ORIGINAL RESEARCH

Recreational Sports Journal, 2006, **30**, 87-99
© 2006 NIRSA Foundation

Student Attitudes Toward Sports and Fitness Activities After Graduation

Scott Forrester, Christopher Arterberry, and Bob Barcelona

Colleges and universities have generally been seen as environments where physical activity can be facilitated and promoted. Most colleges and universities offer programs and facilities that promote participation in recreational sports, physical activity, and overall physical health. This study was designed to examine the relationship between recreational sports involvement, satisfaction, interpersonal and group, physical health and well-being, and academic benefits of involvement and the importance of sports and fitness activities after graduation. Surveys were randomly distributed to students ($N = 718$) participating in a variety of recreational sports programs. Multiple regression was used to analyze the relationship between the predictor variables (involvement, satisfaction, and benefits of involvement) and the outcome variable (importance of sports and fitness activities after graduation). Only physical health and well-being benefits and the combined measure of recreational sports involvement were significant predictor variables in the regression equation. Understanding the impact of campus programs devoted to influencing positive health behavior, including physical activity, is a critical component in understanding the benefits of recreational sports involvement. Suggestions for future research are made in the context of the limitations of the study.

Key Words: benefits, campus recreation, involvement theory, regression, recreational

The known benefits of lifetime physical activity have been well documented in the professional literature (Blair, 1993; Blair, Kohl, Gordon, & Paffenbarger, 1992; Bouchard, Sheppard, & Stevens, 1994; Pate, Heath, Dowda, & Trost, 1996; Wankel & Berger, 1990). Regular participation in physical activity has been shown to positively impact a number of health benefits, including a reduced risk of premature mortality, coronary heart disease, hypertension, colon cancer, Type 2 diabetes, osteoarthritis, and osteoporosis (US Dept of Health and Human Services, 1996). Participation in physical activity also appears to have a positive impact on affective development by reducing levels of depression and anxiety, improving mood, and enhancing abilities to perform daily tasks (US Dept of Health and Human Services). Despite the apparent benefits of such participation, previous research has shown

Forrester is with the Dept of Recreation and Leisure Studies, Brock University, St. Catharines, ON, Canada, L2S 3A1. Arterberry is with the Dept of Campus Recreation, DePaul University, Chicago, IL 60614. Barcelona is with the Dept of Recreation Management and Policy, University of New Hampshire, Durham, NH 03824.

that approximately 33% of adolescents and 40% of adults are not regularly physically active (Centers for Disease Control, 2005).

Growing obesity rates and a corresponding increase in the prevalence of diseases have made increased physical activity one of ten leading health indicators for improving the nation's health (US Dept of Health and Human Services, 2000). Participation in recreational sports and fitness activities while in college have been shown to have positive impacts on student health outcomes, including physical fitness, strength, and well-being; stress reduction; and decreased alcohol consumption (Astin, 1993; Bryant, Bradley, & Milborne, 1994; Haines, 2001; Kanters, 2000; Ragheb & McKinney, 1993). Healthy lifestyle behaviors in general, and increased physical activity in particular, have been regarded as positive outcomes of the college experience, and are significant components of the organized co-curriculum in higher education (Sandeen, 1996).

Due to their resources and potential for positively influencing student development, colleges and universities have generally been seen as environments where physical activity can be facilitated and promoted (Archer, Probert, & Gagne, 1987; Suminski, Petosa, Utter, & Zhang, 2002). Most colleges and universities in the US offer programs and facilities that promote participation in recreational sports, physical activity, and overall physical health (NIRSA, 2004; Sivik, Butts, Moore, & Hyde, 1992). Despite the increasing resources devoted to recreation facilities and programs on college campuses, 42.2% of undergraduates reported that they were not regularly physically active (Douglas & Collins, 1997). In addition, women, off-campus residents, and non-traditional aged undergraduate and graduate students were significantly less likely to participate in campus recreational sports and fitness programs than their traditional-aged peers (Barcelona & Ross, 2002).

Understanding the impact of campus programs devoted to influencing positive health behavior, including physical activity, is a critical component for comprehending gains in this dimension of college student development. Campus recreational sports departments seem to be uniquely positioned to have an influence on improving students' health attitudes and behavior. In all areas of student life, assessing the impact of student involvement is crucial in the design of quality programs that improve college students' health knowledge, attitudes, and behaviors.

