FACTORS RELATED TO MEETING PHYSICAL ACTIVITY GUIDELINES
IN COLLEGE STUDENTS: A SOCIAL COGNITIVE PERSPECTIVE

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Engaging in regular physical activity is important for maintaining and improving health. Unfortunately, most college students fail to meet the recommendations for both aerobic and muscle-strengthening physical activity guidelines (PAGs). Psychosocial factors described within the social cognitive theory are related to the acquisition and retention of physical activity behaviors. The purpose of this study was to examine the relations of gender, self-efficacy, outcome expectancies, and social support with college students meeting aerobic, muscle-strengthening and both PAGs. Participants (N = 396) completed online questionnaires assessing their physical activity behaviors, exercise self-efficacy, outcome expectancies, and social support. Self-reported physical activity was classified as meeting / not meeting PAGs. Using gender, exercise self-efficacy, outcome expectancies, and social support as predictors, separate logistic regressions were used to examine their relations with the three PAG classifications. Analyses revealed that being male and level of social support increased the odds of meeting muscle-strengthening PAGs, but students’ level of self-efficacy and outcome expectations increased the odds of meeting all three PAG classifications. These findings indicate that interventions designed to increase self-efficacy and outcome expectancy may be beneficial for increasing college students’ physical activity for meeting the PAGs. Promotion of muscle-strengthening activities targeted at young women is also warranted.
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FACTORS RELATED TO MEETING PHYSICAL ACTIVITY GUIDELINES
IN COLLEGE STUDENTS: A SOCIAL COGNITIVE PERSPECTIVE

Introduction

Physical activity that occurs regularly for the primary purpose of improving or maintaining physical fitness, physical performance, or health is essential for maintaining quality of life (United States Department of Health and Human Services [USDHHS], 2010b). Engaging in regular physical activity benefits both physical and psychosocial health (Centers for Disease Control and Prevention [CDC], 2011a, 2011d). Benefits of regular physical activity include strengthening of bones and muscles, controlling of weight and maintaining a healthier body composition, increasing the resistance to diseases, and improving the chance of living longer (CDC, 2011d). The psychosocial health benefits of regular physical activity can improve mental health and enhance the quality of life by increasing enjoyment, self-esteem, energy, and desire to engage in social activities, which improves social skills and networks, and reduces isolation and loneliness (Armstrong & Oomen-Early, 2009; CDC, 2011d). Despite strong evidence that supports the physical and psychosocial health benefits of regular physical activity, more than 80 percent of adults and adolescents do not regularly participate in enough aerobic and muscle-strengthening activities for improved health (National Center for Health Statistics, 2012). Furthermore, research indicates participation in regular physical activity typically declines with age with the two greatest declines occurring during adolescence and young adulthood (Caspersen, Pereira, & Curry, 2000; Lowry et al., 2000).

To maximize the potential of achieving the aforementioned health benefits, minimal physical activity recommendations were established for adolescents, adults, and seniors (USDHHS, 2008). These recommendations, entitled 2008 Physical Activity Guidelines (PAGs)
for Americans, are based on evidence related to fitness, physical activity, and energy expenditure to health outcomes (Morrow et al., 2013; USDHHS, 2008). The PAGs for adults are 150 minutes of moderate aerobic physical activity per week or 75 minutes of vigorous aerobic physical activity per week, or an equivalent combination of moderate and vigorous aerobic physical activity (CDC, 2011e; Garber et al., 2011). Additionally, adults should engage in muscle-strengthening activities that work all major muscle groups (i.e., legs, hips, back, abdomen, chest, shoulders, and arms) at least two days a week (CDC, 2011e; Garber et al., 2011). While often not discussed or differentiated in physical activity research, recent research has suggested that muscle-strengthening activities provide additional cardiovascular and metabolic benefits independent of aerobic activity (Church et al., 2010; Garber et al., 2011; Loustalot, Carlson, Kruger, Buchner, & Fulton, 2013). Therefore, engaging in both types of physical activity should be regular.

Unfortunately, even though the PAGs are well-established and heavily promoted by health professionals, less than 25% of adult males and female 17% of adult females meet both aerobic and muscle-strengthening recommendations (National Center for Health Statistics, 2012). Furthermore, the National Center for Health Statistics (2012) indicates that less than 53% of adult males and 46% of adult females meet aerobic recommendations and approximately 29% of males and 20% of females meet muscle-strengthening recommendations. This suggests that muscle-strengthening activity is particularly not adequately represented, especially among females. Also, consistent with the decline in physical activity participation, meeting physical activity guidelines has a strong age-related decline with a steep decline occurring from adolescence to young adulthood (National Center for Health Statistics, 2012). One possible explanation for this decline is environment transitions. The transition from high school to college involves many new challenges (e.g., academic pressures, greater independence, less defined
structure, and change in social environment) that affect health behavior, especially physical activity behavior (Hoffman, Policastro, Quick, & Lee, 2006; Keating, Guan, Piñero, & Bridges, 2005). For instance, motivation to study more might hinder or even extinguish the motivation to be physically active (Hoffman et al., 2006). Therefore, inadequate levels of or weakly supported motivations to be physically active during this transition may inhibit regular of physical activity (Lowry et al., 2000; Sallis, 2000).

Although government agencies (e.g., CDC), private foundations (e.g., Robert Wood Johnson Foundation, United Way of America, etc.), and health professionals (e.g., American College of Sports Medicine) have adamantly promoted regular physical activity, interventions designed around direct promotion have been relatively unsuccessful in producing long-term behavior change (CDC, 2011b; George et al., 2012). In fact, knowledge of its importance and the simple request or suggestion of others to increase physical activity behavior is unlikely to produce a long-term change in this behavior (Nahas, Goldfine, & Collins, 2003). This finding suggests that there are other indirect factors (e.g., psychosocial) that need to be examined in order to determine how physical activity behavior can be permanently changed. For instance, Pauline (2013) found that male college students were motivated to engage in physical activity by factors such as challenge, competition, affiliation, and social recognition, while females were motivated by perceived appearance, health, and stress management factors. Designing physical activity interventions that target these factors through enhanced psychosocial variables may increase motivation and be more successful in producing a lasting change. Therefore, many health professionals (i.e., researcher and practitioners) have begun to shift their focus from the direct promotion of physical activity to programs specifically designed to enhance psychosocial
factors such as self-efficacy, outcome expectancies, and social support (Keating et al., 2005; Nahas et al., 2003).

Instead of simply promoting physical activity, these intervention programs aim to positively affect individuals’ motivation for participation. This establishes the need to accurately identify personal behavior changes relative to physical activity and to understand why and how psychosocial factors affect this relationship (Hoffman et al., 2006). Accurately identifying which factors have stronger relations is the first step for developing effective intervention programs that increase both regular physical activity adoption and help maintain its practice (Anderson, Winett, & Wojcik, 2007; Wallace, Buckworth, Kirby, & Sherman, 2000).

Social Cognitive Theory

Over the last two decades, Bandura’s (1986) social cognitive theory (SCT) has been one of the most prominent approaches to study the acquisition and retention of health behavior, including physical activity behavior (Anderson et al., 2007; Rhodes, Matheson, & Mark, 2010; Wójcicki, White, & McAuley, 2009). Bandura (1986, 1989, 2001) describes the SCT as a comprehensive theory of human agency (i.e., capacity to make choices) that is centered on the belief that behavior is explained by triadic reciprocal determinism within an interactional causal structure. That is, the SCT suggests human behavior is uniquely determined by the triadic, dynamic, and reciprocal interactions of: (a) behaviors (e.g., actions), (b) personal factors (e.g., thoughts, emotions, and biological properties), and (c) social environments (i.e., social influences and physical structures within the environment). Therefore, each facet is bi-directionally influential (i.e., behaviors-personal factors, personal factors-environments, and environments-behaviors) and operates as an interacting factor within the cognitive process. However, the SCT does not imply that these three factors have equal influential strength. In fact, Bandura (1989)
posits that just as actions between individuals may differ, the strengths of these factors may also differ. Key SCT factors of physical activity include self-efficacy, outcome expectations, and social/environmental supports (Bandura, 1997).

Behaviors

The SCT holds that health behavior (e.g., physical activity) is heavily regulated antecedently by cognitive processes (Bandura, 1986). That is, it assumes that individuals are capable of representing these behaviors by utilizing self-regulation, anticipation of valid expected outcomes, and the accurate analysis of behavior during reflection (Wallace et al., 2000). By imposing structure on physical activity, these cognitive processes give individuals the capability to predict the outcome of the physical activity before action occurs. In turn, individuals can decide what action (i.e., being physically active or not) would be deemed more advantageous. In addition, the SCT suggests that new behaviors are not spontaneously learned, but rather they are learned vicariously (Bandura, 1986, 1989). This indicates that initial judgments on expected outcomes are vicariously integrated and heavily influenced by the social environment. Therefore, higher learning environments (e.g., colleges and universities) where physical activity is excessively observable are desirable for acquisition and retention. However, current health trends (e.g., decline in physical activity during young adulthood) indicate that this is more likely not the case.

Personal Factors

Self-efficacy

Among the personal factors outlined in the SCT, self-efficacy is most central and pervasive for predicting health behaviors (Anderson et al., 2007; Bandura, 1989). Additionally, research suggests that self-efficacy is a significant predictor of physical activity adherence and
compliance (McAuley & Blissmer, 2000). Bandura (1986, 1989, 1997) defines self-efficacy as beliefs about capabilities to achieve a favorable outcome when performing a certain behavior. That is, self-efficacy is a personal judgment of what can be achieved with the skills possessed. Thus, self-efficacy can fluctuate if an individual’s perceived ability, motivational influences, and environmental observations change. In turn, these variables affect cognitive processes that encourage or hinder physical activity. It is through this relationship that knowledge of the associated variables enables physical activity behavior to be understood, predicted, and changed (Bandura, 1989, 1993).

