

## The Relationship between Athletic Identity and Physical Activity among Former College Athletes

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### **Abstract:**

The purpose of this study was to examine the relationship between athletic identity and physical activity among former college athletes. The relationship was first examined with former Division I athletes ( $N=56$ ) and then in a second sample of former Division III athletes ( $N=18$ ) and non-athletes ( $N=31$ ) from a small college. All participants ( $N=105$ ) completed the Athletic Identity Measurement Scale (AIMS), the Godin Leisure Time Exercise Questionnaire, and the Stage of Exercise Behavior Change measure. The AIMS was a positive predictor of physical activity, and this relationship was stronger for alumni who had participated in college athletics. While former college athletes had higher AIMS scores, they were not more active than alumni who did not participate in college athletics. Former athletes were also more likely than non-athletes to report a decrease in physical activity after college. Substantial decreases in physical activity after the conclusion of a collegiate athletic career have important health implications for former college athletes, which warrant the development of transitional programs that promote lifelong physical activity participation among NCAA student-athletes.

**Keywords:** Sports sciences | Athletics | College athletes | Physical Activity | Athletic Identity

### **Article:**

## **INTRODUCTION**

There are currently more than 400,000 student-athletes competing in intercollegiate sports sponsored by the National Collegiate Athletic Association (NCAA, 2010), and the number of former student-athletes is exponentially more than that. Although the NCAA recognizes that retirement from sports after college is inevitable for most of its members, there are few programs designed to prepare student-athletes for the transition out of collegiate sports. Much of the existing research and programming related to the transition revolve around the construct of athletic identity and its relationship to career planning and the retirement process (Grove, Lavalley, and Gordon, 1997; Lally, 2007; Lally and Kerr, 2005; Lavalley, Gordon, and Grove, 1997; Taylor and Ogilvie, 1994). Research and programs like the NCAA-sponsored Student-

Athlete Affairs Program have not typically emphasized physical activity and health behaviors for student-athletes after they retire from their collegiate careers.

The position statement on recommended physical activity for healthy adults released by the American College of Sports Medicine (ACSM) contends that physical activity is extremely important and provides many health-related and psychological benefits (Haskell, et al., 2007). For instance, regular physical activity participation can reduce the risk for cardiovascular disease, osteoporosis, type 2 diabetes, anxiety, and depression (ACSM, 2010). A major concern for public health officials is that many Americans are not meeting physical activity guidelines and are insufficiently active (*Healthy People 2020*). Given that athletes are often characterized as being physically active, the athlete population is usually not a focus of exercise adherence or physical activity promotion studies or interventions. This gap in research and programming is significant because studies show that, contrary to popular understandings, athletic participation may not necessarily predict post-competitive physical activity across the lifespan (Dishman, Sallis, and Orienstein, 1985; Koukouris, 1991; Stephan and Bilard, 2003). Further, the athlete population may have unique health concerns, which would make maintaining lifelong physical activity levels after retirement from competitive sports of particular importance for this subgroup. For instance, research suggests that former elite athletes may be more susceptible to inactivity-related increases in risks for certain types of chronic diseases such as diabetes and cardiovascular disease (Witkowski and Spangenburg, 2008). Witkowski and Spangenburg (2008) contend that cessation of regular exercise among athletes who retire from their athletic careers can lead to issues with insulin sensitivity, plasma lipids, and body composition. Thus, it is particularly important for athletes to continue to be active even after retirement from competitive sports. The authors warn that athletes who stop physical activity upon retiring from sports will have the same or greater risk for chronic diseases compared to non-athletes who have been sedentary all of their lives. Given these health concerns, the inclusion of the retired athlete population in studies that track and promote physical activity is imperative.

In order to gain a better understanding of physical activity among retired athletes, it is important to acknowledge that athletic retirement is “a coping process with potentially positive or negative outcomes” (Stambulova, Alfermann, Statler, and Cote, 2009, p. 396). According to Taylor and Ogilvie (1994), retirement from an athletic career is a transitional process. Maintaining physical activity after retirement is a possible adjustment difficulty an athlete might experience through the transition (Stephan and Bilard, 2003). Self-identity is perhaps the most important factor that can impact transition into retirement (Taylor and Ogilvie, 1994). Because athletic identity is a major source of self-identity for athletes, it is appropriate to focus on the role of athletic identity in the transition process, and specifically in maintaining physical activity.