The college student development literature presents evidence that suggests the "amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program" (Astin, 1984, p. 298). This theory of student involvement is central to understanding the impact that out-of-class experiences, such as involvement in campus recreational sports activities, have on the student experience. Kuh (1995) addresses this phenomenon using the "college impact approach" that accounts for learning and personal development through the documentation of those outcomes that are produced through interactions between students and their institution's environments. Pascarella's (1985) student development model also suggests that development is a function of the quality of effort students invest in educationally purposeful activities while attending college.

If improving overall health and increasing physical activity are specific outcomes of the college experience, then influencing student attitudes toward such behaviors after they graduate should be an important area for student affairs administrators to consider. Favorable attitudes toward leisure behaviors, such as the

importance placed on participation in sports or physical activity, have been shown to predict engagement in these activities (Ajzen & Driver, 1992). The theory of planned behavior posits that people tend to engage in recreational activities when they associate favorable outcomes with the activity (Ajzen & Driver, 1991). In addition, a key tenet of social exchange theory related to this study states that individuals will maintain interactions in situations in which rewards exist, e.g., continuing to engage in sports and fitness activities as long as rewards exist (Blau, 1964). If students feel they benefit from participating in recreational sports while in college, they are likely to continue engaging in those activities which, in turn, suggests that sports and fitness activities would be important to them after graduation.

Purpose

The purpose of this study was to examine how measures of co-curricular involvement, satisfaction, and three benefits of involvement contribute to understanding the importance that students place on sports and fitness activities after graduation. Specifically, the variables used to predict the importance students place on sports and fitness activities after graduation are: involvement and satisfaction with campus recreational sports; physical health and wellness benefits; academic benefits; and interpersonal group benefits. Astin's (1984) theory of involvement, social exchange theory (Blau, 1964), and the theory of planned behavior (Ajzen, 1985) provided the theoretical rationale for inclusion of these predictor variables. Figure 1 visually represents the relationship between the variables being examined in this study.

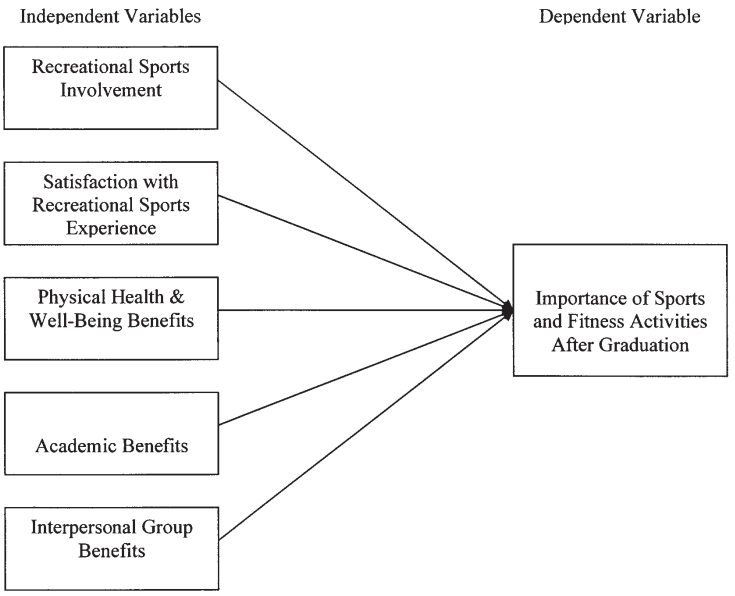

Figure 1 — Predictive model of the relationship between the variables under investigation.

Methodology

To better understand students' attitudes toward the importance of sports and fitness activities after graduation, the Quality and Importance of Recreational Services (QIRS) Survey (NIRSA, 1991; 2000) was administered randomly on-site to students participating in various recreational sports programs during a 3-week period at a comprehensive post-secondary institution. These programs consisted of aquatics, club sports, group exercise classes (aerobics), informal sports (pick-up basketball, jogging/walking on track), intramural sports (both dual-individual and team sports), and also strength and conditioning rooms. Program times for aquatics, strength and conditioning rooms, and informal sports were randomly selected during the 3-week period and employees of recreation services approached students during those selected times to participate in the study. Specific group exercise classes, club sports, and intramural sports were randomly selected during the 3-week period and students involved in those classes, clubs, or intramural sports were invited to participate in the study.