**Outcome Expectancies**

Bandura (1977, 1986) describes outcome expectancies as personal psychosocial factors that are highly associated with self-efficacy. Bandura (1997) found that individuals with higher self-efficacy and promising outcome expectations will have better self-regulatory strategies that are essential for maintaining behavior. Purportedly, outcome expectancies for physical activity are largely based on self-efficacy and age (Williams, Anderson, & Winett, 2005). For instance, research examining older adults has shown there to be a strong relationship between expectant outcomes and physical activity behavior; whereas, research examining youth has shown outcome expectancies to have a small total effect on physical activity (Conn, 1998; Rovniak, Anderson, Winett, & Stephens, 2002). These findings may be explained by outcome proximity. That is, older adults likely place a higher value on regular physical activity behavior, because the consequences of physical activity are more easily objectified. However, the value placed on the expected outcomes associated with regular physical activity might depend heavily on other interacting factors such as social support (Petosa, Suminski, & Hartz, 2003). Therefore, it is
important to quantify the impact that varying levels of outcome expectations has on frequency of physical activity.

Social Environments

*Environment*

Bandura (1989) suggests that individuals are both products and producers of their environment, and their behavior is profoundly influenced by both encouraging and discouraging factors. That is, individuals’ behavior can determine aspects within the environment, and the environment (e.g., observed behaviors and social support) can influence their behavior. These social influences convey information and activate reactions through modeling, instruction, and social persuasion (Bandura, 1986).

*Social Support*

One of the most influential social environment factors is the person’s social support network. Social support is defined as support for a given behavior (e.g., physical activity) from important others (Bandura, 1997). As previously mentioned, social support is a key psychosocial factor within Bandura’s SCT, and research suggests social support is an important predictor of physical activity behavior among college students (Gruber, 2008; Wallace et al., 2000). Additionally, social support is commonly thought of as a precursor to self-efficacy, because self-efficacy tends to increase through social support (Anderson et al., 2007; Rovniak et al., 2002). In turn, because changes in self-efficacy are highly related to changes in physical activity behavior, continued social support may not be needed to sustain the behavior (Eyler et al., 1999; McAuley & Blissmer, 2000). However, if a new college student’s self-efficacy for physical activity is low and his or her social support system has not yet been well-establish or does not support regular physical activity, his or her physical activity participation will likely decrease. That is,
considering this transition includes a steep decline in physical activity frequency, students’ levels of self-efficacy and social support for physical activity may be inadequate to initiate or maintain physical activity. Modifying these social support networks to include physical activity could possibly increase physical activity frequency, which then could increase self-efficacy.

As previously mentioned, the SCT implies that beliefs, competencies, expectations, and preferences can be modified by social influences that convey information and trigger emotional reactions through modeling, direction, and persuasion (Bandura, 1989). Furthermore, by examining which social variables best predict college students’ physical activity behavior, it might be plausible to manipulate or enhance them in order to initiate action, produce motivation, and improve self-regulatory participation. Thus, the purpose of this thesis was to examine the predictive strengths of the psychosocial factors (i.e., self-efficacy, outcome expectancies, and social support) on college students’ physical activity. Specifically, because research has indicated that frequency of participation is highly related to gender (Kilpatrick, Herbert, Bartholomew, 2005; Martin, Morrow, Jackson, & Dunn, 2000), this study examines the relations of gender, exercise self-efficacy, outcome expectancies for exercise, and social support for exercise with college students meeting the PAGs for aerobic, muscle-strengthening, and both aerobic and muscle-strengthening. In line with the SCT and consistent with previous research evidence (Martin et al., 2000; National Center for Health Statistics, 2012; Pauline, 2013), it was hypothesized that being male and having higher levels of exercise self-efficacy, outcome expectancies for exercise, and social support for exercise would significantly increase the likelihood of meeting aerobic, muscle-strengthening, and both aerobic and muscle-strengthening PAGs, respectively.
Methods

This study utilized a cross-sectional research design to examine the relationships among college students’ psychosocial factors and physical activity behavior. A direct web link to an Internet questionnaire was emailed to targeted populations and remained available for 15 days. All studied data was collected within previously valid questionnaires.

Participants

The present study included 453 college students from a public research university located in the southwest region of the United States. Since research has shown the transition from high school to college is of particular importance for change in physical activity behavior (e.g., Hoffman et al., 2006; National Center for Health Statistics, 2012), freshman and sophomore level students aged 18 to 20 years old were targeted as participants. Participants were recruited by an email that was distributed by the university’s Division of Student Affairs. The email was sent to all freshmen and sophomores \(N = 5,488\) who had visited the university’s recreation center at least once in the past 6 months. This recruiting method was used with the goal of securing equal sample sizes of male and female students that either met or did not meet aerobic PAGs, muscle-strengthening PAGs, and both aerobic and muscle-strengthening PAGs. Students’ were required to give voluntary consent and be 18 to 20 years old. Once consent was given and correct age was determined, no participants were excluded.

Measures

Demographic Information

Demographic questions (see Appendix B) consisted of nine items. Items included age, height, weight, waist circumference, gender, classification (e.g., freshman), academic major
(e.g., kinesiology), ethnicity, and subjective reasoning for physical activity. Demographic information pertinent to this study were age and gender.

**Exercise Self-efficacy**

The current study used Bandura’s (2006) 18-item exercise self-efficacy (ESE) scale to assess students’ belief capabilities to exercise regularly (see Appendix C). The ESE scale asks participants to rate their belief capabilities from 0 to 10 based on exercising most days a week (Everett, Salamonson, Davidson, 2009). The ESE scale was modified from its original 0 to 100 and three or more days a week in order to reflect current guidelines of physical activity (Briffa et al., 2006). Past research has supported the use of ESE due to its high internal consistency ($\alpha = 0.95$) and lack of floor or ceiling effects (Everett et al., 2009). Consistent with past research the ESE scale had excellent internal consistency ($\alpha = 0.98$).

**Outcome Expectancies for Exercise**

The 16-item revised model of Multidimensional Outcome Expectations for Exercise Scale ([MOEES]; Wójcicki et al., 2009) was used to assess students’ subjective valuation of the probability of certain benefits of engaging in regular physical activity (see Appendix D). Students were asked to indicate, on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5), what degree they agreed with the corresponding statement about their expectations for exercise. In the present thesis MOEES had excellent internal consistency ($\alpha = 0.96$), which was fitting with previous research ($\alpha = .82$ to $.84$; Wójcicki et al., 2009).

**Social Support for Exercise**

The 15-item social support for exercise habits scale (SSEH; Sallis, Grossman, Pinski, Patterson, & Nader, 1987) was used to measure the extent to which students are socially supported in physical activity participation (see Appendix E). The participants were asked to
indicate the truth frequency on a 5-point scale ranging from none (0) to very often (4). This measure assessed both the perceived number of support and the degree to which the participants are satisfied. Previous research have found the SSEH scale has shown good to excellent internal consistency reliability ($\alpha = .86$ to .94; Noroozi, Ghofranipour, Heydarnia, Nabipour, & Shokravi, 2010). The current thesis found the SSEH to have a high internal consistency ($\alpha = 0.92$).

Physical Activity

The 9-item International Physical Activity Questionnaire short form ([IPAQ-SF]; 2002) was used to assess students’ physical activity behavior over the last seven days (see Appendix F). The IPAQ-SF specifically focuses on what kind (i.e., vigorous activity, moderate activity, walking, and sitting) and how much time (i.e., days, hours, and minutes) individuals spend doing these activities in their everyday lives. These items were used to assess aerobic physical activity. Two additional items were created using the same question format (i.e., How many days a week did you do muscle-strengthening activities; If you engaged in muscle-strengthening activities, did you work the following muscle groups in the last 7 days?), so that frequency of muscle-strengthening activity could also be assessed. Currently, there is a limited amount of research assessing multiple types of physical activity. In a pilot study, the two additional questions had good test-retest reliability ($r = 0.80$) and concurrent validity ($r = 0.86$). Craig et al. (2003) found the IPAQ questionnaires produced repeatable data (Spearman’s $\rho$ clustered around 0.8) and have acceptable measurement properties, compared to other self-reports. In the present thesis, items assessing aerobic and muscle-strengthening activity in the IPAQ-SF had good internal consistency ($\alpha = 0.80$ and 0.87, respectively).
Procedures

Once Institutional Review Board approval was granted, researchers contacted the Division of Student Affairs in order to confirm proper email distribution procedures (see Appendix H). Attached to the recruitment email was the participants’ copy of the informed consent notice (see Appendix I) and the direct web link (see Appendix J) to $UNT Qualtrics$ where they completed the internet survey questionnaire entitled, “A Social Cognitive Perspective of College Students’ Physical Activity”. When participants clicked on the link provided, the informed consent notice again appeared as the first of five separate blocks of questions. This questionnaire survey was completely voluntary, and the students could have quit at any time. Therefore, participating and completing the survey constituted consent. The survey had a total of 67 questions, and took an average time of 27 minutes to complete. Because of the time dedication needed to complete this questionnaire, compensation was given. Each participant who completed the questionnaire was entered into a lottery for a $10.00 gift card (one $10.00 gift card per 10 participants; maximum of forty gift cards). To ensure participants’ responses were kept confidential, no identifiable information was collected within the survey questionnaire. Instead, at the conclusion of the survey questionnaire an additional web link (see Appendix G) connected the participant to a survey that’s sole responsibility was to collect email addresses. This ensured that their responses could not be linked to any identifiable information (i.e., email addresses).

Data Analyses

Data were collected using $UNT Qualtrics$. Data was systematically imported into SPSS version 20 so that it could be accurately analyzed. Data from the demographic information measure were analyzed to determine frequency of descriptive statistics (e.g., age and gender), which was then used to determine inclusion. Data from the psychosocial measures were
calculated in order to get an individual raw score per measure. Total raw scores for ESE, MOEES, and SSEH were calculated by summing the numerical ratings for each response (inverting the negative items). Then to achieve standardize number scales (i.e., 0 – 100) between the measures each measure’s total raw score was plugged into the following formula:

\[
\text{Standardized score} = \frac{\text{Total raw score of measure}}{\text{number of items in measure}} \times 100
\]

Higher scores indicated of higher levels of corresponding predictor variables (i.e., self-efficacy, outcome expectancies, and social support).