According to identity theory, identity can be defined as “meanings one attributes to oneself in a role” (Burke and Reitzes, 1981), and it is formed and maintained through social processes. Through interaction with others who confirm and validate one’s self-concept, individuals are able to establish identities. Beyond serving as a means for defining oneself, identity also impacts the performance of behaviors consistent with a given identity. According to identity theory (Burke and Reitzes, 1981), an individual monitors his or her behavior based on whether or not the meaning of that behavior is in line with the meaning of his or her respective identity role.

Greater identification with an identity role is predictive of greater frequency of engagement in behaviors consistent with that role (Callero, 1985).

Athletic identity is a specific type of identity defined as the extent to which one identifies with the athletic role (Brewer, Van Raalte, and Linder, 1993). In applying identity theory, in order to *identify* as an athlete one must *behave* as an athlete. Because physical activity is a behavior that is consistent with the role of athlete, having a strong athletic identity logically is related to physical activity behavior. Indeed, having a more salient athletic identity has been shown to be related to greater engagement in physical activity (Anderson, 2004; Brewer, Van Raalte, and Linder, 1993). It is important to note that physical activity is not the only behavior associated with athletic identity. Furthermore, the type of physical activity associated with athletic identity may be specific to the athletic setting. Athletic identity is complex and not the same as exerciser identity. Those who identify as exercisers are more likely to participate in greater physical activity (Anderson and Cychosz, 1995), but that exercise activity may or may not be related to athletics or athletic identity. Athletic identity is rooted more specifically in competitive sport. As such, athletic identity may be related to participation in certain modes or intensities of physical activity that are consistent with competitive sport training.

With their Athletic Identity Measurement Scale (AIMS), Brewer, Van Raalte, and Linder (1993) introduced athletic identity as an identity rooted in participation in competitive sports. The AIMS has been the most widely used measurement of athletic identity. Research has shown that greater involvement in athletics is indeed associated with a stronger athletic identity, and men tend to score higher on the AIMS than women (Brewer, Van Raalte, and Linder, 1993). This may reflect the extensive body of research which suggests that athletics is stereotypically viewed as a more masculine space (Gill, 2007; Gill and Kamphoff, 2010; Messner, 1992). Brewer and colleagues (1993) found a positive relationship between the AIMS and amount of physical activity among college students. Research has not examined this relationship among former college athletes specifically, although a similar relationship would seem plausible. Public health reports and large sample research with the general population indicate that women are less active than men across all age groups and other categories (Caspersen, Pereira, and Curran, 2000; CDC, 2011). Whether these gender patterns are similar among former college athletes as well has yet to be determined. Athletic identity has also been linked to problematic issues in retirement, such as emotional difficulties and poor career transition (Lally, 2007; Lally and Kerr, 2005; Lavalley, Gordon, and Grove, 1997), particularly when an athlete's identity is rooted in a performance narrative in which his/her single-minded dedication to sport comes at the expense of developing other identities (Douglas and Carless, 2009). Because of these issues, some have suggested (Lally, 2007; Lally and Kerr, 2005; Lavalley, Gordon, and Grove, 1997) that athletes will transition better if they take proactive steps to disengage from their athletic identity and focus on fostering other identities during retirement in order to avoid maladjustment. Indeed, research shows that the saliency of athletic identity does drop off after retirement from sport (Houle, Brewer, and Kluck, 2010). If athletic identity is facilitative of engagement in physical activity (Brewer et al., 1993), this decrease in saliency of athletic identity could be one important factor related to a decline in physical activity after the conclusion of collegiate sport participation.

While research has not documented the physical activity patterns of former college athletes specifically, Calfas, Sallis, Lovato, and Campbell (1994) found that one third of recent college

graduates they surveyed were presently inactive, and almost half of the alumni reported being less active now compared to when they were in college. Sparling and Snow (2002) reported similar findings when they surveyed college alumni who had graduated within the past ten years and found that 44% of the participants reported being less active now than they were in college. Persistence of physical activity behaviors after college was related to how physically active individuals were while in college: 84.7% of those who reported being regular exercisers in college were as active or more active now while 81.3% of those who did not participate in exercise during college reported being about the same or even less active now.

