

# **SOCIAL COGNITIVE DETERMINANTS OF PHYSICAL ACTIVITY IN A PREDOMINANTLY HISPANIC COLLEGE POPULATION**

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## **Abstract**

The purpose of this study was to assess the general level of physical activity (PA) among predominantly Hispanic college population. In addition, the study examined the relationships between the Social Cognitive Theory (SCT) constructs and PA. One hundred participants completed the questionnaire in regard to PA and SCT. The results of this study showed that 59% of the sample met recommendations for PA. Furthermore, *self-efficacy* was the only significant predictor of PA METS,  $\beta = .35, p < .01$ . This study helps understand the relationship between the SCT constructs and PA, suggesting that maintaining the SCT processes will lead to regular PA. Thus, encouraging and targeting PA together with cognitive changes might be of great interest for future research.

**Key words:** physical activity, SCT, college students, Hispanics

## **Introduction**

The American Heart Association (AHA) and the American College of Sports Medicine (ACSM) suggest at least 30 min of moderate physical activity (PA) at least 5 days a week or 20 min of vigorous PA at least 3 days a week (Haskell et al., 2007). Moderate PA is defined as any activity that takes moderate physical effort and makes a person breathe somewhat harder than normal (e.g. walking, cleaning), whereas vigorous PA is defined as any activity that takes hard physical effort and makes a person breathe much harder than normal (e.g. jogging, skiing) (Booth, 2000). Combinations of moderate and vigorous PA are also appropriate. For instance, a person may be moderately physically active on 2 days a week for at least 30 min per day in addition to 2 days of vigorous PA for at least 20 min per day (Booth, 2000).

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The relationship between PA and disease is unambiguous and lack of PA in the general population has become a major public health concern (Petosa, Suminski, & Hertz, 2003). Physical activity helps metabolism and immune function, minimizes risk factors for many heart diseases, including diabetes and high blood pressure, and is also associated with decreased risk of morbidity and mortality rates from cardiovascular disease (Kujala, Kaprio, Sarna, & Koskenvuo, 1998). Even though the health benefits of PA are numerous, most adults are not sufficiently physically active (Insel & Roth, 2002; Pratt, Macera, & Blanton, 1999). In fact, many Americans live sedentary lifestyles with approximately one-quarter reporting they engage in no PA at all and about 25% meeting the recommended levels of PA (Centers for Disease Control and Prevention [CDC], 2001).

Studies show that levels of PA drop abruptly from high school to college years and beyond. For example, approximately 65% of high school students engage in vigorous PA, compared to 32% of 18-24 year-olds and 23% of adults. A similar trend has been reported for moderate PA showing that approximately 27% of high school students engage in moderate PA, compared to 17% of 18-24 year-olds and 15% of adults (Rovniak, Eileen & Winett, 2002). This is also true for college students where studies show surprisingly low participation in recommended PA, ranging from 40-55% (Petosa et al., 2003; Suminski, Petosa, Utter, & Zhang, 2002). This means that only half of college students are sufficiently physically active and the other half are not getting enough PA. This result is troubling because studies have shown that PA decreases over the lifespan (Bradley, McMurray, Harrell & Deng, 2000; Caspersen, Pereira & Curran, 2000; McMurray et al., 2000). Therefore, although increased PA would benefit all age groups, it is especially important in young adults because studies show that they become less active as they get older, and because habits learned early in life tend to persist into adulthood (Department of Health and Human Services [DHHS], 1996).

#### *Participation in PA among Hispanics*

Rates of participation in PA are higher in white adolescents compared to Black and Hispanics (Pratt et al., 1999). In addition, more white adults meet current recommendations for PA than do Black and Hispanics (Pratt et al., 1999). In a study among a predominantly Hispanic college population, Magoc and Tomaka (2006) reported that even though participation in some level of PA among college students (the majority Hispanic) was high (61%), the majority of students who reported some level of PA (69%) did not meet the recommendations for PA.