Participants’ total time in aerobic physical activity was calculated using data collected by IPAQ-SF (items 1-4), and those totals were placed on a continuum in order to dichotomously separate the scores based on meeting aerobic PAGs. That is, data collected from IPAQ-SF were converted to minutes per week to a single scale of aerobic physical activity. Minutes under moderate aerobic physical activity were converted using a 1-for-1 scale, and vigorous aerobic physical activity was converted using a 2-for-1 scale then added to the converted moderate aerobic physical activity total. This conversion allowed all reported aerobic physical activity to be standardized before being calculated and measured against the aerobic PAGs. Once data were converted and calculated, participants were separated into two groups: students who meet aerobic physical activity recommendations, and students that did not meet aerobic physical activity recommendations.

Data from the two additional items were evaluated in order to determine if students met muscle-strengthening PAGs. To qualify as meeting muscle-strengthening PAGs, students needed to report working all major muscle groups (i.e., legs, chest, hips, back, stomach, arms, and shoulders) at least twice in two out of the last seven days. Once muscle-strengthening PAGs data were screened and qualified, students were again separated into two groups: students who met
muscle-strengthening recommendations, and students that did not meet muscle-strengthening recommendations.

Both “meets” groups (i.e., aerobic and muscle-strengthening PAGs) were then cross checked and again separated into two groups: students that met both aerobic and muscle-strengthening recommendations and students that did not meet both aerobic and muscle-strengthening recommendations. Because there is little previous research examining gender differences among college students in physical activity requirements where activity type (i.e., aerobic and muscle-strengthening) is analyzed separately, gender will be controlled for during analyses.

To address the hypothesis, three logistic regression analyses were conducted to assess the likelihood of students’ meeting PAGs (i.e., meets aerobic, meets muscle-strengthening, and meets both aerobic and muscle-strengthening, respectively) using gender, exercise self-efficacy, outcome expectancies for exercise, and social support for exercise as the independent variables. The alpha level of .05 was used for all statistical analyses.

Results

Descriptive Statistics

Of the 453 participants who completed the Internet survey questionnaire 57 had missing data or were excluded from the study for not meeting the inclusion criteria (i.e., appropriate age, 18-20 years; plausibility of responses). The remaining 396 (87%) participants had a mean age of 19.16 years (SD = .77, range = 18-20 years); were 53.5% male and 50.3% sophomore. Participants were 56.2% Caucasian, followed by 17.4% African American, 11.6% Hispanic/Latino, 6.3% Asian, and 8.5% other. This data were comparable to the university
general population. Descriptive statistics for age, gender, and physical activity variables are presented in Table 1.

Descriptive statistics of the psychosocial factors are presented in Table 2. As presented in Table 3, significant correlations were found between most of the independent and dependent variables; specifically, exercise self-efficacy, outcome expectancies for exercise, and social support for exercise were all significantly correlated with each other and with frequency of physical activity ($p < .01$).

As displayed in Table 4, the “meets” criteria of students were analyzed and calculated: 55.8% of the students met aerobic PAGs ($n = 221$; male = 122, female = 99); 39.6% of the students met muscle-strengthening PAGs ($n = 157$; male = 104, female = 53); 30.6% of the students met both aerobic and muscle-strengthening PAGs ($n = 121$; male = 74, female = 47). Descriptive statistics of the physical activity variables are presented in Table 5.

Odds of Meeting PAGs

As a preliminary analysis, chi-squared tests were performed with gender and the dichotomous physical activity variables. As illustrated in Table 6, no statistical differences were found between genders for meeting aerobic PAGs; however, statistical differences were found between genders for meeting muscle-strengthening PAGs ($p < .01$); meeting both aerobic and muscle-strengthening PAGs ($p < .05$); not meeting any PAGs ($p < .01$). As previously stated, three logistic regression analyses were performed to test the hypothesis. The dependent variables were the dichotomies (meets and does not meet) of aerobic activity, muscle-strengthening activity, and both aerobic and muscle-strengthening activities PAGs, respectively.

As shown in Table 7, results of the logistic regression analysis examining aerobic PAGs indicated that exercise self-efficacy and outcome expectancies for exercise were significant
predictors of whether students met aerobic PAGs or not. The likelihood of students meeting aerobic PAGs was increased by exercise self-efficacy (OR = 1.038, 95% CI = 1.024, 1.052, \( p < .01 \)) and outcome expectancies for exercise (OR = 1.025, 95% CI = 1.004, 1.046, \( p < .05 \)). Gender (OR = .948, 95% CI = .584, 1.537, \( p = .827 \)) and social support for exercise (OR = 1.011, 95% CI = .996, 1.025, \( p = .148 \)) did not increase the likelihood of students meeting aerobic PAGs.

The results of the logistic regression analysis examining muscle-strengthening PAGs indicated that gender, exercise self-efficacy, outcome expectancies for exercise, and social support for exercise were all significant predictors of whether students met muscle-strengthening PAGs or not (see Table 8). The likelihood of students meeting muscle-strengthening PAGs was increased by gender (OR = 2.586, 95% CI = 1.593, 4.199, \( p < .01 \)), exercise self-efficacy (OR = 1.021, 95% CI = 1.008, 1.034, \( p < .01 \)), outcome expectancies for exercise (OR = 1.037, 95% CI = 1.013, 1.060, \( p < .01 \)), and social support for exercise (OR = 1.016, 95% CI = 1.002, 1.030, \( p < .05 \)).

As illustrated in Table 9, results of the logistic regression analysis examining meeting both aerobic and muscle-strengthening PAGs showed exercise self-efficacy and outcome expectancies for exercise were significant predictors of whether students met both aerobic and muscle-strengthening PAGs or not. The likelihood of students meeting both PAGs was increased by exercise self-efficacy (OR = 1.033, 95% CI = 1.019, 1.048, \( p < .01 \)) and outcome expectancies for exercise (OR = 1.027, 95% CI = 1.003, 1.052, \( p < .05 \)). Gender (OR = 1.397, 95% CI = .855, 2.283, \( p = .182 \)) and social support for exercise (OR = 1.004, 95% CI = .990, 1.017, \( p = .594 \)) did not significantly increase the likelihood of students meeting both PAGs.
Discussion

The major purpose of this thesis was to examine the current predictive strengths of exercise self-efficacy, outcome expectancies for exercise, and social support for exercise on types and frequency of physical activity behavior among college students. Specifically, the aim of this thesis was to investigate the relations of gender, exercise self-efficacy, outcome expectancies for exercise, and social support for exercise with college students meeting the PAGs for aerobic, muscle-strengthening, and both aerobic and muscle-strengthening. It was hypothesized that being male and having higher levels of exercise self-efficacy, outcome expectancies for exercise, and social support for exercise would significantly increase the odds of students meeting aerobic, muscle-strengthening, and both aerobic and muscle-strengthening PAGs, respectively.

Correlation of Variables

Consistent with previous research evidence, correlations of the independent and dependent variables indicated that aerobic physical activity, muscle-strengthening activity, exercise self-efficacy, outcome expectancies, and social support have significant positive relationships with one another (Chiu & Kayat, 2010; Rovniak et al., 2002). Specifically, results of Pearson product-moment correlations suggest the psychosocial factors are significantly related to both types of physical activity (i.e., aerobic and muscle-strengthening), and these relationships remain relatively consistent between genders. Results provide evidence that participants’ exercise self-efficacy held the strongest correlative value with the other psychosocial factors and the dependent variables.
Odds of Meeting PAGs

Consistent with the chi-squared test, odds ratios from the logistic regression examining whether students met aerobic physical activity requirements revealed that students’ gender did not significantly affect meeting aerobic PAGs. Similar to previous research evidence, this finding could indicate that methods to promote aerobic physical activity could be universal across genders (Hankonen, Absetz, Ghisletta, Renner, & Uutela, 2010). Odds ratios for the psychosocial factors revealed notable findings. Students who reported higher levels of exercise self-efficacy and outcome expectancies had increased odds of meeting aerobic physical activity requirements. However, students’ reported level of social support for exercise did not significantly affect the likelihood of meeting aerobic physical activity requirements. While these findings are consistent with the SCT with regards to self-efficacy and outcome expectancies, the fact that students’ reported level of social support did not increase the odds of meeting aerobic physical activity requirements is perplexing (Bandura, 1989). Because these students were relatively new to college life, this finding could possibly be explained by the low level of reported social support within this population of college students. However, it might also be explained by conflicting social norms within the population. That is, college students’ social support networks within this population are not supporting aerobic activity behaviors (Carlson, Fulton, Schoeborn, & Loustalot, 2010; Caspersen et al., 2000; Dowda, Ainsworth, Addy, Saunders, & Riner, 2003; Racette, Deusinger, Strube, Highstein, & Deusinger, 2005).

Odds ratios from the logistic regression examining whether students met muscle-strengthening activity requirements revealed that students’ gender significantly affects meeting muscle-strengthening PAGs. Consistent with previous research evidence, male students are significantly more likely to meet muscle-strengthening PAGs than female students (CDC, 2013;
Martin et al., 2000). Since Morrow et al. (2013) found muscle-strengthening physical activity to be a stronger predictor of meeting health-related fitness standards; the current findings indicate that developing interventions to increase muscle-strengthening activities specifically designed for female students is warranted within this sub-population. In addition, research suggests that individuals who meet muscle-strengthening PAGs are more likely to participate in regular aerobic activity and have greater knowledge of the benefits of physical activity (Loustalot et al., 2013). Odds ratios for the psychosocial factors again revealed notable findings. Beyond gender, students who reported higher levels of exercise self-efficacy, outcome expectancies for exercise, and social support for exercise had increased odds of meeting muscle-strengthening physical activity recommendations. Consistent with the previous research and the SCT, these findings demonstrate that interventions designed to enhance a single factor and/or a combination of two or more psychosocial factors would likely increase the odds for students’ meeting muscle-strengthening PAGs (Pauline, 2013; Shibata, Oka, Harada, Nakamura, & Muraoka, 2009).