These findings indicate that some people, especially those who had developed regular physical activity patterns in college, continued to maintain some level of physical activity after graduation, while many other individuals had a clear drop in the amount of time spent engaged in physical activity. Based on these findings, it is plausible that alumni who were athletes during college might continue to be physically active; however, it is difficult to make such comparisons because current research on this topic has not specifically looked at former college athletes.

The general college population is not as active as collegiate athletes and the type and structure of that exercise is different as well. There is a need for studies geared specifically toward athletes to determine their physical activity patterns after retirement from collegiate sports. Additionally, an even greater drop in physical activity after college may occur for former student-athletes who would have difficulty maintaining the high amount of physical activity they engaged in during their college sports career (Galloway, 2007; Zielinski, Krol-Zielinska, and Kusy, 2006). Such a decline in physical activity has been shown to have negative health implications for former athletes (Witkowski and Spangenburg, 2008).

### **Purpose and Hypothesis**

The purpose of this study was to examine the relationship between athletic identity and physical activity among former college athletes. The main research question was, How is athletic identity related to physical activity levels of former college athletes? A positive relationship was hypothesized in that college alumni who scored higher in athletic identity, as measured by the AIMS, would report higher levels of physical activity compared to alumni with lower athletic identity scores.

In addition to former Division I athletes, both athlete and non-athlete alumni from a small Division III college were included for comparison. It was expected that alumni who were former college athletes would report higher athletic identity scores than non-athletes. Although it was expected that the former athletes would report experiencing a greater drop in physical activity after college, it was expected that they would still be more physically active than non-athlete alumni.

Given that research has suggested men tend to score higher on athletic identity than women (Brewer, Van Raalte, and Linder, 1993), it was expected that male participants would have higher athletic identity scores. Finally, because population-wide surveillance data suggest that American men are more active than American women (CDC, 2011), it was expected that men in this study would report being more physically active than women.

## **METHOD**

Survey methods were used with college alumni in two phases to address the research question. Participants completed the Athletic Identity Measurement Scale, the Godin Leisure Time Exercise Questionnaire, a stage of exercise measure, and one item comparing current physical activity with the previous physical activity during college.

### **Participants**

Participants were college alumni who graduated within the past five years (2005-2010). In the first phase, former Division I student-athletes ( $N=56$ ) were surveyed from one southeastern university with permission and cooperation of the university athletic department. In the second phase, former Division III student-athletes ( $N=18$ ) and non-athlete alumni ( $N=31$ ) from a smaller southeastern college were surveyed with the permission and cooperation of the college's alumni office. Data from 105 male ( $n=37$ ) and female ( $n=68$ ) alumni were included in this study. Recruitment was limited to recent graduates to focus on the more immediate transition from college to life after college. The total sample was comprised of Caucasian ( $n=82$ ), African American ( $n=15$ ), Asian/Pacific Islander ( $n=5$ ), and Other ( $n=2$ ) individuals with an average age of 28.3 ( $SD=8.01$ ) years old. Of the 105 graduates, 2% had earned an associates' degree, 78% of the participants had obtained a bachelor's degree, and 20% had earned a master's degree. Former athletes in soccer, basketball, baseball, football, volleyball, lacrosse, golf, tennis, wrestling, cross country/track, swimming, softball, cheerleading, and dance were represented in the sample.

### **Measures**

Athletic identity and physical activity levels were the main variables measured in this study. Athletic identity was measured using the AIMS (Brewer, Van Raalte, and Linder, 1993). Physical activity levels were measured using the Godin Leisure-Time Exercise Questionnaire (Godin and Shepard, 1985) and the Stage of Exercise Behavior Change measure (Marcus et al., 1992).

*AIMS.* The AIMS consists of 10 items rated on a 7-point Likert scale (1= strongly disagree, 7= strongly agree), and a higher total score is interpreted as a more salient athletic identity. The AIMS has been previously (Brewer, Van Raalte, and Linder, 1993; Martin, Mushett, and Eklund, 1994) shown to be a valid, reliable, and consistent measure of athletic identity:  $\alpha= .93$  for internal consistency and  $r=.89$  for test-retest reliability. Validity has been demonstrated by correlating the AIMS to Fox's (1990) Perceived Importance Profile,  $r=.83$  (Brewer, Van Raalte, and Linder, 1993). Reliability of the measure was confirmed in the current study,  $\alpha= .895$ , with all positive item-total correlations, indicating that all items contribute to the total reliability.