Since this study was guided, in part, by Astin's (1984) theory of involvement, only those students involved or participating in recreational sports programs were sampled and each participant had an equal opportunity of being selected. The QIRS survey, developed by NIRSA in conjunction with the National Center for Assessment (NIRSA, 1991) was initially pilot tested to 591 seniors at a comprehensive doctoral-granting institution and subsequently to five different institutions and over 2,586 students. Responses to the survey instrument were normally distributed and the psychometric properties of the Likert benefit scales were determined to be reliable (NIRSA, 1991; 2000).

The survey used in this study consisted of four main sections: (1) background demographics, (2) measures of involvement, (3) measures of satisfaction with recreational sports, and (4) a scale measuring perceived academic, interpersonal group, and physical health and wellness benefits. Students were asked to indicate whether they participated in various campus recreational sports activities (i.e., intramural and club sports, group exercise, strength training, informal sports, and the like) and also to indicate how satisfied they were with the recreational sports program on their college campus. Students responded to three satisfaction questions (overall experience, friendliness, and approachability of staff) based on a five-point Likert scale ranging from "Very Dissatisfied" to "Very Satisfied." Individual responses to the different involvement and satisfaction questions were added together to get an overall aggregate measure for recreational sports involvement and satisfaction with recreational sports. Therefore, a higher score indicated a higher level of involvement and satisfaction.

The benefits scale was comprised of 20 questions measured on a four-point Likert scale ranging from "Do Not Participate," "Do Not Benefit," "Benefit Somewhat," and "Benefit Much." Academic benefits included questions about communication skills, problem-solving skills, study habits, time management skills, understanding written information, and ability to handle several tasks at once. Interpersonal and group benefits were comprised of questions such as group cooperation skills, respect for others, feeling a sense of belonging, and leadership skills. Physical health and well-being benefits consisted of questions dealing with feeling of physical well-being, sense of accomplishment, sense of adventure, sports

skills, fitness, physical strength, stress reduction, balance-coordination skills, and self-confidence. Higher scores on each benefits scale indicated benefiting more within that area. The criterion variable in this study was measured with a single question asking respondents to indicate how important sports and fitness activities will be to them after graduation and was measured on a four-point Likert scale ranging from "Not Important," "Somewhat Important," "Important," and "Very Important."

Results

A total of 718 usable surveys were collected during a 3-week period. Analysis of respondent demographics indicated there were 406 males (60.8%) and 262 females (39.2%) (50 respondents left gender blank). Twenty-five percent were 18-19 year-olds, 38.9% were 20-21, 20.2% were 22-24, and 15.8% were age 25 or older. Seventeen percent of the students were freshmen, 21.2% sophomores, 20.6% juniors, 22.5% seniors, 12.9% graduate students, and 5.7% were "other." Just over one quarter of the respondents lived in residence halls (26.5%), 56.6% lived off-campus, 15.4% lived in fraternities or sororities, and 1.5% lived in married student housing. The majority of the respondents were Caucasian (84.7%), the categories Asian and African American accounted for an equal percentage of the responses (3.7% each), while 2.4% of the responses came from Hispanic Americans; less than 1% of the respondents were Native American. Descriptive statistics for the outcome and predictor variables are presented in Table 1.

The benefits scale of the QIRS survey was analyzed using exploratory factor analysis. Using principal-axis extraction with an oblique rotated pattern matrix, a three-factor solution was identified. Items that loaded at 0.40 or greater were retained. Oblique rotation was used to account for the possibilities of correlations

Table 1 Descriptive Statistics for Outcome and Predictor Variables

Variables	N	Min.	Max.	*M*	*SD*
Importance of sports and fitness activities after graduation	709	1	4	3.08	0.90
Predictor variables:					
1.Recreational sports involvement	688	0	6	2.32	1.30
2. Satisfaction with recreational sports	706	3	15	12.87	2.41
3. Academic benefits	694	6	24	17.13	4.20
4. Interpersonal and group benefits	700	6	24	17.58	4.45
5. Physical health and well-being benefits	691	8	32	27.42	4.38

between factors. (Tabachnik & Fidell, 1996). The total variance explained by the three-factor solution was 68.59%. In addition, eigenvalues for the interpersonal and group, physical health and well-being, and academic factors were 9.849, 2.850, and 1.018, respectively. Eigenvalues, percent of variance explained for each factor, and cumulative variance explained by the three-factor solution are presented in Table 2; Table 3 indicates factor loadings and item communalities.