Odds ratios from the logistic regression examining whether students met both aerobic and muscle-strengthening physical activity requirements revealed that students’ gender did not significantly affect meeting both PAGs. In previous research, males were significantly associated with being highly physically active; however, perceptions of barriers for physical activity were consistent between genders (CDC, 2013; Munford, 2011). Therefore, because the transition from high school to college is filled with challenges that affect health behaviors, this finding could reveal that obstacles affecting physical activity within this sample are consistent between genders (Hankonen et al., 2010). Following the same pattern as previous logistic regressions, odds ratios for the psychosocial factors revealed students who reported higher levels of exercise self-efficacy and outcome expectancies for exercise had increased odds of meeting both aerobic and muscle-
strengthening physical activity recommendations. However, similar to the first logistic regression, students’ reported level of social support for exercise did not significantly affect the likelihood of meeting both aerobic and muscle-strengthening physical activity recommendations. Again, while these findings are consistent with the SCT with regards to self-efficacy and outcome expectancies, the fact that students’ reported level of social support for exercise did not increase the odds of meeting both aerobic and muscle-strengthening physical activity recommendations might again be explained by conflicting social norms within this population. Future research is needed to test this hypothesis.

While exercise self-efficacy and outcome expectations both increased the likelihood of students meeting all PAGs, gender and social support only increased the likelihood of meeting muscle-strengthening PAGs. Therefore, implementing strategies to promote self-efficacy and outcome expectancies would likely increase all physical activity levels, while strategies that included social support would likely work best with muscle-strengthening physical activity levels. Based on the SCT, an established way to promoting self-efficacy is to allow students to provide activities that they enjoy and that are consistent with their abilities. This method establishes a foundation for which to build upon that is familiar to the student, while simultaneously allowing them to experience and witness noticeable improvements. This can enhance confidence and will likely give students a sense of accomplishment. Although physical education and increasing awareness of behavior consequences are well-established methods of promoting outcome expectancies, the first-hand experience of witnessing noticeable improvements goes much farther for promoting students’ outcome expectancies for exercise (Kilpatrick et al., 2005; Martin et al., 2000).
Because most physical activity interventions are not carried out under a one-on-one situation, it is beneficial to pair or group students based on ability and interests (Timperio, Salmon, & Ball, 2004). This strategy will allow the students to witness their peers succeeding (i.e., modeling) and possibly establish a relative social support system. Because muscle-strengthening activities often require breaks or short rest periods between activities, working with peers/partners can be beneficial. Therefore, establishing a social network that is overseen by health professionals where incoming college students can find a workout partner could be a viable method for promoting muscle-strengthening activities.

In summary, the findings of the logistic regression analyses partially confirmed the research hypothesis; however, there were several limitations of this thesis. The main limitation of this thesis was all data were self-reported and required recalling on the previous seven days’ activity. While self-reported data allow for easier dissemination, past research has indicated that direct measures are more valid, accurate, and reliable (Prince et al., 2008). Assessing physical activity behaviors is difficult and discrepancies are known to exist between self-reported physical activity data and objectively measured physical activity data (Mackay, Oliver, & Schofield, 2011). Future researchers should use direct measures such as pedometers, accelerometers, observations, and other forms of objective measures as their method of measuring physical activity. The second limitation to this thesis was using a cross-sectional research design for data collection. Since all data are collected during a single in time, this method does not allow for causal conclusions to be made. Future research should utilize methods that collect data over time so that true difference can be measured (e.g., longitudinal). The third limitation of this thesis was that sample sizes of the sub-populations were not equal. Having a sample size that is much smaller than its comparative decreases the power of the analysis. Therefore, future researchers
should secure equal sample sizes for each separating variable (i.e., meet and did not meet PAGs).

The fourth potential limitation was the use of an Internet survey questionnaire. While past research has shown Internet questionnaires to be valid and reliable, online participants did not have the opportunity to ask clarifying questions (Meyerson & Tryon, 2003). This could lead to data that are incorrect or unintended, while also allowing participants to over-report their physical activity, self-efficacy, expectations, and social support due to social desirability. Future research should distribute in-person survey questionnaires so that clarification of question intent can be obtained if needed by the participant. The fifth limitation of this thesis was that samples came from a single university, so results may not be generalizable to other universities. Therefore, to increase generalizability, future research should examine students from other universities as well.

Conclusion

The results of the logistic regression analyses found levels of exercise self-efficacy, outcome expectations for exercise, and social support for exercise to be significant predictors of physical activity frequency. This thesis suggests health interventions designed to enhance these psychosocial variables should increase physical activity frequency among college students. Because colleges and universities provide the diversity and population size needed to develop relevant and more specific physical activity interventions, health professions should have greater success rates for improving college students’ exercise self-efficacy and outcome expectancies for exercise. In turn, this should establish a firm and reliable social support network specifically designed to enhance regular physical activity. The major contribution of this thesis is to demonstrate that the psychosocial factors of college students’ physical activity behaviors are fundamental elements that should be addressed in order to improve their physical activity and
health outcomes. In summary, the results of the present thesis revealed that students who reported higher levels of exercise self-efficacy and outcome expectancies for exercise were more likely to meet aerobic and muscle-strengthening PAGs. Because the health benefits of physical activity are largely contingent on the regularity of both aerobic and muscle-strengthening physical activities, these results suggest self-efficacy and outcome expectancies should be addressed when creating a program to improve health. Based on the SCT, motivation to participate in physical activity derives from the satisfaction obtained while participating in physical activity. This satisfaction likely comes from noticeable accomplishments and improvements in confidence, performance, health, and physical features, which in turn enhances exercise self-efficacy and outcome expectancies. Therefore, health professionals should aim to create health interventions that are less uniformed in order to foster higher levels exercise self-efficacy and outcome expectancies for exercise.
Table 1

*Descriptive Statistics*

<table>
<thead>
<tr>
<th>N = 396</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Min.</th>
<th>Max.</th>
<th>Skewness</th>
<th>SE</th>
<th>Kurtosis</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>19.157</td>
<td>.767</td>
<td>2.00</td>
<td>18</td>
<td>20</td>
<td>-0.274</td>
<td>.123</td>
<td>-1.254</td>
<td>.245</td>
</tr>
<tr>
<td>Gender</td>
<td>.535</td>
<td>.499</td>
<td>1.00</td>
<td>0</td>
<td>1</td>
<td>-0.142</td>
<td>.123</td>
<td>-1.99</td>
<td>.245</td>
</tr>
<tr>
<td>Met Aerobic PAGs</td>
<td>.558</td>
<td>.497</td>
<td>1.00</td>
<td>0</td>
<td>1</td>
<td>1.104</td>
<td>.123</td>
<td>0.306</td>
<td>.245</td>
</tr>
<tr>
<td>Met MSA PAGs</td>
<td>.396</td>
<td>.490</td>
<td>1.00</td>
<td>0</td>
<td>1</td>
<td>0.425</td>
<td>.123</td>
<td>-1.829</td>
<td>.245</td>
</tr>
<tr>
<td>Met Both PAGs</td>
<td>.306</td>
<td>.461</td>
<td>1.00</td>
<td>0</td>
<td>1</td>
<td>0.847</td>
<td>.123</td>
<td>-1.288</td>
<td>.245</td>
</tr>
</tbody>
</table>

*Note.* M = mean; SD = standard deviation; PAGs = physical activity guidelines; MSA = muscle-strengthening activity. Gender, Met Aerobic PAGs, Met Muscle-strengthening PAGs, and Met Both PAGs are dichotomous variables; therefore, M would indicate percentage of sample labeled 1 of said variable (i.e., Gender, Males; Met Aerobic PAGs, Yes; Met Muscle-strengthening PAGs, Yes; Met Both PAGs, Yes).
Table 2

**Gender Breakdown of Self-efficacy, Outcome Expectancies for Exercise, and Social Support for Exercise**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Males (n = 212)</th>
<th>Females (n = 184)</th>
<th>All (N = 396)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Self-efficacy*</td>
<td>59.73</td>
<td>26.04</td>
<td>53.87</td>
</tr>
<tr>
<td>Outcome expectancies</td>
<td>81.00</td>
<td>17.16</td>
<td>79.36</td>
</tr>
<tr>
<td>Social support</td>
<td>47.04</td>
<td>23.51</td>
<td>45.95</td>
</tr>
</tbody>
</table>

**Note.** M = mean; SD = standard deviation. All scores were standardized to have a minimum of 0 and maximum of 100. *Gender means were significantly different at the 0.05 level.

Table 3

**Correlations for Male (n = 212) and Female (n = 184) Participants**

<table>
<thead>
<tr>
<th></th>
<th>ESE</th>
<th>OEE</th>
<th>SSE</th>
<th>TAT</th>
<th>DMSA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESE</td>
<td>–</td>
<td>.623**</td>
<td>.585**</td>
<td>.440**</td>
<td>.702**</td>
</tr>
<tr>
<td>OEE</td>
<td>.728**</td>
<td>–</td>
<td>.622**</td>
<td>.407**</td>
<td>.545**</td>
</tr>
<tr>
<td>SSE</td>
<td>.595**</td>
<td>.633**</td>
<td>–</td>
<td>.470**</td>
<td>.646**</td>
</tr>
<tr>
<td>TAT</td>
<td>.574**</td>
<td>.550**</td>
<td>.479**</td>
<td>–</td>
<td>.518**</td>
</tr>
<tr>
<td>DMSA</td>
<td>.681**</td>
<td>.618**</td>
<td>.499**</td>
<td>.649**</td>
<td>–</td>
</tr>
</tbody>
</table>