*Godin.* The Godin Leisure-Time Exercise Questionnaire (Godin and Shepard, 1985) measures physical activity levels based on self-reported weekly frequencies of strenuous, moderate, and light activities. The Godin asks respondents to report the number of times they engage in strenuous, moderate, and light physical activity in at least fifteen minute bouts during the week.

The Godin provides an approximate MET value for weekly physical activity using the equation: (frequency of strenuous activity/wk X 9) + (frequency of moderate activity/wk X 5) + (frequency of light activity/wk X 3). A higher score indicates greater MET expenditure and thus higher physical activity levels. Validity for this measure was assessed by positive correlations with VO<sub>2</sub> max performance, and the Godin was found to have a test-retest reliability of  $r=.74$  (Godin and Shepherd, 1985). Jacobs et al.'s (1993) review of physical activity measures supports the use of this questionnaire.

*Stage of Exercise.* In addition to the Godin, a stage of exercise behavior change measure developed by Marcus and colleagues (1992) was used to assess former athletes' current physical activity.

The measure, which is based on intention to exercise and exercise behavior, is widely used in research and programs (e.g., Marcus and Forsyth, 2009) to assess stage of exercise (precontemplation, contemplation, preparation, action, and maintenance) and provides an added, broader measure of physical activity levels. Stages range from being sedentary with no intention to begin regular exercise (precontemplation) to being regularly active for more than 6 months (maintenance). With this stage measure, a higher stage number (Stage 5 = maintenance) represents more regular engagement in physical activity.

*One-Item Physical Activity Comparison.* Participants were also asked to indicate whether they were less active now than they were in college, more active now, or about the same.

*Demographics.* The participants were asked to provide background information including gender, age, race, occupation, sport(s) played in college, current sport participation, and amount of time that has passed since their last collegiate competition. These demographics were used to provide relevant information about the sample participating in this study.

## **Procedures**

Prior to the main study, the electronic survey was pilot-tested with former Division I field hockey players ( $N=13$ ) from a different institution.

No issues were raised with the measures or methods and the same measures and electronic survey format were used in the main study. Following approval from the university Institutional Review Board and from the university athletic department, an email containing a hyperlink for the informed consent and survey was sent out through the larger university's athletic department's alumni/booster club.

The same procedures were followed in the second phase with messages sent through the smaller college's alumni office. Using the provided link, the AIMS, the Godin, demographics, and the added questions were administered electronically through the *Qualtrics* online survey software.

Voluntary consent and directions were provided, and participants submitted their answers electronically on the website. Of 127 surveys that were returned, 22 were excluded from data analysis due to not fully completing the questionnaires for a final total of 105 participants.

## RESULTS

Descriptive statistics were calculated for the athletic identity and physical activity measures as well as for demographic information. Tables 1 and 2 provide descriptive information for the AIMS and Godin measures.

**Table 1. Descriptive Statistics for AIMS and Godin – Division I Athletes**

	Division I			
	Male ( $n=22$ )		Female ( $n=34$ )	
	M	SD	M	SD
AIMS Total	44.23	10.70	42.94	9.60
Godin Total	48.86	25.38	44.79	25.71

**Table 2. Descriptive Statistics for AIMS and Godin – Division III Athletes and Non-Athletes**

	Division III Non-Athletes							
	Male ( $n=7$ )		Female ( $n=11$ )		Male ( $n=8$ )		Female ( $n=23$ )	
	M	SD	M	SD	M	SD	M	SD
AIMS Total	46.57	10.10	40.55	12.36	37.13	12.70	24.91	11.88
Godin Total	75.14	33.54	38.50	20.43	53.50	18.94	42.28	24.24

The results are presented in three phases: 1) results of the first group surveyed including Division I athletes, 2) results of the second group of athletes and non-athletes surveyed from a small Division III college, and 3) combined group comparisons.

### Division I Athletes

*Athletic Identity and Physical Activity Relationships.* Pearson's correlation and regression analysis were used to determine the relationship between athletic identity and physical activity. Specifically, the AIMS total was used as a predictor of the Godin total to address the main research question. The AIMS total score was positively related to the Godin total ( $r=.360$ ,  $p<.01$ ).

