Si su hijo tiene permiso para participar en el estudio, se le pedirá a él o ella completar varios cuestionarios. En estos cuestionarios se le preguntara a su hijo sobre sus pensamientos, comportamientos, su actitud sobre la escuela, maestros, compañeros de clase, familia, y de la vida en general. Los cuestionarios también preguntara a su hijo sobre su salud física incluyendo dieta, ejercicio, dormir, y hábitos de seguridad. Se espera que su hijo complete el cuestionario entre 45 y 60 minutos. Nosotros proveeremos personalmente los cuestionarios a RRMS, durante horas regulares de la escuela y a grupos grandes de estudiantes que tiene el permiso de los padres para participar.
La participación en el estudio ocurrirá durante una clase de este año escolar.
- ✓ Por favor tenga en cuenta: Decidir dar permiso para que su hijo participe en este estudio investigativo debe ser totalmente voluntario. Usted es libre de permitir que su hijo participe en este estudio investigativo o de retirarlo en cualquier momento. Su decisión de participar, no participar o retirarse del estudio en cualquier momento no afectara de ninguna forma el estatus del estudiante, sus notas, o su relación con RRMS, USF u otras partes.

- ✓ Confidencialidad de las Respuestas de su hijo: El riesgo es mínimo para su hijo al participar en esta investigación. Nosotros estaremos presentes en el momento en que se le administre el cuestionario a su hijo con el fin de asistirlo con ayuda si él o ella tienen alguna pregunta o preocupación. Además, los consejeros escolares estarán disponibles para los estudiantes en caso de que se sientan angustiados contestando el cuestionario. El personal de investigación autorizado de este estudio y el Comité de Examinador Institucional de USF y su personal pueden inspeccionar los archivos de esta investigación, pero las respuestas de su hijo no serán compartidas con el personal del sistema escolar o alguien diferente a nosotros o los asistentes en la investigación. Se le asignará un código a los cuestionarios que sean completados por su hijo para proteger la confidencialidad de sus respuestas. Únicamente nosotros tendremos acceso a las llaves del gabinete de archivos que se encuentra en USF que contendrá: 1) todos los archivos que se vinculen con el número del código del participante y 2) toda la información que se junto de los archivos escolares. Todos los archivos del estudio (cuestionarios, información obtenida por los archivos de la escuela) serán destruidos en cinco años.
- ✓ Lo que haremos con las respuestas de su hijo: Planeamos usar la información de este estudio para informar a los educadores y psicólogos sobre la relación entre la salud psicológica de los estudiantes (en particular su bienestar subjetivo, también conocido como felicidad) y sus comportamientos relacionados con la salud. Los resultados de este estudio pueden ser publicados. Sin embargo los datos obtenidos de su hijo serán combinados con datos de otras personas en esta publicación. En los resultados publicados no se incluirá el nombre de su hijo o cualquier otra información personal que pueda identificarlo.
- ✓ ¿Preguntas? Si usted tiene alguna pregunta sobre este estudio de investigación, por favor póngase en contacto con Emily Shaffer en el (813) 396-9996. Si usted tiene preguntas sobre los derechos de su hijo como persona participante de un estudio de investigación, usted puede comunicarse con un miembro de la División de Rendimiento Investigativo de USF al (813) 974-5638.
- ✓ ¿Quiere que su hijo participe? Para dar consentimiento de que su hijo participe en este estudio, por favor complete la forma de consentimiento adjunta y que su hijo la regrese a su maestro.

Atentamente,

Emily Shaffer-Hudkins, Ed.S.
 Doctoral Candidate in School Psychology
 Department of Psychological and Social Foundations

Kathy L. Bradley-Klug, Ph.D.
 Associate Professor and Coordinator
 Graduate Programs in School Psychology
 Department of Psychological and Social Foundations

Consentimiento para Participar en este Estudio de Investigación

Doy permiso para dejar que mi hijo participe en este estudio. Entiendo que esto es una investigación.

He recibido una copia de esta carta y del consentimiento para mis archivos.

Nombre impreso del niño

Año escolar del niño

Firma del padre
del niño participante del estudio

Nombre impreso del padre

Fecha

Declaración de la Persona que Obtiene el Consentimiento Informado

Certifico que los participantes han recibido el consentimiento informado el cual ha sido aprobado por el Comité Examinador de la Universidad del Sur de la Florida y que explica la naturaleza, demandas, riesgos y beneficios que implica participar en este estudio. Certifico que un número telefónico ha sido proporcionado en caso de preguntas.

Firma de la persona
que obtiene el consentimiento

Nombre impreso de la persona
que obtiene el consentimiento

Fecha

Appendix C Student Assent Form

Hello!

