

Can Health Behaviors and Motives Predict College Students' Self-Esteem?

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A sample of 268 college students completed a 98-item questionnaire that surveyed their knowledge of eating and exercise recommendations, their eating and exercise motives and behaviors, and their self-esteem. A regression analysis using a forward method of entry was used to investigate whether certain food choice motives, exercise motives, knowledge of diet and physical activity recommendations, and healthy eating and physical activity behaviors can predict college students' self-esteem. The first variable to enter the model and significantly increase the amount of variance explained was the food motive of mood ($\beta = 0.23$; R^2 change = 0.07; $F(1, 209) = 13.90$, $p < .001$). The food motive of health entered next and significantly increased the amount of variance explained ($\beta = -0.21$; R^2 change = 0.07; $F(2, 208) = 16.22$, $p < .001$). The final three variables to enter and significantly increase the amount of variance explained were the following: the exercise motive of health ($\beta = -0.23$; R^2 change = 0.02; $F(3, 207) = 12.89$, $p < .001$); the exercise motive of attractiveness ($\beta = 0.22$; R^2 change = 0.03; $F(4, 206) = 12.14$, $p < .001$); and the food motive of ethical concern ($\beta = 0.16$; R^2 change = 0.02; $F(5, 205) = 11.07$, $p < .001$). No other variables significantly explained additional variance in self-esteem. These findings suggest that for college students, certain food and exercise motives are related to self-esteem. The potential impact of college students' health-related motives and behaviors on self-esteem may be beneficial in developing interventions related to health and self-esteem.

Eating a healthy diet and being physically active are essential to leading a healthy and long-lasting life. According to the United States Department of Health and Human Services (US DHHS, 2004), engaging in moderate physical activity can significantly reduce the risk of developing or dying from chronic diseases such as heart disease, diabetes, colon cancer, or high blood pressure. From a public health perspective, physical activity plays a vital role in preventing weight gain and promoting the maintenance of weight loss. Being overweight or obese significantly raises the risk of adverse health effects such as high blood pressure, high cholesterol, type 2 diabetes, heart disease and stroke, gallbladder disease, arthritis, sleep disturbances and breathing problems. Obese individuals may also suffer from social stigmatization, discrimination, and lowered self-esteem. Regular physical activity offers several health benefits including increased muscle and bone strength, increased lean muscle, decreased body fat, enhanced psychological well-being, and possible decreases in the risk of developing depression, symptoms of depression and anxiety, and improvement in mood (Silberstein, Striegel-Moore, Timko, & Rodin, 1988; US DHHS, 2004).

Over the last few decades, the percentage of Americans who are clinically overweight has steadily increased (National Center for Health Statistics, 2004). In 2006, more than two-thirds of Americans were overweight or obese (Ogden et al., 2006). Furthermore, in 2007, 23.9% of Americans did not participate in leisure-time physical activity, and 77.3% did not consume enough fruits and vegetables (Centers for Disease Control and Prevention, 2002, 2008). Better nutrition and exercise practices could prevent 300,000 deaths each year from heart disease, diabetes, cancer, and stroke.

The obesity trend in the United States has infiltrated college-aged student populations. Approximately 38% of college students are classified as either slightly or very overweight (American College Health Association [ACHA], 2008). Although college students may have access to information about the hazards of poor dietary choices and a sedentary lifestyle, and about how to improve their health-related behaviors via such tools as the United States Department of Agriculture's (USDA's) online MyPyramid.gov, they do not necessarily make positive health behavior choices. In fact, studies have indicated that college students have poor nutrition habits and often exhibit at-risk weight control

behaviors. College students tend to engage in a number of unhealthy eating behaviors including extreme dieting, skipping meals, high intake of fast foods, low intake of fruits and vegetables, and minimal consumption of dairy products (ACHA, 2008; Cotugna & Vickery, 1994; Douglas & Collins, 1997; Huang et al., 2003; Matvienko, Lewis, & Schafer, 2001). Furthermore, when young adults begin college, the new environment may place them at increased risk for developing unhealthy eating habits and adopting a more sedentary lifestyle. Because beginning college is a period when students begin to manage their own lives and to adopt and solidify their health-related habits, it is important to investigate factors associated with activities such as being physically active and choosing to consume a healthy diet, as well as how these health behavior choices may affect their psychological well-being.