**Note.** Upper diagonal represents males, and lower diagonal represents females. ESE = exercise self-efficacy; OEE = Outcome expectancies for exercise; SSE = Social support for exercise; TAT = Students’ total aerobic activity time per week; DMSA = Days per week students’ engaged in muscle-strengthening activities. *Correlation is significant at the 0.05 level (2-tailed) and **Correlation is significant at the 0.01 level (2 tailed).
<table>
<thead>
<tr>
<th>Variables</th>
<th>Meets Aerobic PAGs</th>
<th>Meets Muscle-strengthening PAGs*</th>
<th>Meets Both PAGs*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>Total</td>
</tr>
<tr>
<td>Male</td>
<td>90</td>
<td>122 (57.5%)</td>
<td>212</td>
</tr>
<tr>
<td>Female</td>
<td>85</td>
<td>99 (53.8%)</td>
<td>184</td>
</tr>
<tr>
<td>Total</td>
<td>175</td>
<td>221 (55.8%)</td>
<td>396</td>
</tr>
</tbody>
</table>

Note. PAGs = physical activity guidelines; (%) = percentage of gender/total that met the corresponding PAGs. 100 participants per yes/no category were targeted; *Gender was significantly different at the 0.01 level.
Table 5
Gender Breakdown of Physical Activity Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males (n = 212)</th>
<th>Females (n = 184)</th>
<th>All Participants (N = 396)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Met Aerobic PAGs</td>
<td>.575</td>
<td>.495</td>
<td>.538</td>
</tr>
<tr>
<td>Met MSA PAGs*</td>
<td>.491</td>
<td>.501</td>
<td>.288</td>
</tr>
<tr>
<td>Met both PAGs*</td>
<td>.349</td>
<td>.478</td>
<td>.255</td>
</tr>
<tr>
<td>Did not meet any PAGs*</td>
<td>.283</td>
<td>.452</td>
<td>.429</td>
</tr>
</tbody>
</table>

Note. M = mean; SD = standard deviation; PAGs = physical activity guidelines; MSA = muscle-strengthening activity. All “Met PAGs” variables dichotomous; therefore, M would indicate percentage of sample labeled 1 of said variable (i.e., Participant: Met Aerobic PAGs, Yes; Met MSA PAGs, Yes; Met both PAGs, Yes; Did not meet any PAGs, Yes).
*Gender was significantly different at the 0.01 level.

Table 6
Chi-squared Analysis Comparing Dichotomous Physical Activity Variables between Genders

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Chi²</th>
<th>p value (2-sided)</th>
<th>p value (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender ∙ Meets aerobic PAGs</td>
<td>396</td>
<td>.560</td>
<td>.479</td>
<td>.259</td>
</tr>
<tr>
<td>Gender ∙ Meets muscle-strengthening PAGs</td>
<td>396</td>
<td>16.885</td>
<td>.000**</td>
<td>.000**</td>
</tr>
<tr>
<td>Gender ∙ Meets Both PAGs</td>
<td>396</td>
<td>4.069</td>
<td>.049*</td>
<td>.028*</td>
</tr>
<tr>
<td>Gender ∙ Did not meet either PAGs</td>
<td>396</td>
<td>9.259</td>
<td>.003**</td>
<td>.002**</td>
</tr>
</tbody>
</table>

Note. PAGs = physical activity guidelines.
* p < .05; ** p < .01.
Table 7  
Odds Ratios from Logistic Regression Analysis: Meeting Aerobic PAGs

<table>
<thead>
<tr>
<th></th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>OR</th>
<th>(95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.247</td>
<td>.048</td>
<td>1</td>
<td>.948</td>
<td>(.584 - 1.537)</td>
<td>.827</td>
</tr>
<tr>
<td>ESE</td>
<td>.007</td>
<td>28.347</td>
<td>1</td>
<td>1.038</td>
<td>(1.024 - 1.052)</td>
<td>.000**</td>
</tr>
<tr>
<td>OEE</td>
<td>.010</td>
<td>5.391</td>
<td>1</td>
<td>1.025</td>
<td>(1.004 - 1.046)</td>
<td>.020*</td>
</tr>
<tr>
<td>SSE</td>
<td>.007</td>
<td>2.090</td>
<td>1</td>
<td>1.011</td>
<td>(.996 - 1.025)</td>
<td>.148</td>
</tr>
</tbody>
</table>

Note. N = 396; PAGs = physical activity guidelines; SE = standard error; OR = odds ratio; CI = confidence intervals; ESE = Exercise self-efficacy; OEE = Outcome expectancies for exercise; SSE = Social support for exercise.  
* p < .05; ** p < .01.

Table 8  
Odds Ratios from Logistic Regression Analysis: Meeting Muscle-strengthening PAGs

<table>
<thead>
<tr>
<th></th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>OR</th>
<th>(95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.247</td>
<td>14.760</td>
<td>1</td>
<td>2.586</td>
<td>(1.593 - 4.199)</td>
<td>.000**</td>
</tr>
<tr>
<td>ESE</td>
<td>.007</td>
<td>9.749</td>
<td>1</td>
<td>1.021</td>
<td>(1.008 - 1.034)</td>
<td>.002**</td>
</tr>
<tr>
<td>OEE</td>
<td>.012</td>
<td>9.708</td>
<td>1</td>
<td>1.037</td>
<td>(1.013 - 1.060)</td>
<td>.002**</td>
</tr>
<tr>
<td>SSE</td>
<td>.007</td>
<td>5.365</td>
<td>1</td>
<td>1.016</td>
<td>(1.002 - 1.030)</td>
<td>.021*</td>
</tr>
</tbody>
</table>

Note. N = 396; PAGs = physical activity guidelines; SE = standard error; OR = odds ratio; CI = confidence intervals; ESE = Exercise self-efficacy; OEE = Outcome expectancies for exercise; SSE = Social support for exercise.  
* p < .05; ** p < .01.
<table>
<thead>
<tr>
<th>Variable</th>
<th>SE</th>
<th>Wald</th>
<th>df</th>
<th>OR</th>
<th>(95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.251</td>
<td>1.784</td>
<td>1</td>
<td>1.397</td>
<td>(.855 - 2.283)</td>
<td>.182</td>
</tr>
<tr>
<td>ESE</td>
<td>.007</td>
<td>21.521</td>
<td>1</td>
<td>1.033</td>
<td>(1.019 - 1.048)</td>
<td>.000**</td>
</tr>
<tr>
<td>OEE</td>
<td>.012</td>
<td>4.751</td>
<td>1</td>
<td>1.027</td>
<td>(1.003 - 1.052)</td>
<td>.029*</td>
</tr>
<tr>
<td>SSE</td>
<td>.007</td>
<td>.284</td>
<td>1</td>
<td>1.004</td>
<td>(.990 - 1.017)</td>
<td>.594</td>
</tr>
</tbody>
</table>

*Note. N = 396; PAGs = physical activity guidelines; SE = standard error; OR = odds ratio; CI = confidence intervals; ESE = Exercise self-efficacy; OEE = Outcome expectancies for exercise; SSE = Social support for exercise.*

*p < .05; **p < .01.
APPENDIX A

EXTENDED LITERATURE REVIEW
Factors Related to Meeting Physical Activity Guidelines in College Students: A Social Cognitive Perspective

Regular physical activity is recognized as one of the essential elements to maintain overall health throughout life (Physical Activity Guidelines Advisory Committee [PAGAC], 2008; United States Department of Health and Human Services [USDHHS], 2010b). Unfortunately, the National Center for Health Statistics (2012) indicates that the current frequency of physical activity is not adequate. Moreover, research shows physical activity significantly declines with age with the greatest drop occurring in adolescence and young adulthood (Caspersen, Pereira, & Curry, 2000; Lowry et al., 2000). Results of a national health-related survey found that approximately two-thirds (63.7%) of high school students regularly participate in vigorous physical activity, while only 37.6 percent of college students were regularly participating in this activity (Wallace, Buckworth, Kirby, & Sherman, 2000). USDHHS (1996) suggest that the majority of college students either engage in physical activity irregularly or are completely physically inactive. Research evidence shows that the steep decline in physical activity behavior during the transition from high school to college is negatively associated with the prevalence of overweight and obese individuals (Caspersen et al., 2000; Flegal, Carroll, Ogden, & Curtin, 2010; Mokdad et al., 1998). That is, as participation in physical activity goes down, prevalence of overweight and obese goes up. This transition is filled with many new adversities that affect health behaviors, especially physical activity behaviors. It is believed that various physical, social, and personal factors influence or alter college students’ activity behavior, but the exact determinants of their activity behavior change is not yet fully understood (Lowry et al., 2000; Sallis, 2000).
Physical activity is defined as any bodily movement produced by the contraction of skeletal muscles that result in the use of energy exceeding the basal level, and regular physical activity (i.e., exercise) is defined as activity that is planned, structured, and consistent for the primary purpose of improving or maintaining physical fitness, physical performance, or health (PAGAC, 2008). To simplify measuring occurrences of physical activity behavior, the USDHHS (2002) logically dichotomizes physical activity behavior by defining and/or measuring physical activity as the presence of physical activity during leisure-time and physical inactivity as the absence of physical activity during leisure-time. In response to an overwhelming influx of research displaying the benefits of participating in specific levels of physical activity, minimal standards for physical activity participation for youth, adults, and seniors were established (USDHHS, 2008). These minimal standards, entitled 2008 Physical Activity Guidelines for Americans (PAGs), are based on evidence related fitness, physical activity, and energy expenditure to health outcomes (Morrow et al., 2013). The USDHHS (2008) advocated the important influence individuals’ level of physical activity has on health concerns.