Although studies are few, researchers have identified differences between Hispanic and Anglo populations across a number of dimensions relating to physical activity. Overall, these studies have suggested that although they have favorable attitudes toward PA, Hispanic populations tend to participate in leisure time PA less often and less frequently than do their Anglo counterparts. For example, Hovell et al. (1991) reported that, on average, Hispanic adults walk for only 48 minutes per week and engage in vigorous PA less than 2 times a week. Similarly, Crespo, Keteyian, Heath, & Sempos (1996) reported that Hispanics were among the most inactive people in the nation with 33% of Mexican American men and 46% of Mexican American women not participating in any significant leisure time PA. The percentages for women are particularly striking since women and Mexican-Americans are at increased risk of diabetes. Mouton, Calmbach, Dhanda, Espino, & Hazuda (2000) have also shown that Mexican Americans are less active and have lower levels of PA than European Americans. Dunn and Wang (2003) also reported that Hispanic and African-American college students were less likely to engage in PA than were White students.

The college setting represents an appropriate time for developing and promoting physical activity, particularly since this time represents the transition to adulthood and independence, and it is a time when parents and schools usually have little or no control over PA behaviors (Hoerr, Bokram, Lugo, Bivins, & Keast, 2002). Habits developed during college will likely persist into later adulthood. Moreover, as this generation moves into the workforce, many will enter

occupations requiring little physical exertion. Accordingly, the Hispanic college-age population is an appropriate group for the development of effective ways to help this population engage in PA on regular basis and learn skills that will keep them active throughout the lifespan.

### *Social Cognitive Theory*

In order to develop more effective physical activity interventions, it is crucial to incorporate theoretical approaches into interventions that adequately explain and predict PA (Baranowski, Anderson, & Carmack 1998; Rovniak et al., 2002). Social Cognitive Theory (SCT) has been one of the most widely used Behavioral Change Theories, and its constructs provide a useful framework in the prediction of PA behavior and the design of behavioral interventions.

Glanz, Lewis, and Rimer (2002) explain why SCT is relevant to health education and health behavior programs. First, SCT is based on a dynamic relationship between environment, personal factors, and behavior (Allison, Dwyer, & Makin 1999; Glanz et al., 2002). According to SCT, an individual's behavior is determined by each of these three factors. And second, the constructs from SCT suggest many possibilities for behavioral research and practice in health education. The key SCT determinants of PA include: self-efficacy, self-regulation, social support, outcome expectations and expectancies, environmental factors, and behavioral capability (Bandura, 1997; Rovniak et al., 2002).

Self-efficacy is described as one's confidence in performing a particular behavior (Glanz et al., 2002). It represents a central component of SCT and an important personal determinant of human behavior. It has also been defined as somebody's beliefs about their ability to engage in a certain behavior that will lead to expected outcomes (Ryan & Dzewaltowski, 2002). Depending on self-efficacy beliefs, a decision will be made whether a behavior will be adopted and maintained.

Self-regulation refers to motivational and self-regulatory skills (Bandura, 1997). Self-regulation allows a person to set goals, track his or her progress, and evaluate his or her capabilities to perform behaviors in given situations. According to Bandura (1997), people cannot influence their motivation and actions without an adequate attention to their performance. Thus, being able to set goals as well as monitor their progress can help people increase their motivation toward certain behaviors.

Social Support represents a form of verbal or behavioral actions in support of a given behavior (Bandura, 1997). There are usually four types of social support: instrumental, informational, emotional, and appraisal. All types of social support aid in behavioral processes by physical actions (instrumental), helpful information (informational), affective support (emotional), or reinforcement (appraisal).

People tend to adopt actions that will most likely produce positive outcomes and usually tend to avoid actions that will bring unrewarding outcomes (Bandura, 2004). This has been explained through outcome expectations. In addition to what people expect their action to produce, people also place values on particular outcomes (Baranowski, Perry, & Parcel 2004). This is further defined by outcome expectancies. Thus, people are more likely to change their behavior if they believed the outcome would match their expectations and if they valued a specific outcome.

Glanz et al. (2002) defined the environmental factors in SCT as factors physically external to the person, but which can affect a person's behavior and "situation" as a person's perception of the environment. One of the most important environmental determinants of PA is physical safety. Ryan and Dzewaltowski (2002) suggest that selecting and creating the environment that supports desired behavior is an important strategy. An unsafe environment can decrease an individual's motivation to be physically active.