Table 2 Principal-Axis Factor Analysis Extraction with Oblique Rotation

Factor	Eigenvalue	Percent of variance	Cummulative variance
1	9.849	49.25	49.25
2	2.850	14.25	63.50
3	1.018	5.09	68.59

Note: Factor 1, Interpersonal and Group Benefits; Factor 2, Physical Health and Well-Being Benefits; Factor 3, Academic Benefits

Table 3 Oblique Rotation Rotated Factor Loadings

Item	Interpersonal and group benefits	Physical health and well-being benefits	Academic benefits
Communication skills	0.860		
Leadership skills	0.852		
Sense of belonging	0.803		
Group cooperation	0.786		
Respect for others	0.752		
Sense of adventure	0.528		
Friendships	0.404		
Fitness		0.918	
Physical strength		0.905	
Physical well-being		0.773	
Stress reduction		0.773	
Accomplishment		0.687	
Balance-coordination		0.584	
Self-confidence		0.515	
Sports skills		0.418	
Study habits			0.667
Understanding written info			0.575
Time management			0.539
Handling multiple tasks			0.526
Problem solving skills	0.410		0.508

Factor 1 (interpersonal and group benefits) accounted for 49.25% of the variance in the solution and included seven variables that reflected the interpersonal and group benefits scale of the QIRS benefits survey. Another variable, problem solving skills, also loaded on factor 1. The variable was proposed to load on the academic benefits factor, which it also did. The factor loading of this variable on the interpersonal and group benefits factor was 0.41 which was relatively low (Comrey & Lee, 1992). Factor 2 (physical health and well-being benefits) accounted for 14.25% of the variance of the model and consisted of the eight items that represented the physical health and well-being benefits scale. The third factor (academic benefits) accounted for 5.09% of the variance in the solution and contained each of the five items that reflected the academic benefits scale of the QIRS benefits survey.

Reliability analysis of the benefits scale, using Cronbach's index of internal consistency, produced an alpha coefficient of 0.9452, indicating a high level of reliability. Cronbach's alpha reliability coefficients were also used to examine the internal consistency of the three factors within the QIRS benefits scale. Cronbach's alpha for the physical health and well-being, academic, and interpersonal group benefits factors were 0.894, 0.900, and 0.892, respectively. Cronbach's alpha was 0.863 for satisfaction with the recreational sports experience and 0.485 for the combined measure of recreational sports involvement.

Multiple regression was used to analyze the relationship between the predictor variables (involvement, satisfaction, and the three benefits of involvement) and the outcome variable (importance of sports and fitness after graduation). Analysis of the univariate statistics for the predictor variables and plots of the distribution of these variables indicated assumptions of normality were met for all variables. Furthermore, plots of the predicted values of the outcome variable against the residuals appear to conform to the assumptions of normality, linearity, and homoscedasticity. Lastly, Pearson's correlation coefficients between the predictor variables were analyzed checking for statistical problems created by multicollinearity, which can occur when the zero-order correlations between any two predictor variables is greater than 0.90 (Tabachnik & Fidell, 1996). The correlation between academic benefits and interpersonal group benefits was $r = 0.785$ ($p < .001$). While this correlation coefficient is less than 0.90, Tabachnik and Fidell warn researchers that including any predictor variables with correlation coefficients greater than $r = 0.70$ may weaken the predictive strength of the resulting regression equation.