The PAGs for adults are 150 minutes of moderate aerobic physical activity per week or 75 minutes of vigorous aerobic physical activity per week, or an equivalent combination of moderate and vigorous aerobic physical activity. Additionally, it is recommended that adults engage in muscle-strengthening activities that work all major muscle groups at least two days a week in order to achieve maximum health benefits from regular physical activity (USDHHS, 2008). USDHHS included muscle-strengthening activities in the PAGs based on the increasing amount of evidence relating musculoskeletal fitness to health outcomes (Kell, Bell, & Quinney, 2001, PAGAC, 2008).
The physical, mental, cognitive, and social health benefits that are associated with meeting PAGs include: (a) combating health conditions and diseases, (b) strengthening of bones and muscles, (c) increasing energy and ability to do daily activities, (d) improving mental health and mood, (e) increasing cognitive abilities, (f) controlling of weight, (g) promoting better sleep, and (h) increasing the chance of living longer (Armstrong & Oomen-Early, 2009; Centers for Disease Control and Prevention [CDC], 2011d; Hannan, Maio, Komolova, & Adams, 2009; PAGAC, 2008). Even though the benefits of meeting the PAGs are well established and promoted by health professionals and educators, less than 20 percent of young adults are meeting the guidelines (USDHHS, 2008; USDHHS, Healthy People 2020, 2012). Recent activity research has shown that not only is physical activity beneficial, but its counterpart, physical inactivity, actually increases the risks of negative health outcomes (CDC, 2011d; USDHHS, 2010b; Wang, Biddle, Lui, & Lim, 2012; Yach, Hawkes, Gould, & Hofman, 2004). In fact, in 2012 the National Center for Health Statistics found that physical inactivity significantly increases the probability of developing chronic diseases such as cardiovascular diseases, Type-2 diabetes, strokes, and some cancers cases later in life. The World Health Organization (2012) has claimed physical inactivity as the fourth leading risk factor for mortality, and the Institute of Medicine (2012) estimate that as much as 80 percent of cardiovascular diseases, Type-2 diabetes, strokes, and select cases of cancer could be prevented by an increase of physical activity and decrease of physical inactivity. In response, health interventions are commonly designed to encourage physical activity and discourage physical inactivity simultaneously (American Public Health Association, 2012; Nahas, Goldfine, & Collins, 2003). Nevertheless, despite evidence supporting the health benefits associated with regular physical activity and the negative health
consequences associated with physical inactivity, response to this epidemic has remained inadequate (Yach et al., 2004).

Since physical activity may favorably affect weight control, low physical activity levels are believed to be one of the main contributing factors of the increase in prevalence of overweight and obesity (USDHHS, 1996). Because of its relationship with physical activity and aforesaid negative health consequences, the increase in prevalence of overweight and obesity has become a prominent health concern among children and adults (CDC, 2011c). Common ways to assess overweight and obesity are by calculating individuals’ body mass index (BMI) and waist-height ratio (WHtR) using the following formulas:

\[ \text{BMI} = \{[\text{weight (lbs)} / \text{height}^2 \text{ (in)}] \times 703 \} \]

\[ \text{WHtR} = \left[ \frac{\text{waist (in)}}{\text{height (in)}} \right] \]

Individuals with a BMI greater than or equal to 25 or WHtR greater than or equal to .50 are classified as overweight, and individuals with a BMI greater than or equal to 30 or WHtR greater than or equal to .57 are classified as obese (Browning, Hsieh, & Ashwell, 2010; CDC, 2011b).

Because of the rising costs of health care and potentiality regular physical activity has in alleviating it, the USDHHS has funded the Healthy People initiative for the past three decades. The Healthy People initiative, Healthy People 2020, establishes long-term healthy behavior objectives with the goal of achieving a nation of better overall heath (USDHHS, 2010a). Because the transition from high school (i.e., adolescence) to college (i.e., young adults) accompanies many lifestyle changes that might predispose young adults to become less physically active, accomplishing these objectives during this particular life stage proposes a difficult challenge. Therefore, in 2012 the American College Health Association (ACHA) launched the Healthy Campus initiative. Healthy Campus 2020 is a “sister document” to Healthy People 2020 and was
specifically developed to promote healthy behaviors as a preventative measure addressing negative health outcomes for students, staff, and faculty on campuses nationwide (ACHA, 2012). By proactively promoting physical activity rather than retroactively treating the negative outcomes (e.g., cardiovascular diseases), the Healthy People and Healthy Campus initiatives hope to promote a higher quality of life, healthy development, and healthy behaviors across all individuals’ lifespans. However, to accomplish these healthy lifespan objectives, regular physical activity should be established early in life and reinforced through life transitions (e.g., young adulthood) to avoid hindrance. Additionally, firmly establishing physical activity as a regular behavior before this transition is important, because health trends (e.g., increasing obesity rate) and the drop in physical activity frequencies indicate adopting physical activity as a regular behavior after college can be increasingly challenging (CDC, 2012).

Although instituting healthy behavior objectives has shown signs of initiating physical activity, this avenue has not produced a significant increase of individuals who continue this behavior or has it provided a global explanation for discontinuation (Bauman, Finegood, & Matsudo, 2009; CDC, 2011d; Epstein, Roemmich, Paluch, Raynor, 2005; Lemstra, Nielsen, Rodgers, Thompson, & Moraros, 2012; Rhodes & Pfaeffli, 2010; Wang et al., 2012). Nahas et al. (2003) found that activity behavior is unlikely to sustain long-term change by the simple request or suggestion of others. This implies other determining variables need to be targeted for activity behavior to permanently change. Therefore, many researchers and health professionals have shifted their focus from direct promotion to programs specifically designed to enhance the psychosocial predictors of physical activity behavior such as self-efficacy, outcome expectancies, and supportive environments (Keating, Guan, Piñero, and Bridges, 2005; Nahas et al., 2003).
Instead of simply promoting physical activity, these programs aim to nurture the motivation behind or reasoning for physical activity. This objective establishes the need to accurately identify particular and individualized behavior changes that are related to all levels of physical activity and the need to understand why and how these relationships are affected by psychosocial predictors (Hoffman, Policastro, Quick, & Lee, 2006). Identifying these variables should help develop more effective programs that increase both regular physical activity adoption and help maintain its practice (Wallace et al., 2000). Understanding which psychosocial predictors have the greatest manipulative and predictive effects on physical activity behaviors will enable health professionals to formulate interventions that target those predictors (Keating et al., 2005). Furthermore, a better analysis of the cognitive reasoning associated with physical activity behavior should uncover what particular variables can be manipulated in order to increase motivation, and higher learning environments are likely the last educational institutions where this can be readily studied.

Colleges and universities provide the needed structure and authority to exemplify the importance of physical activity that should help develop personal motivation to effectively change behavior. Higher learning environments are potentially a crucial setting in which to discover and enhance the psychosocial predictors of physical activity behavior (Wallace et al., 2000). Unfortunately, current higher learning environments do not include physical activity as a necessary objective in readying young adults for their professional future. Additionally, time obligations (e.g., studies) and exposure to new choice freedoms conflict with the perceptual need for regular physical activity (Buckworth & Nigg, 2004). Thus, changes are needed within collegiate programs so that students recognize the long-term importance of adopting and
maintaining physically active lifestyles; however, the exact changes needed for which to effectively stimulate this behavior change remains unknown (Keating et al., 2005).

Social Cognitive Theory

It is well known that cognitive processes play a prominent role in the acquisition and retention of new health behaviors. Bandura’s social cognitive theory (SCT; 1986, 1989, 2001) is one of the most prominent approaches used to study health behaviors (Anderson, Winett, & Wojcik, 2007; Rhodes, Matheson, & Mark, 2010). Additionally, the psychosocial predictors described within the SCT help explain the motivations behind a vast range of health-related behaviors, including physical activity behaviors (Wójcicki, White, & McAuley, 2009). Bandura (1986) describes the SCT as a comprehensive theory of human agency that is centered on the belief that behavior is explained by triadic reciprocal determinism within an interactional causal structure. Three facets that corner Bandura’s (1989) reciprocal causation model are one’s: (a) behaviors (e.g., actions), (b) personal factors (e.g., thoughts, emotions, and biological properties), and (c) environment (e.g., social influences and physical structures within the environment). Each facet is bi-directionally influential (i.e., behavior-personal, personal-environment, and environment-behavior) and operates as interacting psychosocial predictors within one’s cognitive processes. That is, one’s beliefs, expectations, goals, and intentions related to physical activity help form and direct behavior choices, and actions that follow will then affect thoughts and emotions related to that choice (Bandura, 1986, 1989). Therefore, each behavior is uniquely determined by thoughts that actively construct reality, selectively encode perceptions, consult believed expectations, and reflect back on previous actions (Jones, 1989).

Believing that behavior is interactively determined by the relationships between personal factors and environment, assumes that new behaviors are not spontaneously learned by trial and
error, but rather dependent upon the observation of others’ behaviors, replicating them, and then reflecting on its outcome. Armstrong and Oomen-Early (2009) stated that one is more likely to model their behavior after persons they consider similar or deem related. Consequently, behaviors without related references or behaviors by those with little affinity might be seen as socially conflicting; thus, unlikely to be sustained or even initiated (Bandura, 1989). Knowing that current activity trends show the prevalence of physical inactivity and sedentary behavior on the rise, it can be inferred that the environmental prevalence of physically active models are decreasing. Physical inactivity is gradually becoming the social norm that young adults are observing, learning, and replicating (Bauman et al., 2009). This is why effectively establishing regular physical activity during development is imperative, and why organizations like ACHA, USDHHS, and the CDC have made promoting regular physical activity a major directive.

**Behaviors**

Because human beings are inherently pleasure seekers, convincing inactive individuals to become active has many obstacles. The SCT states that the consequences one associates with a certain behavior will influence the probability that they will perform that behavior in a given situation (Corcoran, 1995; Stone, 1998; Williams, 2010). Furthermore, the perceived consequences of said behavior are used to form its outcome expectation (Bandura, 1986; 1989). Since the benefits (i.e., consequences) of physical activity are not easily quantitative or immediately perceived, the behavior receives a limited reinforcement (i.e., positive outcome expectations). This is why it would be beneficial for physical activity interventions to stray away from direct promotion and instead accentuate and promote the positive thoughts and emotions that elicit participatory motivation and are intrinsically driven. Alderman (1974) defined motivation as the tendency for the direction, selectivity, and persistence of a behavior to be
controlled by its associations with outcome expectations, and Deci and Ryan (2000) stated that intrinsic motivation has the tendency to be the enduring source of motivation. When considering the growing obesity epidemic and prevalence of chronic diseases, it is evident that without recognized connections to desired reinforcers humans’ underlying preference for present over future rewards has become a substantial barrier for adopting regular physical activity (Bradford, 2009). Therefore, in order for physical activity interventions to produce long-term behavioral changes, researchers must first discover what personal predictive variables best establish continuous and self-sustaining motivation.