Behavioral Capability relates to knowledge and skills of a certain behavior. It has been explained that if a person needs to perform a certain behavior, he or she must know what the behavior is (knowledge) and how to do it (skill) (Glanz et al., 2002).

Overall, studies have found positive relations between SCT variables and PA (Rovniak et al., 2002; Petosa et al, 2003; Wallace, Buckworth, Kirby, & Sherman, 2000; Leslie, Owen, Salmon, Bauman, Sallis, & Kai Lo, 1999), also suggesting that some constructs such as self-efficacy, self-regulation, and social support show a stronger relationship with PA than some others, such as outcome expectations. Even though theory-based programs and interventions contribute to a variety of positive outcomes and can be effective for increasing people's level of PA, knowledge about PA, attitudes, and fitness level, more research is needed, so that definite conclusion and decisions can be made regarding correlates and predictors of PA, especially among diverse population.

Therefore, the overall aim of this study was to assess the general level of physical activity in Hispanic college population. In addition, this study examined the relationships between PA and SCT constructs, derived from Bandura's SCT, using measures from previous research. We expected SCT constructs to positively correlate with PA. It was also hypothesized that the intercorrelations among the SCT constructs would be positive

## Method

### *Participants and Setting.*

The participants in this study were 100 part- or full-time currently enrolled male and female students from a large southwestern university in the US with a large Hispanic enrollment. All participants were recruited through classroom settings and completed the cross-sectional survey.

### *Measures*

*Demographic variables.* Demographic variables included self-reported gender, ethnicity, class, height, and weight.

*International Physical Activity Questionnaire.* The short version of the International Physical Activity Questionnaire (IPAQ) is structured to provide separate scores on three specific types of physical activities (walking, moderate-intensity, and vigorous-intensity) within four domains, including leisure time PA, domestic and gardening activities, work-related PA, and transport-related PA (Booth, 2000). This study used only measures of moderate and vigorous leisure time PA.

*Self-Regulation Scales.* The Exercise Goal-Setting Scale (EGS) and The Exercise Planning and Scheduling Scale (EPS) measured students' self-regulation in regard to PA (Rovniak et al., 2002). Rovniak et al. (2002) showed good reliabilities for these scales in a predominantly white student population (.89 and .87, respectively). In the present sample, we also found good reliabilities for these scales (.92 and .76, respectively).

*Social Support Scales.* The Family and Friend Support for Exercise Habits Scales assessed social support during the past three months that students have received from friends and family members (Sallis, Grossman, Pinski, Patterson, & Nader, 1987). Petosa et al. (2003) showed good reliabilities for these scales in a predominantly white college population (.61 and .91, respectively). In the present sample, we also found good reliabilities for these scales (.89 and .90, respectively).

*Self-Efficacy Scale.* The Self-Efficacy for Exercise Behavior Scale assessed students' self-efficacy in regard to PA (Sallis, Pinski, Grossman, Patterson, & Nader, 1988). Petosa et al. (2003) showed good reliability for this scale in a predominantly white college population (.97). In the present sample, we also found good reliability for this scale (.91).

*Outcome Expectations and Expectancies Scale.* The self-report questionnaire assessed students' outcome expectations and expectancies in regard to PA (Steinhardt & Dishman, 1989). Petosa et al. (2003) showed good reliability for this scale in a predominantly white college population (.74). In the present sample, we also found good reliability for this scale (.76). We further factor analyzed this scale to examine different sources of expectancies. Specifically, principal axis factoring with oblimin rotation to simple solution revealed three expectancy factors: Psychological Effects, Image, and Competition. Eight items loaded on the psychological effects factor and all reflected the expectancy that PA would reduce stress, increase energy, or improve mood. Five items loaded on the image factor and all reflected the expectancy that PA would enhance attractiveness or improve body image. Finally, six items loaded on the competition factor and all reflected the expectancy that PA would enhance competitive performance.

### *Procedures*

Participants for this study were largely recruited through regular classroom meetings and activities, with most receiving extra course credit for participation. All participants completed informed consent forms prior to completing the questionnaires. In total, the survey took approximately 20 minutes to complete.