Some researchers are studying how knowledge of diet and physical activity may affect people's corresponding health behaviors. For example, nutritional knowledge has been positively correlated with healthy eating (Wardle, Parmenter, & Waller, 2000), and knowledge regarding physical activity has been positively correlated with being more active (Rimal, 2001). However, researchers have not yet related both nutritional and physical activity knowledge and their corresponding behaviors to psychological factors such as self-esteem.

Self-esteem is an important factor in measuring an individual's overall psychological well-being (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). Psychological factors such as depression, neuroses, and psychosomatic symptoms of anxiety often accompany low self-esteem (Rosenberg, 1965). In addition, physical activity appears to promote psychological well-being and reduces feelings of mild to moderate depression and anxiety (Silberstein et al., 1988; US DHHS & USDA, 2005). However, researchers have not cohesively investigated how college students' health behaviors may affect their psychological well-being.

Some researchers are attempting to understand how eating attitudes and food choice motives play a role in self-esteem. Many of these studies concentrate on self-esteem in relation to eating attitudes that are associated with disordered eating (Furnham, Badmin, & Sneade, 2002; Furnham & Calnan, 1998; Baş, Aşçi, Karabudak, & Kiziltan, 2004). Few, if any, studies have looked at normal or nonmaladaptive (maladaptive, as defined by the current study, means behavior and/or motive that is counter-productive or interferes with everyday living) eating motives in relation to self-esteem. However, a multidimensional measure for eating motives that underlies food choices has been developed by Steptoe, Pollard, and Wardle (1995) for

potential use in fields such as health psychology and will likely be useful for implementing appropriate strategies for health intervention models. This multidimensional measure for food choice motives includes factors such as choosing foods based on healthiness, mood enhancement, being convenient, having sensory appeal, having natural contents, having an affordable price, facilitating weight control, being familiar, and promoting ethical choices.

Silberstein et al., (1988) found a positive correlation between exercise and well-being. Many studies have examined the relationship between reasons or motives for exercise and self-esteem (Furnham et al., 2002; Silberstein et al., 1988; Strelan, Mehaffey, & Tiggemann, 2003; Tiggemann & Williamson, 2000). In these studies, researchers have generally found that exercising for appearance is moderately negatively related to self-esteem, and that exercising for health and/or fitness reasons is moderately positively related to self-esteem. Furthermore, exercising for enjoyment and/or mood reasons is moderately positively related to self-esteem (Strelan et al., 2003).

Other, more complex relationships of how health behaviors affect college students' well-being have not been explored. Because past studies have shown that college students make poor health choices (ACHA, 2008; Cotugna & Vickery, 1994; Douglas & Collins, 1997; Huang et al., 2003; Matvienko et al., 2001) it is logical to assume that they will suffer from negative health effects due to these poor choices. Furthermore, according to past studies, these poor health choices and negative health effects could, in turn, lead to impaired psychological well-being (Silberstein et al., 1988; US DHHS, 2004). Self-esteem is an important factor in measuring an individual's overall psychological well-being (Rosenberg et al., 1995).

The current research will consider more complex relationships among college students' self-esteem and their knowledge, motivations, and behaviors regarding eating a healthy diet and being physically active. More specifically, this study will investigate whether certain food choice motives, exercise motives, knowledge of diet and physical activity recommendations, and healthy eating and physical activity behaviors can predict college students' self-esteem. Based on previous research findings, I hypothesized that if the food choice motive of mood and the exercise motives of attractiveness and mood were primary motives, it would predict lower self-esteem. I also hypothesized that if the food choice motive of health and the exercise motives of health, fitness, and enjoyment were primary motives, it would predict higher self-esteem. Furthermore, I hypothesized that greater knowledge of diet and physical activity recommendations and more frequent healthy eating

and physical activity behaviors would predict higher self-esteem.