Today you will be asked to participate in a research study by filling out several surveys. Our goal in doing this study is to find out the effect of students' health habits on their mental wellness.

Why am I being asked to take part in this research?

You are being asked to take part because you attend River Ridge Middle School (RRMS).

Who is doing this study?

The person in charge of this study is Emily Shaffer-Hudkins, Ed.S. She is being guided in this research by Kathy Bradley-Klug, Ph.D. Other people who you may see while you are on the study include graduate student members of the USF research team assisting Emily Shaffer today. We are working with your principal to make sure this study will be helpful to your school.

What is the purpose of this study?

By doing this study, we hope to learn more about what leads to happiness and health during the pre-teen years. The information that we collect may help us better understand why we should monitor student's healthy behaviors and happiness.

Where is the study going to take place and how long will it last?

The study will be take place at River Ridge Middle School. You will be asked to participate in one visit which will take about 45-60 minutes. This is the total amount of time you will be asked to volunteer for this study.

What will I 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 attitudes toward substance use.

Do I have to take part in this study?

Your involvement in this study is voluntary (your choice). By signing this form, you are agreeing to take part 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.

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.

Will I receive any compensation for taking part in this study?

You will not receive any compensation for taking part in this study.

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.

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. If you think of other questions later, you can ask them. Also, you may contact us later at (813) 396-9996 (Emily Shaffer-Hudkins).

Thank you for taking the time to take part in this study.

Sincerely,

Emily Shaffer-Hudkins, Ed.S.
Doctoral Candidate in School Psychology
Department of Psychological and Social Foundations

Kathy L. Bradley-Klug, Ph.D.
Associate Professor and Coordinator
Graduate Programs in School Psychology
Department of Psychological and Social Foundations

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 received a copy of this letter and assent form.

Name of person agreeing to take part in the study

Date

Signature of person agreeing to take part in the study

Name of person providing information (assent) to subject

Date

Appendix D
Demographics Form

ID # _____ Spring 2011

PLEASE READ EACH QUESTION AND CIRCLE ONE ANSWER PER QUESTION:








1. I am in grade: 6 7 8
2. My gender is: Male Female

Sample Questions:

	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. I go to the beach	1	2	3	4	5

	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
2. Going to the beach is fun	1	2	3	4	5

For the next question, use the following pictures to help you estimate the number of servings eaten.

 Whole tennis ball	 ½ tennis ball	 Two Dice	 Golf ball
 1 Nutri-Grain bar	 1 slice of bread	 1 deck of cards	

Servings per day

3. How many servings of dog food would a medium-sized dog eat each day if 1 serving = size of a whole tennis ball?

- 0 4
- 1 5
- 2 6
- 3 7

Appendix E
Students' Life Satisfaction Scale (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	Mostly Disagree	Mildly Disagree	Mildly Agree	Mostly Agree	Strongly Agree
1. My life is going well	1	2	3	4	5	6
2. My life is just right	1	2	3	4	5	6
3. I would like to change many things in my life	1	2	3	4	5	6
4. I wish I had a different kind of life	1	2	3	4	5	6
5. I have a good life	1	2	3	4	5	6
6. I have what I want in life	1	2	3	4	5	6
7. My life is better than most kids'	1	2	3	4	5	6








Appendix F
Positive and Negative Affect Scale for Children (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

Appendix G
Nutrition and Exercise Survey for Students (Curtiss, 2005)

For the next questions, use the following pictures to help you estimate the number of servings eaten from each food group.

 Whole tennis ball	 ½ tennis ball	 Two Dice	 Golf ball
 1 Nutri-Grain bar	 1 slice of bread	 1 deck of cards	

How many total servings from the following food groups do you think you eat or drink each day? Please circle **one** number from the right-hand column.