## Results

### *Descriptive Analysis*

*Demographics and Descriptive Statistics.* Demographic data for the sample ( $n = 100$ ) is presented in Table 1. The sample primarily consisted of junior and senior level students of predominantly Hispanic origin (82%). A slightly higher percentage of women participated in the study (59%) than men. The sample had an average BMI of 26.5 ( $\text{kg}/\text{m}^2$ ). Men and women significantly differed on two variables: Height and weight (both  $F(1,99) > 18.71, p < .001$ ). Men were significantly taller than women ( $M_s$  70.32 and 63.98, respectively) and heavier ( $M_s$  186.15 and 153.91, respectively). Majority of students self-rated their physical health as being "good" to "fair". About 54% of students self-rated their psychological health as being "good", while about 47% of students self-rated their diet as being "fair".

Table 1  
*Descriptive Statistics for Study Variables*

	Mean (SD)/%	Men Mean (SD)/%	Women Mean (SD)/%	<i>F</i>
Hispanic	82.0%	41.0%	59.0%	.726
Class	3.28 (.75)	3.22 (.76)	3.32 (.75)	.446
Height (in)	66.63 (4.20)	70.32 (2.99)	63.98 (2.66)	122.18**
Weight (lbs)	167.07 (39.43)	186.15 (31.63)	153.91 (39.11)	18.71**
BMI	26.50 (5.43)	26.47 (3.81)	26.52 (6.36)	.00
Self-Rated Physical Health (1-excellent; 5-very poor)	2.34 (.81)	2.24 (.73)	2.41 (.85)	.99
Self-Rated Psychological Health (1-excellent; 5-very poor)	2.04 (.76)	2.07 (.75)	2.02 (.78)	.13
Diet (1-excellent; 5-very poor)	2.77 (.85)	2.90 (.83)	2.68 (.86)	1.69

Note: \*  $p < .05$       \*\*  $p < .001$

Table 2 shows means and standard deviations for main outcome (PA and SCT) variables, as well as reliability coefficients for the latter. As shown, all SCT scales showed good levels of reliability with the exception of expectancies and self-regulation for plans which were somewhat lower, but still acceptable. On average, students reported exercising about 3 times per week at vigorous intensity and about the same number of times per week at moderate intensity. They also reported achieving over 6000 total PA METS per week. Men and women differed on the measures of vigorous PA  $F(1,99) = 5.44, p < .05$ , PA METS  $F(1,99) = 6.19, p < .05$ , Self-Efficacy  $F(1,99) = 6.07, p < .05$ , Expectancies,  $F(1,99) = 11.14, p < .01$ , and Goals  $F(1,99) = 10.79, p < .01$ .

Table 2  
*Descriptive Statistics for Main Study Outcome Variables*

Variables	Mean (SD)	Men Means (SD)	Women Means (SD)	<i>F</i>
<b>Physical Activity</b>				
Vigorous Days	2.81 (1.67)	3.27 (1.34)	2.49 (1.81)	5.44*
Moderate Days	3.21 (1.99)	3.34 (1.96)	3.12 (2.03)	.30
PA METS	6454.79 (4980)	7903.79 (4956)	5447.85 (4784)	6.19*
<b>SCT Constructs</b>				
Self Efficacy ( $\alpha = .91$ )	44.32 (9.58)	47.07 (8.43)	42.41 (9.93)	6.07*
Social Support ( $\alpha = .89$ )	52.25 (15.42)	51.05 (14.65)	53.08 (16.01)	.42
Expectancies ( $\alpha = .74$ )	165.97 (51.71)	185.61 (44.26)	152.09 (52.42)	11.14**
Goals ( $\alpha = .92$ )	31.66 (9.34)	35.17 (7.42)	29.22 (9.80)	10.79**
Plans ( $\alpha = .76$ )	28.81 (7.29)	29.73 (6.67)	28.17 (7.67)	1.11