Method

Participants

Participants were 268 undergraduate students, 93 men and 175 women enrolled in a sophomore-level psychology course at a large southern university. Approximately 25% were 19 years old or younger, about 46% were 20 or 21 years old, 19% were 22 or 23 years old, about 4% were 24 or 25 years old, and about 7% were 26 years old or older. Almost 62% of the students were Non-Hispanic White, about 24% were Hispanic, 7.5% were African American, 1.5% were Asian, and about 5% classified themselves in other ethnic groups. Most students described themselves as middle class (45%) or upper-middle class (31%).

Materials

The materials for this study included a consent form and a 98-item survey divided into six sections that assessed participants' self-esteem as well as their behaviors, motivations, and knowledge regarding eating a healthy diet and engaging in physical activity. In order to control for social-desirability response bias, the six sections were ordered as follows: (a) demographic questionnaire, (b) dietary and physical activity assessment, (c) food choice motivations, (d) physical activity/exercise motivations, (e) knowledge of healthy diet and physical activity recommendations, and (f) self-esteem. The demographic section of the questionnaire included questions about the participants' age; gender; ethnicity; whether they were seeking a major or minor in nutrition and foods, the department of health, physical education, and recreation, or other; whether or not they lived on the college campus; and their socioeconomic status.

To determine participants' healthy eating behaviors, I formulated multiple choice questions from the USDA's healthy eating recommendations found in the *Dietary Guidelines for Americans, 2005* (US DHHS & USDA, 2005). Questions addressed participants' fruit, vegetable, whole grain, and dairy consumption in the last seven days. The internal consistency of the healthy eating behavior factors was high, with a Cronbach's score of 0.71.

In order to survey physical activity behaviors, I adapted questions from the Physical Activity Assessment Tool or PAAT (Meriwether, McMahon, Islam, & Steinmann, 2006). The PAAT was originally developed for physicians to quickly assess a patient's physical activity in order to make proper recommendations to the patient. The PAAT includes questions that measure type, frequency, and duration of moderate and vigor-

ous activity from all four domains of physical activity (leisure, occupational, household, and transportation) in the last seven days, and asks if this is "more, less, or about the same as usual" activity. I included these questions in my questionnaire, but I modified the open-ended questions to a multiple-choice format so the questionnaire could be computer scored. The original PAAT also included questions about contraindications to physical activity, physical activity stage of change (i.e., precontemplation, contemplation, preparation, action, and maintenance), patient-oriented benefits, and psychosocial facilitators of physical activity, but I did not include them because they were not applicable to the subject of this study.

Regarding PAAT validity, Meriwether and colleagues (2006) reported that the PAAT was significantly correlated with the International Physical Activity Questionnaire (IPAQ), which is a validated self-report measure for physical activity, ($r = 0.56, p < 0.001$) and the Manufacturing Technology, Inc. (MTI) accelerometer, which is a direct, objective measure of physical activity ($r = 0.39, p = 0.02$) for moderate-to-vigorous physical activity. Seven-day test-retest reliability was comparable for the PAAT ($r = 0.62, p < 0.001$) and the MTI accelerometer ($r = 0.53, p < 0.001$; Meriwether et al., 2006). The PAAT classified participants as "active" or "underactive" concordantly with the MTI accelerometer for 69.8% of participants and with the IPAQ for 66.7%; strength of agreement was fair ($\kappa = 0.34$ and 0.21 , respectively). The PAAT classified fewer participants as active than either the MTI ($p = 0.17$) or the IPAQ ($p < 0.001$), and measured physical activity more like the direct objective measure (the MTI accelerometer) than did the IPAQ.

To evaluate food choice motivations, I adapted questions from the Food Choice Questionnaire (Steptoe et al., 1995). Steptoe et al. (1995) developed the original 68-item questionnaire to measure eating motives that underlie food choices, and included such factors as health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern. However, I omitted the factor of sensory appeal, which consisted of four items, because it was not relevant to this study's purpose. The order of the items was very close to the order of the items in the original questionnaire. Participants were asked to endorse the statement "It is important to me that the food I eat on a typical day..." for each of the 64 items by choosing between four responses: *not at all important*, *a little important*, *moderately important*, and *very important*, scored from 1 to 4. For example, some statements for the 9 food choice factors were: "is nutritious," "cheers me up," and "is cheap." The internal consistency of the food choice questionnaire factors, as reported by

Stephoe et al. (1995), was high with Cronbach's α scores as follows: health = 0.81, mood = 0.83, convenience = 0.84, natural content = 0.86, price = 0.83, weight control = 0.85, familiarity = 0.72, ethical concern = 0.74.