The results of the regression analysis showed that the AIMS explained 12.9% of the variance in physical activity scores,  $F(1, 54)= 8.030$ ,  $p<.01$ .

*Gender Differences.* A one-way ANOVA was used to compare the effect of gender on physical activity scores. Results revealed no significant differences in physical activity levels among male and female Division I athletes,  $F(1,54)= .338$ ,  $p=.563$ . A second ANOVA was also used to compare the effect of gender on athletic identity scores. Again, there were no significant gender differences in athletic identity,  $F(1,54)= .219$ ,  $p= .642$ .

### **Division III Athletes and Non-Athletes**

*Athletic Identity and Physical Activity Relationships.* Pearson's correlations and regression analysis were repeated with the second group of Division III athlete and nonathlete alumni to investigate the primary research question regarding the relationship between athletic identity and physical activity. Pearson's correlation indicated that the AIMS was positively related to physical activity for the alumni of the small college ( $r=.371, p<.01$ ). Results of the regression analysis showed that the AIMS significantly explained 13.7% of the variance in physical activity among the small college alumni,  $F(1, 47)= 7.481, p<.01$ .

*Gender and Group Differences.* A two-way ANOVA was used to compare the effects of athlete status and gender on physical activity levels. In contrast to the findings with the Division I former athlete sample, the male alumni from the small college reported significantly higher physical activity than the female alumni,  $F(1,45)= 9.72, p<.01$ ; however, there was no significant difference in physical activity participation between the former athletes and non-athletes,  $F(1,45)=1.354, p= .251$ . There was no significant interaction,  $F(1,45)= 2.743, p=.105$ .

A second two-way ANOVA was used to compare the effects of athlete status and gender on athletic identity scores. Again contrasting the findings with the Division I former athlete sample, male alumni had significantly higher athletic identity scores than female alumni,  $F(1,45)= 5.839, p=.02$ . The former Division III athletes also reported higher athletic identity than the non-athletes,  $F(1,45)= 11.040, p<.01$ . There was no significant interaction,  $F(1,45)=.672, p=.417$ .

### **Combined Groups**

*Athletic Identity and Physical Activity Relationships.* To reflect the primary research question comparing athletic identity and physical activity relationships, Pearson's correlations and regression analyses were used with the three groups combined. The overall correlation between the AIMS and Godin total was positive and significant,  $r=.322, p=.001$ . The regression analysis indicated that the AIMS explained 10.4% of the variance in physical activity scores,  $F(1, 103)= 11.956, p=.001$ . However, when non-athletes were removed from the analysis, athletic identity had a higher correlation with physical activity ( $r=.428, p<.001$ ) and significantly explained 18.3% of the variance,  $F(1,72)=16.14, p<.001$ . Thus, the relationship between athletic identity and physical activity appears to be particularly strong for former athletes compared to the non-athletes ( $r=.196, p=.291$ ).

*Physical Activity and Athletic Identity Group Differences.* A 2x3 factorial ANOVA was used to compare the effects of gender and athlete status (former Division I athlete, former Division III athlete, non-athlete) on physical activity levels. Results of the ANOVA indicated male alumni were significantly more active than female alumni,  $F(1,99)= 9.068, p= .003$ . There were no group differences in physical activity levels based on athlete status, indicating that amount of reported weekly physical activity did not differ among Division I former athletes, Division III former athletes, or non-athlete alumni,  $F(2,99)=1.065, p=.349$ . The interaction effect did not reach significance,  $F(2, 99)= 2.760, p= .068$ .

A second 2x3 factorial ANOVA was used to compare the effect of gender and athlete status on AIMS scores. Results of the ANOVA revealed that male alumni had significantly higher AIMS scores than female alumni,  $F(1, 99)= 6.691, p =.011$ . There was also a main effect for athlete status,  $F(2,99)= 11.732, p<.001$ . Tukey's post hoc analyses clarified that both Division I and Division III former athletes had higher athletic identity scores than non athlete alumni ( $p<.001$ ). Athletic identity scores of former Division I and Division III athletes were not significantly different ( $p=.981$ ). There was no significant interaction effect for gender and athlete status,  $F(2,99)= 2.082, p= .130$ .