Note: \*  $p < .05$       \*\*  $p < .01$

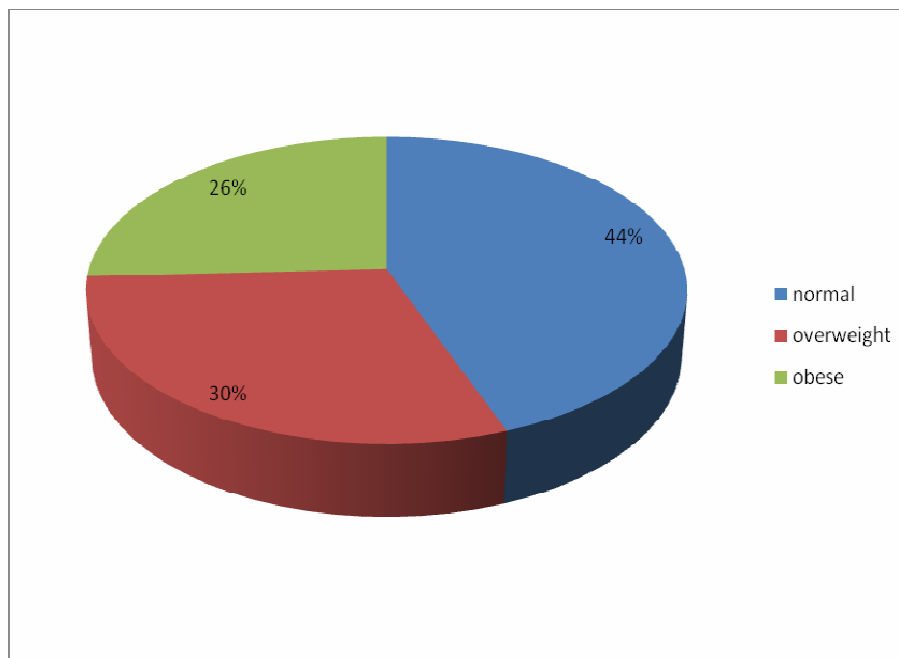
The study also examined participation in the recommended levels of PA using definitions given by the AHA and the ACSM suggesting at least 30 min of moderate PA at least 5 days a week or 20 min of vigorous PA at least 3 days a week (Haskell et al., 2007). As shown in Table 3, 59% of the sample met recommendations for PA. However, 41% of the sample failed to meet definition for recommended level of PA.

Table 3  
*PA of College Students Based on Recommended Levels*

Levels of PA	Male	Female	Total
Insufficiently Active	11%	30%	41%
Sufficiently Active	30%	29%	59%

In addition, the study examined the number of persons who were overweight or obese, using BMI guidelines established by the American College of Sports Medicine (ACSM, 2000). Participants with BMI of 25 ( $\text{kg}/\text{m}^2$ ) or greater were classified overweight, those with BMI of 30 ( $\text{kg}/\text{m}^2$ ) or greater were classified obese, and participants with BMI between 18 ( $\text{kg}/\text{m}^2$ ) and 25 ( $\text{kg}/\text{m}^2$ ) were classified normal. Figure 1 shows the breakdown of participants into the various categories. As shown, 56% of the sample was overweight, including 26% of those being classified as obese. The rest of the sample (44%) was classified as normal weight.

Figure 1. Percentage of Students in Identified Weight Categories



*Primary Analysis: Prediction of Physical Activity*

The primary analysis for this study examined demographic and SCT variables in relation to PA. Table 4 shows the Pearson correlations between the demographic and SCT variables and total week PA METS. The correlations between demographic and SCT variables and PA ranged from negative moderate ( $r = -0.22$ ) to positive moderate ( $r = 0.46$ ) and all were statistically significant. The results showed that gender related negatively to most PA and SCT variables indicating that women participated less in PA, had less self-efficacy, lower self-regulation, lower outcome expectancies, and received less social support. As expected, the intercorrelations among the SCT variables were moderate and all were positive. Also, the SCT variables correlated with PA in expected ways.