To measure participants' physical activity/exercise motivations, I adapted questions from the Reasons for Exercise Inventory (Silberstein et al., 1988). The questionnaire asks the participants to rate the importance of a variety of reasons for why they may exercise using a scale ranging from 1 (*not at all important*) to 7 (*extremely important*). I included all of the original 24 items of the questionnaire; questions assessed factors such as weight control, fitness, mood, health, attractiveness, enjoyment, and tone. For example, some statements for the 7 exercise factors were: "to be slim," "to have fun," and "to improve my appearance." To facilitate computer scoring, I slightly altered the range of the scale to range from A (*not at all important*) through D (*very important*). The internal consistency of the food choice questionnaire factors, as reported by Silberstein et al. (1988), was good with Cronbach's α scores as follows: weight control = 0.81, fitness = 0.71, health = 0.73, attractiveness = 0.78, enjoyment = 0.67, tone = 0.74, mood = 0.79.

To assess participants' knowledge regarding eating a healthy diet, I adapted a total of seven multiple choice questions from the Nutrition Knowledge Questionnaire (Parmenter & Wardle, 1999) and the recommendations given by the USDA in the *Dietary Guidelines for Americans, 2005* (US DHHS & USDA, 2005). The questions included items that referenced recommendations to eat from the following particular food groups: fruits, vegetables, milk and milk equivalent products, fats, and whole grains. For example, some of the questions were: "According to accepted guidelines, how many cups of fruit do you think people should consume per day (for a reference 2,000 calories a day intake?)" and "What do experts consider the healthiest type of fat?"

In order to survey participants' knowledge regarding physical activity recommendations, I adapted six multiple choice from the interview questions used by Morrow, Krzewinski-Malone, Jackson, Bungum, and FitzGerald (2004) and the recommendations provided by the USDA (2005) and the US DHHS (2005) in *Dietary Guidelines for Americans, 2005*. For example, some of the questions were: "What is the minimum number of days per week you believe a person must be physically active in order to receive any health benefit?" and "What is the minimum length of time (in minutes) one needs to be physically active throughout a typical day in order to achieve a health benefit?" The factors measuring overall knowledge of a healthy diet and physical activity recommendations had a Cronbach's α score of 0.59.

Lastly, to determine participants' self-esteem, I used the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965), a generally accepted measure of self-esteem. The scale is a 10-item questionnaire in which positive and negative statements are presented alternatively to reduce the danger of response set. In this study, participants answered the 10 items using a 4-point scale, with possible responses ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Sample statements were: "On the whole, I am satisfied with myself," and "At times, I think I am no good at all." The Rosenberg Self-Esteem Scale has an estimated Cronbach's α score of 0.69 and an estimated test-retest reliability score of 0.78 (Mohamadi, 2004).

Procedure

Students in a psychology class at a large southern university were asked by their professor to volunteer to be part of the research study following a class examination in order to receive extra credit points for that particular class. However, any students who did not wish to participate were given an alternative extra credit option. All volunteers were asked to sign a consent form upon their decision to participate in the study; however, their names were not connected to their responses. Information disclosed by the participants remained confidential, and the general results from the study were provided to students upon request.

The professor explained the procedure for participation in the study before the students began their class examination. At this time, the professor also gave the information about the research, including what the study was considering, assurances of anonymity, and the instructions for the surveys. After the students completed their class examination they approached the researcher to receive the survey materials, which included a 98-item questionnaire, consent form, and a Scantron answer sheet. The consent form described the information requested during the study, identified any foreseen risks, gave assurances of anonymity, and provided further contact information if students were interested in learning about the hypotheses and results. Once the participants completed the survey, they returned the materials to the researcher and signed a separate sheet in order to receive their extra credit. The students then left the room after they finished.