The overall regression equation ($y' = 0.158x_1$ (Recreational Sports Involvement) $+ 0.042x_2$ (Satisfaction with Recreational Sports) $+ 0.019x_3$ (Academic Benefits) $- 0.023x_4$ (Interpersonal and Group Benefits) $+ 0.309x_5$ (Physical Health and Well-Being Benefits) $+ 0.898$) was significant at the 0.05 level ($F = 19.783$, $p < .001$). The overall R^2 was 0.151, indicating that the model accounted for, or explained, 15.1% of the variance in the importance of sports and fitness after graduation (Table 4). Only physical health and well-being benefits ($t = 6.346$, $p < .001$) and the combined measure of recreational sports involvement ($t = 4.247$, $p < .001$) resulted in being significant predictor variables in the regression equation. The strongest predictor of subjects' responses to the importance of sports and fitness after graduation was physical health and well-being benefits ($\beta = .309$) and recreational sports involvement ($\beta = .158$). The data was further cross-validated to check the stability of the model from sample to sample. The sample was randomly split in half ($n = 359$ in each sample) and the regression equation from the first sample was applied to the

Table 4 Regression Analysis Summary for Criterion Variables Predicting the Importance of Sports and Fitness Activities After Graduation

Variables	B	SEB	β	T	Sig.
Constant	0.898	0.233		3.85	< .001
1. Recreational Sports Involvement	0.108	0.025	0.158	4.247	< .001
2. Satisfaction with Recreational Sports	1.641E-02	0.016	0.042	1.023	0.307
3. Academic Benefits	4.079E-03	0.013	0.019	0.311	0.756
4. Interpersonal and Group Benefits	–4.680E-03	0.012	–0.023	–0.382	0.702
5. Physical Health and Well-Being Benefits	6.353E-02	0.010	0.309	6.346	< .001

Note: $R = .389$, $R^2 = .151$, adjusted $R^2 = .145$; $F = 22.71$, $p < .001$.

second sample to evaluate the amount of shrinkage of the estimates of the model. The difference between the two *R*-squared values represents the shrinkage of the estimates of the model and fell within the acceptable 0.10 level (Tabachnik & Fidell, 1996) indicating that the model was stable from sample to sample.

Discussion

The purpose of this study was to analyze the relationship between involvement, satisfaction, physical health and well-being, academic, and interpersonal group benefits, and the importance students placed on sports and fitness activities after graduation (SFAAG). The findings indicated that physical health and well-being benefits and recreational sports involvement were significant predictive variables for the importance that students placed on SFAAG. Social exchange theory (SET) is useful when attempting to understand why physical health and well-being benefits were the strongest predictor of the importance that students place on SFAAG. As stated earlier, one of the tenets of social exchange theory states that individuals will maintain interactions in situations in which rewards exist. The findings are consistent with this aspect of SET as physical health and well-being benefits were the strongest predictors of the importance students placed on SFAAG, suggesting that they will continue to participate in sports and fitness activities after graduation (assuming importance is an indication of behavior) as long as they continue to benefit.

While it cannot be concluded that students will indeed continue to participate in sports and fitness activities when they graduate simply because they indicated

these activities will be important to them after graduation, the findings from this study do support the theory of planned behavior (TPB), which is used to understand and predict behavior (Ajzen, 1985). The model is comprised of three dimensions: (1) the subject's attitude toward a given behavior, (2) subjective norm(s), and (3) perceived behavioral control. Attitude, defined within the context of the TPB as the belief that a given behavior has specific outcomes and the value placed on those outcomes (Ajzen & Madden, 1986), is addressed in this study by examining the importance of SFAAG as well as students' expectations of health and wellness benefits associated with SFAAG. This is an important determinant in students' success in implementing and maintaining physical activity, both during and after the college experience, as individuals with a negative view of exercise are less likely to remain active (Sullum, Clark, & King, 2000). Those with a positive attitude toward a given behavior (in this case, importance of SFAAG) are also more likely to engage in recreational activities (Ajzen & Driver, 1991) as favorable outcomes have been shown to predict engagement in such activities (Ajzen & Driver, 1992).

While "the amount of student learning and personal development associated with any educational program is directly proportional to the quality and quantity of student involvement in that program" (Astin, 1984, p. 298) the findings suggest that the more students are involved in recreational sports during their college years the more importance they place on sports and fitness activities after graduation. Why recreational sports involvement was not a stronger predictor could be an indication of using a conceptually weak measure of involvement in this study. The researchers only measured the "breadth" of students' involvement in terms of a range of campus recreational sports activity offerings and did not measure the depth of their involvement. Moreover, this involvement was simply measured as a dichotomous variable (either "Yes" they did participate in that activity or "No" they did not) and the aggregate of their responses were grouped to measure recreational sports involvement. This led to less variability in the overall measure, thereby lowering the reliability, and ultimately diminishing its impact as a predictor variable in this study. Perhaps a better approach would have been to measure involvement on a Likert scale ranging from "Very Involved" to "Not at All Involved" for each of the individual activities in a manner similar to the technique used in the College Student Experiences Questionnaire (Pace, 1990). Furthermore, there was no consideration of the "quality" of their involvement which suggests the use of multi-method approaches in the future when applying Astin's (1984) theory of involvement to recreational sports participation.