**Personal Factors**

Self-efficacy. Self-efficacy is the central and most analyzed personal psychosocial predictor described within the SCT. Bandura (1989) defines self-efficacy as one’s beliefs about their capabilities to achieve a favorable outcome when performing a certain behavior. These beliefs can change based motivational influences and environmental observations to affect cognitive patterns that will then encourage or hinder the behavior. It is through this relationship that knowledge of the associated variables enables behavior to be understood, predicted, and changed (Bandura, 1989, 1993). Capability beliefs are the cognitive evaluation or product of one’s: (a) performance achievements, (b) comparative observations of others, (c) social persuasions, and (d) personal factors affecting state while performing the behavior, and level of perceived self-efficacy is thought to synonymously affect self-regulation and level of motivation (Bandura, 2001). Past research has shown that self-efficacy helps predict action potential through cognitive processes that facilitate: (a) the forming of behavior intentions, (b) develop action plans, and (c) the initiate the action (Schwarzer, 2008). Exercise self-efficacy is defined as an individual’s confidence in their ability to exercise regularly (Bandura, 2006). Bandura (2006)
states that self-efficacy influences the level of one’s motivation, commitment, and exerted effort in goal achievement. Therefore, exercise self-efficacy should be a strong predictor of current and future levels of physical activity behavior (Bandura, 2006; Holloway & Watson, 2002; McAuley & Blissmer, 2000; Schwarzer, 1992). Additionally, Marcus, Selby, Niaura, and Rossi (1992) found that as individuals’ self-efficacy increases (i.e., those who have increased confidence in their ability) so do their motivation, commitment, and accuracy in self-evaluation of ability.

Outcome Expectancies. Bandura (1977, 1986) describes outcome expectancies as personal psychosocial predictors that are highly associated with self-efficacy. Bandura (1997) explains that individuals with higher self-efficacy and promising outcome expectations will have better self-regulatory strategies that are essential for maintaining behavior. Bandura believes self-efficacy causally influences outcome expectancies, but outcome expectancies do not causally influence self-efficacy. According to Bandura (1977, 1986), efficacy expectations are distinguished from outcome expectations for this reason. He defines outcome expectancies as an estimate or guess that a given behavior will produce a certain result; while efficacy expectations are the belief in successfully execute the behavior needed to produce those outcomes (Anderson et al., 2007; Bandura, 1977; Williams, 2010; Wójcicki et al., 2009). That is, individuals may believe that a particular behavior will produce certain outcomes, but expecting an outcome will not influence behavior if doubt in capability exists (Bandura, 1977).

However, recently this rationality has been heavily debated. Williams (2010) argues that Bandura’s belief implies that failures to engage in new behaviors are simply the result of belief incapacities rather than insufficient values placed on the outcomes, but that it does not account for real life alternative outcomes that may have serious health consequences later in life such as chronic diseases. For instance, research has shown that when individuals are deciding whether or
not to engage in certain behaviors (e.g., physical activity), rationalizing what they stand to gain (e.g., healthy and longer life) or lose (e.g., leisure time) by participation is considered (Williams et al., 2005). Therefore, it might be beneficial to recognize outcome expectations as important variables involving choice selection in human behavior.

Purportedly, outcome expectations are based largely on self-efficacy and age (Williams et al., 2005). Empirical evidence testing older adults has shown a significant relationship between expectant outcomes and physical activity behavior, but in studies involving young adults outcome expectations had a small total effect on physical activity (Conn, 1998; Rovniak, Anderson, Winett, & Stephens, 2002). Moreover, other studies involving older adults actually reported outcome expectancies to have a greater predictive value than self-efficacy (Jette et al., 1998; Resnick, 1998). These findings might be explained through the realization that older adults place a higher value on consequences of physical activity behavior, since the benefits of physical activity and the negative consequences of physical inactivity are more easily objectified through outcome proximity. Therefore, the interaction between beliefs that regular physical activity produces certain benefits and the subjective “value” that is placed on those benefits is independently measured as outcome expectancies. However, through reciprocal causation the value that is placed on the perceived benefits and the expected outcomes associated with regular physical activity might depend heavily on other interacting predictors, such as social support (Petosa, Suminski, & Hertz, 2003).

**Environmental Factors**

Social support is the most analyzed environmental psychosocial predictors within Bandura’s SCT. Bandura (1989) argues that individuals are both products and producers of their environment, and behavior is profoundly influenced by both encouraging and impeding factors.
That is, an individual’s behavior can determine aspects within their environment, and their environment can in turn modify their behavior. These social influences convey information and activate reactions through modeling, instruction, and social persuasion (Bandura, 1986). Social support is defined as support for a given behavior from important others (Anderson et al., 2007). This network primarily consists of the social support given by others (e.g., family and friends), and is commonly thought as a precursor to self-efficacy (Anderson et al., 2007; Rovniak et al., 2002). This belief is rationalized by the understanding that through social support, behavior can be encouraged or hindered. Therefore, having a well-established social support network can increase self-efficacy, while simultaneously supplying an accountability crutch and encouragement when environmental obstacles arise (e.g., schedule conflicts and weather).

By encouraging, relating, and holding responsible, supportive social networks can significantly influence behavior (Gruber, 2008). However, if individuals have little to no social support system, their exercise self-efficacy has a greater potential to decrease. For instance, the transition from high school to college might result in many changes to an established support network and require seeking support from less familiar sources. This drastic change has the potential to greatly affect who will be supplying support, and might be why weight gain in the first two years of college is becoming a significant concern in young adults (Hoffman et al., 2006; Racette et al., 2005).

Apart from the health benefits of physical activity, research has also repeatedly shown that having a strong social support network by itself enhances individuals’ psychological well-being (Lincoln, 2000). These additional health benefits are why social support has been identified as an important variable in the promotion of physical activity (Anderson et al., 2007; Gruber, 2008; Sallis, Grossman, Pinski, Jefferson, & Nader, 1987). Rovniak et al. (2002) found
that having a supportive environment that encourages physical activity helps facilitate the initiation and maintenance of participation. In the higher learning environment, social support for physical activity from friends and peers is often associated with college students perceiving positive experiences and expectations (Gruber, 2008; Petosa et al., 2003). However, health trends indicate that college students’ social network may not be supporting this healthy behavior, and research evidence shows that lower rates of physical activity are common changes in behavior patterns that occur at a higher rate during this transition (Carlson, Fulton, Schoenborn, & Loustalot, 2010; Caspersen et al., 2000; Dowda, Ainsworth, Addy, Saunders, & Riner, 2003; Racette et al., 2005).

Since health trends and research both indicate that college students’ current social support networks may be inadequately supporting physical activity behavior or possibly even hindering it practice, it would also indicate that modifying their social support networks could possibly reverse this trend. Bandura (1989) states that expectations, beliefs, competencies, and preferences can be modified by social influences that convey information and trigger emotional reactions through modeling, direction, and persuasion. Knowing that individuals chose whom they interact with and what activities in which they participate from a vast range of possibilities, altering their social support network proposes a difficult challenge and theoretically calls for a change in social norms (Bandura, 1989). For instance, there are numerous ways college students can participate in physical activity (e.g., intramural sports, club teams, recreation centers, and student fitness themed organizations), but those potential environments will remain potential until they are activated by persuasive influences (e.g., internal or external). Therefore, by analyzing and comparing what social variables best predict college students’ physical activity
behavior, it might be plausible to manipulate or enhance those support systems in order to initiate action, produce motivation, and improve self-regulatory participation.
APPENDIX B

DEMOGRAPHIC ITEMS
Demographic Items

Thank you for agreeing to participate in the survey questionnaire entitled, “A Social Cognitive Perspective of College Students’ Physical Activity”.

Instructions: Please answer the following background / demographic questions as they describe you.

1. Age:
   Years old

2. Height: (e.g., 5 feet 4 inches = 64)
   Inches

3. Approximate Weight:
   Pounds

4. Waist Circumference: (e.g., 28 inch waist)
   To determine your Waist Circumference, locate the upper hipbone and place a measuring tape around the abdomen (ensuring that the tape measure is horizontal). The tape measure should be snug but should not cause compressions on the skin.
   Inches

5. Sex:
   - Male
   - Female

6. Classification Status:
   - Freshman
   - Sophomore
   - Junior
   - Senior

7. Academic Major:
8. Ethnicity:
- African American/Black
- Asian
- Caucasian/White
- Hispanic/Latino
- Middle Eastern/North African
- Multiracial
- Native American/American Indian/Native Alaskan
- Native Hawaiian/Other Pacific Islander
- Other

9. If you regularly exercise, why? In 3 words or less indicate what your goal is? (If you don’t simply answer “No”)


APPENDIX C

EXERCISE SELF-EFFICACY (ESE)
Instructions: Please complete the next block of questions by indicating, on this 11-point scale ranging from “I cannot do this activity at all” (0) to “I am certain that I can do this activity successfully” (10), the extent to how sure you are that you can get yourself to exercise regularly (most days of the week).

I can get myself to exercise regularly…

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<td>When I am feeling under pressure from work</td>
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APPENDIX D

MULTIDIMENSIONAL OUTCOME EXPECTATIONS FOR EXERCISE SCALE (MOEES)
**MOEES**

Instructions: Please complete the next block of questions by indicating, on this 5-point scale ranging from “Strongly Disagree” (1) to “Strongly Agree” (5), what degree you agree with the statements below about expectations for exercise. Record your responses by selecting the appropriate circle.

Exercise will...