Results

A regression analysis using a forward method of variable entry was performed with self-esteem as the dependent variable. The predictor variables included the eight food choice motives of health, mood, convenience, natural content, price, weight control, familiarity, and ethical concern; the seven exercise motives of weight control,

fitness, mood, health, attractiveness, enjoyment, and tone; recommended diet/exercise knowledge; physical activity behavior; and healthy eating behavior.

The food choice motive of mood entered the model first and accounted for 7% of the variation in self-esteem ($\beta = 0.23$; R^2 change = 0.07; $F(1, 209) = 13.90$, $p < .001$). The food motive of health entered next and significantly increased the variation in self-esteem to 14% ($\beta = -0.21$; R^2 change = 0.07; $F(2, 208) = 16.22$, $p < .001$). The final three variables that entered the model and significantly increased the amount of variance in self-esteem to 21% were the following: the exercise motive of health ($\beta = -0.24$; R^2 change = 0.02; $F(3, 207) = 12.89$, $p < .001$); the exercise motive of attractiveness ($\beta = 0.22$; R^2 change = 0.03; $F(4, 206) = 12.14$, $p < .001$); and the food motive of ethical concern ($\beta = 0.16$; R^2 change = 0.02; $F(5, 205) = 11.07$, $p < .001$). No other variables significantly explained additional variance in self-esteem.

Because the self-esteem items were coded so that a lower score meant higher self-esteem, having the primary food choice motive of health and the primary exercise motive of health were related to higher self-esteem. On the other hand, having the primary food choice motives of mood and ethical concern as well as the primary exercise motive of attractiveness were related to lower self-esteem.

Discussion

These results support my original predictions that if the food choice motive of mood and the exercise motives of attractiveness and mood were primary motives, they would predict lower self-esteem. These results also support my hypotheses that if the food choice motive of health and the exercise motive of health were primary motives, they would predict higher self-esteem. Unexpectedly, the food choice motive of ethical concern added to the amount of variance in self-esteem and was indicative of a lower self-esteem. The food choice item of ethical concern consisted of the following statements: "Comes from countries I approve of politically," "Has the country of origin clearly marked," and "Is packaged in an environmentally friendly way." Furthermore, contrary to my expectations, health-related knowledge and health-related behaviors were not significant contributors to the amount of variance in self-esteem.

This study suggests that particular food choice and exercise motives may be the strongest predictors of college students' self-esteem. These motivations may be more important correlates of self-esteem than health-related knowledge or health-related behavior. Moreover, the findings indicate that primarily choosing foods and exercising for health reasons can significantly predict higher self-esteem in college students.

The findings also suggest that exercising for mainly attractiveness reasons and choosing food based largely on mood or ethical reasons can significantly predict lower self-esteem in college students. This is similar to previous research findings, which concluded that exercising for appearance is moderately negatively related to self-esteem, and that exercising for health reasons is moderately positively related to self-esteem (Furnham et al., 2002; Silberstein et al., 1988; Strelan et al., 2003; Tiggemann & Williamson, 2000). Previous research has also indicated that ethical concern may influence food choice and that this factor does not appear to be correlated with social desirability scores (Steptoe et al., 1995). That is to say that the food choice factor of ethical concern is not simply based on presenting a set of motives that are assumed to be socially acceptable (Steptoe et al., 1995). The reason why the food choice motive of ethical concern may predict lower self-esteem in college students should be explored in future research.

It is important to note that this study only outlines relationships among these variables. To determine cause and effect relationships, future research could employ a longitudinal design that includes a wider variety of participants, not just college students. Possible research questions could include the following: Are particular food choice and exercise motives better able to predict health behaviors? Does increasing people's knowledge about healthy diet and physical activity improve his or her health-related behaviors and/or change his or her eating and exercise motives? Can improving people's eating and physical activity behaviors enhance psychological factors, such as self-esteem and well-being? Answers to these questions could improve the development of interventions to help individuals acquire and maintain healthy habits and improve their well-being.