Neither perceived academic benefits nor interpersonal group benefits were significant predictors of the importance students placed on SFAAG. These findings would suggest that students feel that these benefits are specific to their participation while a student, and do not have a significant bearing on the importance they place on SFAAG after graduation. While the lifetime physical health and well-being benefits of remaining active and exercising are well documented, it would appear, in this case, students feel academic and interpersonal group benefits do not extend past their college years and have no bearing on the importance they place on SFAAG. This also seems to support SET as individuals maintain interactions in which rewards exist. With respect to these two benefits, students may feel these rewards (benefits) may not exist after graduation and therefore are not significant influences in terms of whether sports and fitness activities will be important to them

after graduation (Blau, 1964). In addition to the theoretical justification for using SET for this finding, several statistical explanations likely also exist. These two benefits were rated lower by students in this study when compared to physical health and well-being benefits and the correlation between academic and interpersonal group benefits was $r = 0.785$ ($p < .001$). This ultimately weakened their predictive strength in the resulting regression equation (Tabachnik & Fidell, 1996).

This investigation determined that satisfaction with recreational sports participation was not a predictor of the importance students placed on SFAAG, which is consistent with long-term exercise behavior. The health and wellness benefits of physical activity remain constant regardless of age or location, whereas delivery of recreational services does not. That is, a regular exerciser, while certainly interested in a satisfying experience with facilities, programs, or services, is more interested in the physical benefits derived from activity, since, for example, one may change health clubs at some point in time, or find oneself in a financial situation that does not allow for a club membership. The result for "satisfaction" in determining post-graduation importance seems to indicate a higher interest by students in the activity and its benefits, and a lesser interest in delivery. Furthermore, satisfaction had no theoretical rationale for being included compared to the other predictor variables. From a theoretical standpoint, this finding is supported. Lastly, students were generally quite satisfied with their overall recreational sports experience ($M = 12.87$, $SD = 2.41$, out of a maximum 15) in this study, resulting in less variability in responses to this predictor variable, thereby weakening its predictive strength in the regression equation.

If recreational sports programs on post-secondary campuses are to create long-term, positive impacts on students after they graduate, they should encourage students to develop an exercise schema. Schema theory is an information processing tool; a cognitive structure for guiding action (Fiske & Taylor, 1984; Markus, 1977). The theory, as it relates to physical activity, states that people act as exercisers to the extent that they perceive themselves as such. Doing so provides congruency between self-perception and action, and increases self-efficacy, which is another important moderator of exercise adherence (Bandura, 1977; Sallis et al., 1989; Swann, 1983). In addition, the TPB theorizes that when one identifies as an exerciser the perceived level of control is enhanced as well, further increasing the likelihood of turning exercise intention into behavior (McAuley & Jacobson, 1991; Yin & Boyd, 2000).

Establishing identity is one of the core developmental issues that students address in college according to student development theory (Chickering & Reisser, 1993). This establishment of identity includes, among other facets, comfort with body and appearance, and roles and lifestyle. Recreational sports participation during college provides a prime opportunity for students to develop an identity as exercisers. It is also beneficial to help students recognize when their self-perception matches a particular schema, so the link between behavior and action can be made. For example, a student whose primary means of transportation on a residential campus is walking may not recognize such activity as exercise and, therefore, not self-identify as an exerciser. However, when educated on the benefits of adopting active healthy lifestyles, the student may come to realize that she or he has been participating in regular, even if light to moderate, physical activity. Based on this realization of a successful pattern of behavior, the student then may determine that further advances in her or his fitness level are quite realistic.