Hierarchical multiple regression analysis examined the multivariate relationships among PA METS and SCT variables. For this analysis, gender and BMI were entered into the regression equation predicting PA METS on the first step and SCT variables having a significant univariate association were entered on the second step. The results of this analysis were significant, adjusted  $R^2 = .21$ ,  $F(7,89) = 4.58$ ,  $p < .001$ . Results also indicated that the addition of the SCT variables added significantly to the prediction of PA METS,  $\Delta R^2 = .16$ ,  $F(5,89) = 3.81$ ,  $p < .01$ . Examination of the standardized beta coefficients revealed that self-efficacy was the only significant predictor of PA METS,  $\beta = .35$ ,  $p < .01$ . It was interesting to note that the coefficients for Gender and BMI were no longer significant when self-efficacy was entered into the equation.



Table 4  
*Demographic and SCT Variables in Relation to PA METS*

	PA METS	Gender	BMI	SE	SSF	SRG	SRP	OEV	OEP
Gender	-0.24*								
BMI	-0.22*	0.00							
SE	0.46**	-0.24*	-0.19						
SSF	0.22*	-0.21*	-0.17	0.32**					
SRG	0.36**	-0.31*	-0.14	0.66**	0.38**				
SRP	0.26**	-0.11	-0.08	0.55**	0.39**	0.59**			
OEV	0.28**	-0.32**	-0.19	0.48**	0.42**	0.64**	0.59**		
OEP	0.31**	-0.21*	-0.21*	0.49**	0.31**	0.60**	0.58**	0.91**	
OEBI	0.26**	-0.20*	-0.18	0.47**	0.31**	0.44**	0.46**	0.71**	0.57**

Note: \*  $p < .05$     \*\*  $p < .01$

Abbreviations: Total Physical Activity METS (PA METS); Self Efficacy (SE); Social Support Friend (SSF); Self Regulation Goals (SRG); Self Regulation Plans (SRP); Outcome Expectancy Value (OEV); Outcome Expectancy Psychological (OEP); Outcome Expectancy Body Image (OEBI)

Furthermore, we created three PA groups based on students' PA participation level (low, moderate, high). Table 5 shows the results of a series of one-way analysis of variance. One-way ANOVA revealed that there were significant differences in gender, BMI, and SCT variables among the three PA groups.

Table 5  
*BMI and SCT Variables in Relation to 3 PA Groups*

	Physical Low n = 4	Activity Moderate n = 39	Groups High n = 57	F
BMI	32.53 <sub>a</sub> (7.25)	27.11 <sub>ab</sub> (6.26)	25.64 <sub>b</sub> (4.35)	3.59*
Self-Efficacy	24.00 <sub>a</sub> (7.26)	41.23 <sub>b</sub> (7.92)	47.86 <sub>c</sub> (8.25)	20.89**
Social Support From Friends	20.25 <sub>ab</sub> (12.31)	21.87 <sub>a</sub> (9.75)	27.74 <sub>b</sub> (10.32)	4.34*
Self Regulation (goals)	17.00 <sub>a</sub> (3.56)	28.92 <sub>b</sub> (7.44)	34.56 <sub>c</sub> (9.31)	11.30**
Self Regulation (plans)	21.00 <sub>a</sub> (5.35)	25.33 <sub>a</sub> (5.72)	31.74 <sub>b</sub> (6.97)	14.41**
Expectations Total	79.50 <sub>a</sub> (28.35)	154.05 <sub>b</sub> (44.66)	179.98 <sub>c</sub> (49.87)	10.36**
Expectations Psychology	27.75 <sub>a</sub> (10.78)	69.21 <sub>b</sub> (24.47)	84.17 <sub>c</sub> (25.23)	12.27**
Expectations Body Image	28.00 <sub>a</sub> (13.14)	49.63 <sub>b</sub> (14.81)	57.10 <sub>c</sub> (13.71)	9.75**

Note: \*  $p < .05$       \*\*  $p < .001$

Means not sharing a common subscript differ with  $p < .05$  using the Tukey Procedure

## Discussion

The American Heart Association (AHA) and the American College of Sports Medicine (ACSM) suggest at least 30 min of moderate physical activity (PA) at least 5 days a week or 20 min of vigorous PA at least 3 days a week (Haskell et al., 2007). The purpose of this study was to assess the general level of PA in Hispanic college population attending a large southwest university in the US. In addition, this study examined the relationships between PA and SCT constructs, derived from Bandura's SCT, using measures from previous research. We expected SCT constructs to positively correlate with PA. It was also hypothesized that the intercorrelations among the SCT constructs would be positive.