Vegetables		SERVINGS PER DAY (circle one)
<p>Uncooked 1 serving = size of <u>whole tennis ball</u></p> <ul style="list-style-type: none"> • Salad or lettuce • Carrots • Broccoli, cauliflower • Celery, onions • Peppers • Tomatoes 	<p>Cooked 1 serving = size of <u>½ tennis ball</u></p> <ul style="list-style-type: none"> • Potatoes, corn, vegetable soup • Any canned vegetable • Broccoli, cauliflower, carrots, squash • Asparagus, collard greens • Salsa, tomato sauce • Yucca, plantains or any other vegetable 	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>
Fruit and fruit juice		
<p>Fresh/raw fruit 1 serving = size of <u>whole tennis ball</u></p> <ul style="list-style-type: none"> • Apple, banana, peach, plum, pear, mango, tangerine, orange, grapes, papaya, cherries, raspberries, blueberries, watermelon, or any other fresh fruit <p>Canned fruit 1 serving = size of <u>½ tennis ball</u></p> <ul style="list-style-type: none"> • Applesauce, peaches, pears, pineapple, fruit cocktail 	<p>Dried fruit 1 serving = size of <u>golf ball</u></p> <ul style="list-style-type: none"> • Apricots, prunes • Raisins, cranberries, Craisins <p>Fruit juice 1 serving = size of <u>½ tennis ball</u></p> <ul style="list-style-type: none"> • 100% fruit juice (apple, grape, orange, tomato, grapefruit, mango, papaya, etc.) <p><i>*Does not include Hawaiian Fruit Punch, Gatorade, lemonade, or Hi-C, CapriSun, Kool-Aid, fruit flavored soda (grape, orange strawberry) – these are ‘Other’ items</i></p>	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>

Milk and milk products		
<p>Liquids</p> <p>1 serving = size of <u>whole tennis ball</u></p> <ul style="list-style-type: none"> Milk, soy milk (including chocolate milk, but not Yoo-Hoo) 	<p>Cheese</p> <p>1 serving = size of <u>one slice of bread</u></p> <ul style="list-style-type: none"> 1 Kraft single slice of cheese 1 string of cheese (size of index finger) 	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>
<p>Solids</p> <p>1 serving = size of <u>½ tennis ball</u></p> <ul style="list-style-type: none"> Yogurt Cottage Cheese 	<p>1 serving = size of <u>golf ball</u></p> <ul style="list-style-type: none"> Crumbled/grated/shredded cheese <p>1 serving = size of <u>4 dice</u></p> <ul style="list-style-type: none"> 1 cube of cheese 	
Meat and beans		
<p>Meats</p> <p>1 serving = size of <u>deck of cards</u></p> <ul style="list-style-type: none"> Hamburger patty, ground beef, steak Hot dog Chicken, including chicken nuggets Fish, tuna fish, or seafood Porkchop, ham Any deli meat or tofu/soy 	<p>Beans</p> <p>1 serving = size of <u>½ tennis ball</u></p> <ul style="list-style-type: none"> Red, black, and white beans Pinto and lima beans <p>Eggs</p> <p>1 serving = size of <u>1 egg</u></p> <p>Nuts</p> <p>1 serving = size of <u>golf ball</u></p> <ul style="list-style-type: none"> Peanut butter Nuts 	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>
Breads and grains		
<p>Breads</p> <p>1 serving = size of <u>slice of bread</u></p> <ul style="list-style-type: none"> Bread, frozen waffle or pancake Pizza crust <p>Cereal</p> <p>1 serving = size of <u>whole tennis ball</u></p> <ul style="list-style-type: none"> Cereal or oatmeal <p>Bagels</p> <p>1 serving = ½ bagel</p>	<p>Pastas/rice</p> <p>1 serving = size of <u>½ tennis ball</u></p> <p>Crackers</p> <p>1 serving = size of <u>whole tennis ball</u></p> <p>Popcorn</p> <p>1 serving = size of <u>3 whole tennis balls</u></p> <p>Breakfast bars</p> <p>1 serving = 1 bar</p>	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>
Other foods		
<p>1 serving = 1 of the following:</p> <ul style="list-style-type: none"> 1 can of soda, 1 can size of the following: Hawaiian Fruit Punch, Gatorade, lemonade, or Hi-C, CapriSun, Kool-Aid, fruit flavored soda (grape, orange strawberry) <p>Popcorn/corn snacks</p> <p>1 serving = size of <u>whole tennis ball</u></p> <ul style="list-style-type: none"> French fries, tator tots, chips 	<p>Candies</p> <p>1 serving = size of <u>golf ball</u></p> <ul style="list-style-type: none"> Twizzlers, Skittles, Gummy bears, hard candy, M & M's, or others <p>Cookies/Ice Cream</p> <p>1 serving = size of <u>½ tennis ball</u></p>	<p>0 4</p> <p>1 5</p> <p>2 6</p> <p>3 7</p>

Part II. Physical Activity: The following questions are about physical activity. Circle only one answer for each question.