Conclusion

As with any research, this study is not without its limitations. The main limitations include the single institutional sample, the majority of respondents were Caucasian, the correlation between academic and interpersonal group benefits, and what turned out to be a conceptually (and statistically) weak measure of involvement. Combined, these limitations ultimately weakened the predictive strength of the regression equation. While not serious, future research studies should correct for these limitations to increase the understanding of the impact of recreational sports involvement during college on participation and attitude towards active healthy lifestyles after graduation.

The greater the students' recreational sports involvement the more they stand to benefit (involvement theory). As long as students benefit, they will continue to be involved or participate (SET) and have favorable attitudes towards their involvement (TPB). And as long as they have favorable attitudes, they will have positive intentions which further lead to continued involvement (TPB). Future research could use structural equation modeling or path analysis to examine these relationships, and should also measure the breadth, depth, and quality of students' involvement and incorporate subjective norms (perceived social pressure to perform or not to perform the behavior) and perceived behavior control (perceived ease or difficulty of performing the behavior) as other tenets of TPB.

A college education enhances a student's chance of life success in methods beyond the classroom. Participation opportunities in sport and fitness are essential components of this out-of-class experience, and contribute to student development, and improve overall health, fitness, and well-being. By establishing regular exercise patterns while in college and developing favorable attitudes towards active healthy lifestyles, students' lifelong personal health may be positively impacted (NIH Consensus Conference, 1996). To maximize student impact, a desired outcome for these participation opportunities should be to positively influence students' behaviors after graduation, and not only during attendance. While the results of this study are encouraging, the research is based on current college students. Future research should examine alumni to determine the impact their recreational sports involvement while a student had on their current physical activity levels as an adult. If recreational sports programs, college health professionals, and student personnel administrators want to truly demonstrate the impact they are having, research efforts need to extend beyond the college years and examine lifetime changes in attitudes and behaviors in developing, adopting, and integrating healthy active lifestyles after graduation.

References

Ajzen, I. (1985). From intentions to action: a theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp. 11-30). Springer, Heidelberg, Germany.

Ajzen, I., & Driver, B.L. (1991). Prediction of leisure participation from behavioral, normative, and control beliefs: An application of the theory of planned behavior. *Leisure Sciences, 13*, 185-204.

Ajzen, I., & Driver, B.L. (1992). Application of the theory of planned behavior to leisure choice. *Journal of Leisure Research, 24*, 207-224.

Ajzen, I., & Madden, T.J. (1986). Prediction of goal-directed behavior: attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology, 22*, 453-474.

Archer, J., Probert, B.S., & Gage, L. (1987). College students' attitudes toward wellness. *Journal of College Student Personnel, 28*, 311-317.

Astin, A.W. (1984). Student involvement: A development theory for higher education. *Journal of College Student Personnel, 25*, 297-308.

Astin, A.W. (1993). *What matters in college? Four critical years revisited*. San Francisco: Jossey-Bass.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Barcelona, R.J., & Ross, C.M. (2002). Participation patterns in campus recreational sports: An examination of quality of student effort from 1983 to 1998. *Recreational Sports Journal, 26*, 41-53.

Blair, S.N. (1993). 1993 C.H. McCloy Research Lecture: Physical activity, physical fitness and health. *Research Quarterly for Exercise and Sport, 64*, 365-376.

Blair, S., Kohl, H., Gordon, N., & Paffenbarger, R. (1992). How much physical activity is good for health? *Annual Review of Public Health, 13*, 99-126.

Blau, P.M. (1964). *Exchange and power in social life*. New York: Wiley.

Bouchard, C., Shephard, R., & Stevens, T. (Eds.) (1994). *Physical activity, fitness and health: International proceedings and consensus statement*. Champaign, IL: Human Kinetics.

Bryant, J., Bradley, J., & Milborne, C. (1994). Comparing student participation in campus recreation to other aspects of campus life. *NIRSA Annual Conference Review*, *45*, 144-168.

Centers for Disease Control and Prevention. (2005). Health, United States, 2005 with chartbook on trends in the health of Americans. Retrieved February 1, 2006, from http://www.cdc.gov/nchs/data/hus/hus05.pdf.

Chickering, A., & Reissser, L. (1993). *Education and identity,* (2d Ed.). San Francisco: Jossey-Bass.