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<th>Strongly Disagree 1</th>
<th>Disagree 2</th>
<th>Neither Agree nor Disagree 3</th>
<th>Agree 4</th>
<th>Strongly Agree 5</th>
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<td>Improve my ability to perform daily activities.</td>
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<td>Improve my social standing.</td>
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<td>Improve my overall body functioning.</td>
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<td>Help manage my stress.</td>
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<td>Improve my mood.</td>
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<td>Make me more at ease with people.</td>
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<td>Aid in weight control.</td>
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<td>Improve my psychological state.</td>
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<td>Strengthen my bones.</td>
<td></td>
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<tr>
<td>Increase my muscle strength.</td>
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<tr>
<td>Provide companionship.</td>
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<tr>
<td>Improve the functioning of my cardiovascular system.</td>
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<tr>
<td>Increase my mental alertness.</td>
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<tr>
<td>Increase my acceptance by others.</td>
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<tr>
<td>Give me a sense of personal accomplishment.</td>
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<tr>
<td>Improve my health-related quality of life</td>
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</tbody>
</table>
APPENDIX E

SOCIAL SUPPORT FOR EXERCISE HABITS SCALE (SSEH)
SSEH

Instructions: Please complete the next block of questions by indicating, on a 5-point scale ranging from “none” (0) to “very often” (4), the frequency with which family or friends have done or said what is described during the previous 3 months.

My Family or Friends....

<table>
<thead>
<tr>
<th>Activity</th>
<th>None 0</th>
<th>Rarely 1</th>
<th>Sometimes 2</th>
<th>Often 3</th>
<th>Very Often 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercised with me.</td>
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<tr>
<td>Gave me encouragement to stick with my exercise program.</td>
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<tr>
<td>Changed their schedule so we could exercise together.</td>
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<tr>
<td>Offered to exercise with me.</td>
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<tr>
<td>Gave me helpful reminders to exercise.</td>
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<tr>
<td>Got angry at me for exercising.</td>
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<tr>
<td>Planned for exercise on recreational outings.</td>
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<tr>
<td>Discussed exercise with me.</td>
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<tr>
<td>Talked about how much they liked to exercise.</td>
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<tr>
<td>Criticized me or made fun of me for exercising.</td>
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<tr>
<td>Helped plan activities around my exercise.</td>
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<tr>
<td>Asked me for ideas on how they can get more exercise.</td>
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<tr>
<td>Took over chores so I had more time to exercise.</td>
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<tr>
<td>Made positive comments about my physical appearance,</td>
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<tr>
<td>Gave me rewards for exercising.</td>
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</tr>
</tbody>
</table>
APPENDIX F

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE SHORT FORM (IPAQ-SF)
IPAQ-SF

Instructions: Please complete the next block of questions by selecting the response that best applies to your activity behavior.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like aerobic dance, biking faster than 10 mph, fast dancing, hiking uphill, jumping rope, heavy lifting, martial arts, jogging or running, sports with a lot of running, swimming laps, or tennis (singles)?
   - 0 days, No vigorous aerobic activities --> Skip to question 3
   - 1 day
   - 2 days
   - 3 days
   - 4 days
   - 5 day
   - More than 5 days

2. How much time did you usually spend doing vigorous physical activities on one of those days?
   - More than 60 minutes
   - 60 minutes
   - 45-59 minutes
   - 30-44 minutes
   - 20-29 minutes
   - 10-19 minutes
   - Less than 10 minutes
   - Don't know/Not sure
Think about all the moderate physical activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities. For example, ballroom dancing, biking at a regular pace, canoeing, general gardening, sports where catch and throw, tennis (doubles), walking briskly, water aerobics? Do not include general walking.

- 0 days, No moderate aerobic activities --> Skip to question 5
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- More than 5 days

4. How much time did you usually spend doing moderate physical activities on one of those days?

- More than 60 minutes
- 60 minutes
- 45-59 minutes
- 30-44 minutes
- 20-29 minutes
- 10-19 minutes
- Less than 10 minutes
- Don't know/Not sure
Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

- 0 days, No walking --> Skip to question 7
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- More than 5 days

6. How much time did you usually spend walking on one of those days?

- More than 90 minutes
- 60-90 minutes
- 30-60 minutes
- Less than 30 minutes
- Don't know/Not sure

This question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television (Not Sleeping).

During the last 7 days, how much time did you spend sitting on a weekday? (i.e., time spent sitting per day average) (e.g., 5 hours and 30 minutes = 5.5 hours)

7. Hours per day

58
Think about all the muscle strengthening activities that you did in the last 7 days. Muscle strengthening activities refer to activities that make your muscles do more work than usual using a variety of exercises and equipment, and include all the major muscle groups such as legs, hips, back, chest, stomach, shoulders, and arms. Think only about those activities you repeated 8 to 12 times per session/set.

8. During the last 7 days, on how many days did you do muscle strengthening activities (e.g., resistance training [weights or bands], Pilates, or yoga)?

- 0 days, No muscle strengthening activities
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- More than 5 days

9. If you engaged in muscle strengthening activities, did you work the following muscle groups in the last 7 days?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don't know/Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legs</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Hips</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Back</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Chest</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Stomach</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Shoulders</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Arms</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
APPENDIX G

EMAIL BANK SURVEY
PRIZE TRACKER SURVEY LINK

In order to ensure confidentiality, the follow link at the bottom of this page will take you to another data collection survey. This separate data collection survey will only be used as a database to draw gift card winners and will not be linked to your responses in this survey questionnaire.

IMPORTANT: You need to right click on the direct web link located at the end of this page and open this link in a New Tab. See below picture.

After the New survey opens in a new tab, click on the next tab to end this survey. See below picture.

Then you will have completed this survey and can click over to the new tab so that you can complete the final needed response (i.e., how you will be entered into the gift card drawings). See below picture.
Your Anonymous Survey Link:
https://unt.qualtrics.com/SE/?SID=SV_cHnqVOpyV7usJ01
You can copy this link, then paste it into an email or website.

Note: This will not track identifying information. If needed, try our Survey Mailer

Please enter your email address. This is how you will be contacted if you win one of the gift cards

__________________________________
APPENDIX H

RECRUITMENT EMAIL
UNT Student,

UNT strives to promote research, and your participation is needed in research studies. This email is an opportunity for you to participate in current research.

By participating in the study you will be entered into a lottery for one of forty $10.00 gift cards (1:10 odds). One out of ten participants will win. That is, there will be 1 gift card drawn for every 10 participants up to 400 participants. Your entry into the drawing(s) will be contingent on your accurate completion of the entire questionnaire.

Attached to this email is your copy of your informed consent notice.
APPENDIX I

INFORMED CONSENT NOTICE
Informed Consent Notice

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

**Title of Study:** Psychosocial predictors of college students' physical activity behavior and health-related quality of life: A social cognitive perspective.

**Student Investigator:** Gene L. Farren, B.S., University of North Texas (UNT) Department of Kinesiology, Health Promotion, and Recreation. **Supervising Investigators:** Tao Zhang, PhD., Scott Martin, PhD., and Katherine Thomas, PhD, UNT Department of Kinesiology, Health Promotion, and Recreation.

**Purpose of the Study:** You are being asked to participate in a research study whose purpose is to investigate the relationship among psychosocial predictors (i.e., exercise self-efficacy, outcome expectancies for exercise, social support for exercise from family and friends) and health-related quality of life and physical activity behaviors based on the social cognitive theory.

**Study Procedures:** You will be asked to complete a survey questionnaire with 67 questions (with some sub-questions, 108 questions in total) that should take you approximately 15-30 minutes to complete. Your answers will reflect your current: (a) demographic information, (b) physical activity behavior, (c) belief in capability to exercise regularly, (d) perceived expectations of exercise, (e) received and perceived social support for exercise, (f) health-related quality of life, and (g) sedentary behavior. *It is imperative that you answer these questions honestly and with your best judgment. There are no wrong answers as long as they are truthful.*

**Foreseeable Risks:** No foreseeable risks are involved in this study.

**Benefits to the Participants or Others:** This study may be of any direct benefit to you, and we hope to learn more about physical activity behavior and its predictors. Knowing which predictors have greater value might indicate what variables could be manipulated in order to elicit regular physical activity. Hopefully the knowledge gained from this study may benefit others and contribute to physical activity education.

**Compensation for Participants:** By participating in the study you will be entered into a drawing for a $10.00 gift card. Odds of winning are 1:10. That is, there will be one drawing for every ten participants up to 400 participants (i.e., 10 participants = one drawing and 400+ participants = forty drawings). Your entry into the drawing(s) will be contingent on your completion of the entire questionnaire. Within one week of completing data collection or before August 2013, the drawing(s) will take place. A congratulatory email will then be sent to the selected participant(s) informing them where and when they can collect the gift card(s).
Procedures for Maintaining Confidentiality of Research Records: In order to ensure your responses are kept confidential and anonymous, no identifiable information will be collected within the survey questionnaire that contains your responses. Instead, after you have completed that survey an additional web link will bring your browser to another survey where you may enter your email address. This additional survey will not be linked to your responses in any way; thus, ensures that your answers cannot be linked to any identifiable information (i.e., email addresses). All data will be kept in a secure locked location. Since no identifiable information will be linked to your responses, any publications or presentations regarding this study will be completely confidential and anonymous.

Questions about the Study: If you have any questions about the study, you may contact Gene Farren at gene.farren@unt.edu or Dr. Tao Zhang at tao.zhang@unt.edu or Dr. Scott Martin at scott.martin@unt.edu or Dr. Katherine Thomas at Katherine.thomas@unt.edu

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants’ Rights:
Your participation in the survey confirms that you have read all of the above and that you agree to all of the following:

- **Gene Farren** has explained the study to you and you have had an opportunity to contact him/her with any questions about the study. You have been informed of the possible benefits and the potential risks and/or discomforts of the study.

- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.

- Your decision whether to participate or to withdraw from the study will have no effect on your grade or standing in this course.

- You understand why the study is being conducted and how it will be performed.

- You understand your rights as a research participant and you voluntarily consent to participate in this study.

- You understand you were emailed a copy of this form for your records.
APPENDIX J

DIRECT WEB LINK TO QUESTIONNAIRE
If you would like to participate, please click on the above or below link.

**Your Anonymous Survey Link:**

https://unt.qualtrics.com/SE/?SID=SV_8kyjZmGaCuNeRk9

You can copy this link, and then paste it into an email or website.

Note: This will not track identifying information. If needed, try our Survey Mailer
COMPREHENSIVE REFERENCE LIST


http://www.cdc.gov/nchs/data/hus/hus11.pdf