Future researchers could also adopt theoretical frameworks, such as the health belief model (HBM) and the theory of planned behavior (TPB), to investigate how and why college students decide to engage or not engage in particular health behaviors such as healthy eating and exercising (Straub, 2007). The HBM states that decisions about health behaviors are based on four interacting factors (perceived susceptibility to health threats, perceived severity of health threats, perceived benefits of and barriers to treatment, and cues to action) that influence our perceptions about health threats (Straub, 2007). In other words, if we believe that a health behavior will reduce our vulnerability to or the severity of a particular health threat, then we will be more likely to engage in that health behavior (Straub, 2007). Perhaps in future studies, researchers could investigate college students' perceived susceptibility

to health threats, perceived severity of health threats, perceived benefits of and barriers to treatment, and cues to action with regard to health behaviors such as healthy eating and exercising.

The TPB specifies relationships among attitudes and behavior, and argues that the best way to predict whether a health behavior will occur is to measure people's behavioral intentions or their decision to engage in or refrain from a health-related behavior (Straub, 2007). Behavioral intentions, in turn are predicted by attitudes toward the behavior; subjective norms, which reflect our motivation to comply with the views of other people regarding the behavior in question; and perceived behavioral control, which refers to our expectation of success in performing the contemplated health behavior (Straub, 2007). Perhaps in future studies, researchers could investigate whether a health behavior, such as healthy eating or exercise, will occur based on college students' behavioral intentions.

Numerous studies have been conducted using the HBM or the TPB as a theoretical framework to examine countless health behaviors including a few that look at healthy eating and physical activity (Ajzen & Timko, 1986; Conner, Norman, & Bell, 2002; Deshpande, Basil, & Basil, 2009; Juniper, Oman, Hamm, & Kerby, 2004; Povey, Conner, Sparks, James, & Shepherd, 2000). However, few have looked specifically at these health behaviors in college student populations. I anticipate that research that applies theoretical frameworks such as the HBM and the TPB to college students' health behaviors will become increasingly more sophisticated in the years to come and thus be able to draw more causal inferences.

One study conducted by Stelfefon, Zhongmiao, and Klein (2006) created inconsistent cognitions within college students about their diet and exercise behaviors in order to elicit positive changes in their diet and physical activity behaviors. They found that making college students feel greater levels of risk for health problems associated with eating and exercise behaviors had little effect on their health-related behaviors. Furthermore, they found that emphasizing the effect of health behaviors on physical appearance is important in increasing positive health-related behaviors. These results may have an interesting implication when taking into account the results of the regression analysis from the current study. The exercise motive of attractiveness accounted for 3% of the variance in low self-esteem, even after taking into account several other eating and exercise motives. Perhaps future studies could look more closely at the relationship among these variables (i.e., the health behavior motives of attractiveness and appearance, self-esteem and/or other important psychological factors, cognitions surrounding health-

related behaviors, and health behavior change) in order to develop appropriate intervention strategies that target college students' health-related behaviors.

Limitations of the current study are worth noting. Physical activity and healthy eating behaviors were not individualized. For example, the survey did not take into consideration the different dietary needs of individuals based on age, gender, and physical activity level. The survey also did not ask the participants about everything they ate, just about the healthy foods they ate. This is important to note because recommended calorie intake will differ for individuals depending on age, gender, and activity level (USDA & US DHHS, 2005).

Furthermore, because physical activity/diet recall and reporting involve a complex cognitive process, misclassifications by participants may have occurred due to errors in the interpretation of questions; estimation of duration, frequency, and intensity of physical activity periods; estimation of frequency and amount of food groups, or failure to recognize some activities as physical activity (Baranowski, 1988; Durante & Ainsworth, 1996; Montoye, 2000; Sallis & Saelens, 2000; Taylor et al., 1984; Washburn & Montoye, 1986). Future studies could focus more on the individual by implementing a more direct empirical research method, such as having participants wear a heart monitor in order to record their level of physical activity and having them record their diets in a food diary that professionals could examine and rate on a scale of healthfulness.

In a society that emphasizes appearance and success while also suggesting that we indulge ourselves, motives related to eating and exercising can become complex. The data here suggest that primarily choosing foods and exercising for health reasons can significantly predict higher self-esteem in college students. The findings also suggest that exercising for mainly attractiveness reasons and choosing food based largely on mood or ethical reasons can significantly predict lower self-esteem in college students. Becoming more self-aware about the reasons behind our choices and possible implications of those choices for our physical and psychological health may ultimately promote the well-being of individuals and society as a whole.

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