1. **On how many of the past 7 days did you do any type of exercise/physical activity for 20 minutes without stopping or longer?**

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
--------	-------	--------	--------	--------	--------	--------	--------

2. **On how many of the past 7 days did you exercise/participate in physical activities for at least 20 minutes without stopping that made you breathe hard, such as basketball, jogging, swimming laps, tennis, fast walking, fast bicycling or similar aerobic activities?**

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
--------	-------	--------	--------	--------	--------	--------	--------

3. **On how many of the past 7 days did you participate in exercise/physical activity for at least 30 minutes without stopping that did not make you breathe hard, such as brisk walking, slow bicycling, skating, pushing a lawn mower, or mopping floors?**

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
--------	-------	--------	--------	--------	--------	--------	--------

4. **On how many of the past 7 days did you participate in exercise/physical activity to strengthen or tone your muscles, such as push-ups, sit-ups, weight lifting, yoga, pilates, or martial arts?**

0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
--------	-------	--------	--------	--------	--------	--------	--------

5. **In an average week when you are in school (Monday-Friday), on how many days do you go to physical education (PE) classes?**

0 days	1 day	2 days	3 days	4 days	5 days
--------	-------	--------	--------	--------	--------

6. **During an average physical education (PE) class, how many minutes do you spend actually exercising or playing sports?**

I do not take PE	Less than 10 minutes	10 to 20 minutes	21 to 30 minutes	More than 30 minutes
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7. **In an average school day (Monday-Friday), how many hours do you spend doing any of the following activities: watching television/movies, playing video games, reading, homework, talking or text messaging on the phone, or on the computer/Internet?**

0 (No time)	Less than 1 hour per day	More than 1 hour and less than 2 hours per day	More than 2 hours and less than 3 hours per day	More than 3 hours and less than 4 hours per day	More than 4 hours and less than 5 hours per day	5 or more hours per day
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Appendix H
Sleep and Safety Habits Questionnaire

How many hours of sleep do you usually get?				
Less than 7 hours	7-8 hours	9 hours	10+ hours	
What time do you usually go to bed on <i>school nights</i> ? (i.e., Sunday through Thursday night)				
Before 9:00 PM	9:00-9:59 PM	10:00–10:59 PM	11:00 – 11:59 PM	After 12:00 AM
What time do you usually wake up on <i>school days</i> ? (i.e., Monday through Friday morning)				
Before 6:00 AM	6:00 – 6:59 AM	7:00 AM – 7:59 AM	8:00 – 8:59 AM	After 9:00 AM
What time do you usually go to bed on <i>weekends</i> ? (i.e., Friday and Saturday night)				
Before 10:00 PM	10:00–10:59 PM	11:00 – 11:59 PM	After 12:00 AM	
What time do you usually wake up on <i>weekends</i> ? (i.e., Saturday and Sunday morning)				
Before 6:00 AM	6:00 - 7:00 AM	7:00 AM – 8:00 AM	After 8:00 AM	
How often do you wear a helmet when you ride a bicycle?				
0 I do not ride a bicycle	1 Never	2 Rarely	3 Sometimes	4 Most of the Time
How often do you wear a helmet when you are rollerblading or skateboarding?				
0 I do not rollerblade or skateboard	1 Never	2 Rarely	3 Sometimes	4 Most of the Time
How often do you wear a seatbelt when you are riding in a car?				
	1 Never	2 Rarely	3 Sometimes	4 Most of the Time
Have you ever ridden in a car driven by someone who had been drinking alcohol?				
	Yes	No	Not Sure	

Appendix I
Attitudes toward Substance Use

Here is a list of things kids your age have said about smoking cigarettes. How strongly do you agree or disagree with each statement? (Circle ONE number for each statement)

Smoking cigarettes relaxes you.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Smoking cigarettes makes you do poorly in sports.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Smoking cigarettes gets you into trouble at school.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Smoking cigarettes helps you get away from your problems.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Smoking cigarettes makes other people not want to be around you.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Smoking cigarettes helps you stay thin.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>

Here are some things kids your age have said about drinking alcohol. How strongly do you agree or disagree with each statement. (Circle ONE number for each statement)

Drinking alcohol relaxes you.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Drinking alcohol makes you do poorly in sports.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Drinking alcohol lets you have more fun.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Drinking alcohol gets you into trouble.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Drinking alcohol helps you get away from your problems.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>
Drinking alcohol slows down your reaction time.			
0	1	2	3
<i>Strongly Disagree</i>	<i>Sort of Disagree</i>	<i>Sort of Agree</i>	<i>Strongly Agree</i>

Here are some things kids your age have said about using marijuana. How strongly do you agree or disagree with each statement? (Circle ONE number for each statement)

Using marijuana relaxes you.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>
Using marijuana makes it hard to remember things.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>
Using marijuana lets you have more fun.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>
Using marijuana makes you do poorly in school.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>
Using marijuana helps you get away from your problems.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>
Using marijuana makes you do things you might regret.			
0 <i>Strongly Disagree</i>	1 <i>Sort of Disagree</i>	2 <i>Sort of Agree</i>	3 <i>Strongly Agree</i>