**Table 3. Stage of Exercise for Former Athletes and Non-Athletes**

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Former Athletes					
Div I	1	5	7	6	37
Div III	0	1	2	2	13
Total (M/F)	1 (0/1)	6 (1/5)	9 (3/6)	8 (2/6)	50 (23/27)
Non-Athletes (M/F)	1 (0/1)	4 (2/2)	5 (1/4)	10 (4/6)	11 (1/10)

**Table 4. Changes in Physical Activity Since College**

	Less Active	Same More	Active
Former Athletes			
Div I	47	6	3
Div III	11	4	3
Total (M/F)	58 (21/37)	10 (5/5)	6 (3/3)
Non-Athletes (M/F)	8 (4/4)	12 (3/9)	11 (1/10)

*Physical Activity Levels and Changes Across Groups.* In addition to the main measures of athletic identity and physical activity, participants were asked to complete the stage of exercise change measure. Participants were asked to indicate how regularly active they were based on the following five stages: 1) currently inactive with no intention of exercising regularly within the next 6 months, 2) currently inactive with the intention to start exercising regularly within the next 6 months, 3) currently inactive but intend to start exercising regularly in the next 30 days, 4) currently active but exercising regularly for less than 6 months, and 5) currently active and exercising regularly for more than 6 months. Table 3 provides frequency counts for former athletes (Division I and III) and non-athletes who fell into each of the five stages. Results of a chi-square analysis indicated that a higher proportion of former athletes reported being in the maintenance stage (exercising regularly for more than 6 months),  $\chi^2(4)=10.922, p=.027$ . Similar proportions of athletes and non-athletes reported being in the inactive stages. A similar chi-square analysis revealed no gender differences across the stages,  $\chi^2(4)=1.960, p=.743$ . In addition to the stage measure, participants responded to a one-item question regarding how their physical activity had changed since college: less active now, about the same, or more active now. Table 4 shows change in physical activity frequencies for the former athletes (Division I and III) and non-athletes. A chi-square analysis comparing changes in physical activity levels

after college revealed that there was a clear difference between the former athlete groups and the non-athlete group,  $\chi^2(4) = 29.404, p < .001$ . In general, the former athletes tended to report a drop in their physical activity after college whereas non-athletes were just as likely to stay the same or even increase their physical activity after college. No gender differences were observed,  $\chi^2(2) = 1.235, p = .539$ .

## **DISCUSSION**

The main purpose of this study was to investigate the relationship between athletic identity and physical activity levels among male and female former college athletes. Consistent with our hypothesis, higher athletic identity scores were related to higher physical activity levels. The Athletic Identity Measurement Scale (AIMS) showed a moderate, positive relationship with physical activity engagement among alumni who were college athletes. The relationship was stronger for former athletes than non-athletes. These results support identity theory framework and suggest that physical activity behavior is consistent with and predicted by athletic identity.

As we had expected, male college alumni reported a higher athletic identity than female alumni overall, though there were no gender differences among the Division I former athletes. Further, differences in athletic identity between athletes and non-athletes were stronger than were gender differences. Both Division I and Division III former collegiate athletes identified more as athletes than the non-athlete alumni did, and did not differ from each other. Male college alumni were also on average more active than their female counterparts, which is consistent with patterns in the general population (Caspersen, Pereira, and Curran, 2000; CDC, 2011), although again, there were no gender differences among the Division I former athletes. The gender patterns for athletic identity and physical activity among the Division I athletes contradict findings with the general population (Brewer, Van Raalte, and Linder, 1993; CDC, 2011). Perhaps athletes who have competed at more elite levels, such as the Division I sample, maintain athletic identities that preclude clear gender differences in athletic identity and physical activity. This is consistent with Gill, Kang and colleagues' (Gill, 1999; Kang, Gill, Acevedo and Deeter, 1990) findings that gender differences in sport competitiveness do not hold at more elite levels of sport.

While the former athletes reported higher athletic identity, the former athlete alumni were not significantly more active presently than alumni who were not collegiate athletes, and this effect was consistent across gender. This finding contradicted our hypothesis that former athletes would report higher physical activity levels than non-athletes. Although former athletes reported higher athletic identity scores, this apparently did not translate into significantly more physical activity engagement among former athletes. Self-concept is multidimensional (Marsh, 1990), and individuals may have several salient, and possibly confounding, identities that may influence their behaviors. Given that a lot of variance in physical activity was still unexplained by athletic identity, future studies might consider other identity roles and factors that may contribute to or interfere with physical activity engagement among college graduates.