Comrey, A.L. & Lee, H.B. (1992). *A first course in factor analysis.* (2d Ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Douglas, K.A., & Collins, J.L. (1997). Results from the 1995 National College Health Risk Behavior Survey. *Journal of American College Health, 46*, 55-66.

Fiske, S.T., & Taylor, S.E. (1984). *Social cognition.* Reading, MA: Addison-Wesley.

Haines, D.J. (2001). Undergraduate student benefits from university recreation. *NIRSA Journal, 25*, 25-33.

Kanters, M.A. (2000). Recreational sport participation as a moderator of college stress. *Recreational Sports Journal, 24*, 11-24.

Kuh, G. (1995). The other curriculum: Out of class experiences associated with student learning and personal development. *Journal of Higher Education, 66*, 123-155.

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology, 35*, 63-78.

McAuley, E., & Jacobson, L. (1991). Self-efficacy and exercise participation in sedentary adult females. *American Journal of Health Promotion, 5*, 185-207.

National Institutes for Health Consensus Conference (1996). Physical activity and cardiovascular health. *JAMA, 276,* 241-246.

National Intramural Recreational Sports Association (1991). *Quality and importance of recreational services: Technical manual and survey*. Corvallis: OR: NIRSA National Center.

National Intramural Recreational Sports Association (2000). *Quality and importance of recreational services: Technical manual and survey*. Corvallis: OR: NIRSA National Center.

National Intramural Recreational Sports Association (2004). *The value of recreational sports in higher education: Impact on student enrollment, success, and buying power*. Champaign, IL: Human Kinetics.

Pace, C.R. (1990). *College student experiences questionnaire, third edition*. Los Angeles: University of California, the Center for the Study of Evaluation, Graduate School of Education.

Pascarella, E.T. (1985). Student's affective development within the college environment. *Journal of Higher Education, 56*, 640-663.

Pate, R.R., Heath, G.W., Dowda, M., & Trost, S.G. (1996). Associations between physical activity and other health behaviors in a representative sample of U.S. adolescents. *American Journal of Public Health, 86*, 1577-1581.

Ragheb, M., & McKinney, J. (1993). Campus recreation and perceived academic stress. *Journal of College Student Development, 34*, 5-10.

Sallis, J.F., Hovell, M.F., Hofstetter, C.R., Faucher, P., Elder, J.P., Blanchard, J., Caseperson, C.J., et al. (1989). A multivariate study of determinants of vigorous exercise in a community sample. *Preventive Medicine, 18*, 20-34.

Sandeen, A. (1996). Organization, functions, and standards, of practice. In S.R. Komives, D.B. Woodard & Associates (Eds.). *Student services: A handbook for the profession* (3rd Ed.), pp. 435-457. San Francisco: Jossey-Bass.

Sivik, S.J., Butts, E.A., Moore, K.K., & Hyde, S.A. (1992). College and university wellness programs: An assessment of current trends. *NASPA Journal, 29*, 136-142.

Sullum, J., Clark, M.M., & King, T.K. (2000). Predictors of exercise relapse in a college population. *Journal of American College Health*, *48*, 175-180.

Suminski, R.R., Petosa, R., Utter, A.C., & Zhang, J.J. (2002). Physical activity among ethnically diverse college students. *Journal of American College Health, 51*, 75-80.

Swann, W.B., Jr. (1983). Self-verification: Bringing social reality into harmony with the self. In J. Suls & A.G. Greenwald (Eds.), *Social psychological perspectives on the self: Vol. 2,* (pp. 33-66). Hillsdale, NJ: Lawrence Erlbaum Associates.

Tabachnik, B.G., & Fiddell, L.S. (1996). *Using multivariate statistics*. (3rd Ed.). New York: HarperCollins.

US Dept of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, GA: US Dept of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease and Prevention and Health Promotions.

US Dept of Health and Human Services. (2000). Healthy people 2010. Retrieved September 1, 2005, from http://www.health.gov/healthypeople/Document/html/uih/uih_bw/uih_4.htm.

Wankel, L.M., & Berger, B.G. (1990). The psychological and social benefits of sport and physical activity. *Journal of Leisure Research*, *22*, 167-182.

Yin, Z., & Boyd, M.P. (2000). Behavioral and cognitive correlates of exercise and self-schemata. *Journal of Psychology, 134*, 269-282.