The results of this study showed rates of PA to be slightly higher than previously published results on college students ranging from 37-44% of students reporting being sufficiently active (Petosa et al., 2003; Patrick, Covin, & Fulop, 1997; Douglas, Douglas, & Collins, 1997; Haberman, & Luffey, 1998). These results might not be surprising knowing that

majority of students in this study were kinesiology major. Thus, a slightly higher reported participation in PA was expected. Furthermore, the results showed that students reached over 6000 METS of PA per week. However, the large standard deviation suggests that a proportion of students scored considerably higher or lower than the mean.

The sample had an average BMI of 26.5 (kg/m<sup>2</sup>), which is slightly higher than BMIs reported in other studies on college students (Rovniak et al., 2002; Wallace et al., 2000; Wyse, Mercer, Ashford, Buxton, & Gleeson, 1995). In contrast to statements made above, it is surprising that kinesiology major students (majority in this study) rated this high on BMI. On the other hand, the ratio of weight and height is usually not considered the best estimate of BMI. Regardless of these, in a way unexpected, results of BMI, the need for PA is important since the previous results in this population also showed the rates of overweight and obesity to be high (41% being overweight, including 13% classified as obese; Magoc & Tomaka, 2006). Furthermore, 33% of El Paso adults are obese, and 16% of the Hispanics in the El Paso region have been diagnosed with type 2 diabetes, which is more than 3 times the national average (Heath & Coleman, 2003). In addition, the obesity rate among Hispanics is 22.6%, which is higher than among non-Hispanic white (18.7%). However, the obesity among Hispanics is even worse in Texas where one third of Hispanics are considered obese (Heath & Coleman, 2003).

The primary analysis in this study tested the relationships between the SCT constructs and PA. As expected, the SCT constructs showed a positive correlation with the level of PA. In addition, self-efficacy remained the most significant predictor of PA for both genders. These results are consistent with previous studies reporting that self-efficacy was the strongest predictor of regular PA (McAuley, 1992; Armstrong, Sallis, Hovell, & Hofstetter, 1993; Wallace et al., 2000; Sallis, Hovell, & Hofstetter, 1992; Rovniak et al., 2002).

#### *Limitations and Recommendations for Future Research*

The present study has several limitations, and such limitations point toward the need for future research. For example, one limitation of the present study was its cross-sectional design. Even though useful, this type of design does not provide conclusions about causality. A real problem in causal order exists in cross-sectional studies because the relationship between the dependent and independent variables may just be reciprocal. In this study, specifically, the higher level of self-efficacy may show increase the level of PA. On the other hand, the higher level of PA may show increase in self-efficacy. Here comes the real problem because it is uncertain whether self-efficacy precedes the PA or vice versa. This is especially typical in correlational studies, and it refers to Ambiguous Temporal Precedence, one of the threats to internal validity (Shadish, Cook, & Campbell, 2002). Longitudinal studies, however, would have a greater ability to drawing conclusions regarding individual's participation in PA and how such activity relates to SCT variables.

A second limitation related to generalization, one of the threats to external validity (Shadish et al., 2002). The results in this study were based on a sample of college students who are primarily of Mexican origin. However, this sample is still small to draw conclusions about the Hispanic college population in general and other Hispanic groups, in particular. In addition, the majority of students in this study were kinesiology major, and it is uncertain that the same results would hold for other majors.

A final limitation related to the self-report nature of the measures and accompanying problems. Self-reports do not provide an objective measure of levels of PA. Without the use of accurate and more objective ways to measure PA, there is always the risk of bias in the results. In this regard, future studies might rely on a wider variety of data sources and more objective measures (e.g., using pedometers, heart rate monitors), rather than relying exclusively on self-reported questionnaires.

The results of this study suggest that people with higher self-efficacy are more likely to participate in PA. The results also help understand the relationship between the SCT variables and PA, suggesting that maintaining the SCT processes will lead to regular PA. Thus, encouraging and targeting PA together with cognitive changes might be of great interest for future research.

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