It appears that although college athletes are very active while in college, they are no more active than non-athletes after college. While a greater proportion of former athletes reported being in the maintenance stage of exercise, their overall physical activity levels were not different from non-athletes, and a similar proportion of former athletes and non-athletes reported being inactive.

This contradicts Sparling and Snow's (2002) findings that amount of physical activity participation after college was related to how active individuals were while in college. Clearly, athletes engage in very active lifestyles while participating in college; however, once they conclude their college athletic careers they may be no more likely to participate in physical activity than non-athletes.

Overall, an evident decline in physical activity after college was found for this sample - even greater than numbers reported by Calfas and colleagues (1994) or Sparling and Snow (2002). This is clearly due to the specific inclusion of former athletes in the present sample. As we had anticipated, the former athletes were more likely to report a drop in physical activity compared to alumni who were not college athletes. The large majority (78.4%) of former athletes reported being less active now than they were in college compared to 25.8% of non-athlete alumni. In fact, non-athlete alumni were likely to report maintaining their physical activity and even becoming more physically active after college. Close to a third of the former athletes, who once participated in the rigorous physical activity demands of collegiate athletics, reported that they were currently inactive or had been so at one point in the past six months.

Because the primary goal of collegiate athletes' training and physical activity is skill improvement and preparation for success during competition (Adler and Adler, 1991), the decline in participation seen in members of this study may reflect a loss of these motivational factors. Further, Theberge (2007) has suggested that competitive athletes do not engage in physical activity for the purpose of maintaining or improving health. Because maintenance of mental and physical health is a great benefit and motivator of lifelong physical activity for many post-collegiate adults, former athletes who lack this value for activity may not continue to engage in physical activity post-competitively. Many highly competitive athletes may value physical activity because it serves as a means for improving their ability to play their chosen sport. Once they retire from that sport, athletes may find it difficult to engage in those same types of physical activity because it no longer serves its original purpose. This may be a particular challenge for those athletes whose identities revolve around a performance narrative focused solely on competitive sport (Douglas and Carless, 2009). Future interventions that promote physical activity engagement among former athletes might help athletes focus on other positive benefits of physical activity besides enhancing sport performance.

If, as Witkowski and Spangenburg (2008) suggest, cessation of regular exercise among former athletes leads to metabolic issues, changes in body composition, and increased susceptibility to certain types of chronic diseases such as diabetes and cardiovascular disease, then a substantial portion of the current sample may be at risk for these health concerns. Additionally, research suggests that physical activity can play a protective role against depression among former elite athletes as they age (Backmand, Kaprio, Kujala, and Sarna, 2003). Thus, interventions that track and promote lifestyle physical activity among graduating student-athletes are warranted. These interventions should focus on educating retiring and retired student-athletes about health-related physical activity options and, specifically, how they differ from the physical activity involved in collegiate sports participation. Specific information regarding goal setting, exercise programming, and skill development in areas outside of the athletes' sport should be addressed.

## **Limitations and Future Directions**

The current study is limited in several ways, including the descriptive survey methodology and sample from only two institutions located in the same city. It is impossible to draw conclusions about any causal relationship, and the factors underlying the positive relationship between athletic identity and physical activity are not fully explained. Future research might further explore this complex relationship with larger samples and varied methodologies. A longitudinal study with interview, focus group, and survey data collected before, during, and after retirement from college sports might better demonstrate how physical activity and athletic identity actually change through the retirement process and in relation to each other.

While there are limitations, this study is one of the first to examine athletic identity and physical activity levels of former college athletes. This information is essential if we are to design effective programs to foster lifelong physical activity participation among transitioning student-athletes. Given the high visibility of college sports and the large number of college athletes, understanding the issues related to retirement from sport, including continued engagement in healthy physical activity, is important. Researchers and practitioners are charged with the task of discovering ways to encourage healthy lifestyles and participation in lifelong physical activity among the 400,000 NCAA student-athletes who participate in college sports each year, all of whom will eventually retire from college sports and face their own set of post-college challenges.

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