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Faculty and male student athletes in higher education: Racial differences in the environmental predictors of academic achievement

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Faculty and male student athletes: racial differences in the environmental predictors of academic achievement

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Studies have examined the impact of environmental variables on academic achievement among student athletes in the revenue-generating sports of men's basketball and football. However, while evidence concerning the positive impact of male student athlete and faculty interaction is virtually unequivocal, we are not certain whether the benefits accruing from particular types of interaction vary across different racial/ethnic groups. This study explores the relationship between male Black and White student athletes and faculty as well as the impact of specific forms of student athlete–faculty interaction on academic achievement. Data are drawn from the Cooperative Institutional Research Program's 2000 Freshman Survey and 2004 Follow-Up Survey. The sample includes 1031 White and 739 Black football and basketball players attending predominantly White institutions. Regression results indicate that the impact of the contact or interaction is to some extent contingent upon the specific nature of the interaction for Black and White male student athletes. The findings also suggest that Black and White male student athletes did not benefit equally from their interactions with faculty. Finally, the implications of these findings are discussed among student athletes, faculty and student affairs leaders in order to improve male Black and White student athlete–faculty communication, as well as enrich their overall college experience.

Introduction

For a number of decades researchers have discussed the differences between Black and White male college student athletes. Much of this discussion has focused on racial differences in sport performance and patterns in athletic participation (Edwards, 1972; Sailes, 1984) as well as differences in psychosocial needs and experiences of Black and White student athletes' in their sport and academic environment (Anshel & Sailes, 1990; Lawrence, 2001). In addition, related studies have focused on racial differences in academic achievement among student athletes and have

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shown that college grade point average (GPA) is influenced by pre-college experiences, demographic factors and academic ability (Lang *et al.*, 1988; Sellers, 1992). While these studies yield relevant information relative to selected predictors of academic performance among college student athletes (Siegel, 1994), few investigators are concerned with the environmental affects on student athletes' educational outcomes (Sellers, 1992; Comeaux, 2005). The college environment encompasses all that happens to student athletes during the course of their educational programs, which may influence the intellectual desired outcome—to matriculate and graduate (Astin, 1993b).

Much of the college achievement research examines traditional student experiences on campus. Previous research on traditional students suggests that their involvement in college, namely students' involvement with other students and faculty, are important factors for student success (Tinto, 1987; Astin, 1993a, b). Studies have also revealed the effect of involvement on achievement for certain student groups. For example, Allen (1988) reported in a sample of Black traditional students that their relationship with faculty was an important predictor of academic success. Despite the research on college students, there is little extant research on student athletes and their life experiences on campus (Sailes, 1993; Engstrom *et al.*, 1995; Baucom & Lantz, 2001; Shulman & Bowen, 2001; Comeaux, 2005).

One facet of the environmental experience involves student athletes' interaction with faculty members. While evidence concerning the positive impact of male student athlete–faculty interaction is virtually unequivocal (Comeaux, 2005), we are not certain whether the benefits accruing from particular types of interaction vary across different racial/ethnic groups. To understand further the conditional effects of student athlete–faculty interaction by race/ethnicity, this study explores the relationship between male student athletes' race/ethnicity and faculty as well as the impact of specific forms of student athlete–faculty interaction on academic achievement. Specifically, this study examines whether selected faculty interaction measures of academic achievement differ between Black and White student athletes in the revenue-producing sports of men's basketball and football. The authors felt it necessary to recognize and explore a group within the college community, such as faculty, who frequently interact with and influence student athletes' personal and academic development. In addition, because the faculty population remains predominantly White within degree-granting institutions in the USA, Black student athletes often interact with faculty whose race or ethnicity is different from their own, which may have implications for their learning.

Theoretical framework

This study employs Astin's Student Involvement Theory as a framework for understanding the impact of student involvement on campus. Student involvement on college campuses may be one of the most important factors influencing their academic success (Astin, 1985, 1993a, b; Pascarella & Terenzini, 1991; Tinto 1993). Astin's (1985) 'student involvement' theory is perhaps the most widely adopted in

terms of researching and analyzing student development. According to Student Involvement Theory, 'the individual plays a central role in determining the extent and nature of growth according to the quality of effort or involvement with the resources provided by the institution' (Pascarella & Terenzini, 1991, p. 51). Student Involvement Theory is based on the notion that individuals invest psychological energy in aspects outside of themselves, such as friends, family, schooling, jobs and other similar variables. Astin (1984, p. 27) defines 'involvement' as 'the amount of energy that the student devotes to the academic experience'. Indeed, research indicates that the more time and energy students devote to learning and the more intensely they engage in their own education (e.g. student athlete interaction with faculty members), the greater their potential outcomes for achievement, satisfaction with educational experience, and persistence in college (Pascarella & Terenzini, 1991; Tinto, 1993). Because student–faculty interaction is an important predictor of academic success, we conceptualize student involvement in terms of interactions with faculty (Astin, 1993a, b). Other types of involvement, such as participation in student government, volunteer work and studying with other students also influence academic success, but are not the focus of this study.

Methodology

Sample

The data in this study are from the Cooperative Institutional Research Program (CIRP) 2000 Student Information Form (SIF) and 2004 College Student Survey (CSS) that is sponsored by the Higher Education Research Institute (HERI) at the University of California at Los Angeles (UCLA) and the Graduate School of Education and Information Studies. Although the reliability of the instrument has not been formally measured during the past 30 years the CIRP has generated an array of normative, substantive and methodological research about a wide range of issues in American higher education (Sax *et al.*, 1996). Research based on CIRP data was found by one researcher to be the most widely cited in American higher education research (Budd, 1990).

The CIRP data used in this study included information drawn from two surveys: the 2000 Student Information Form (SIF) and the 2004 College Student Survey (CSS). The 2000 SIF was administered to first-time college freshmen during orientation programs in the first weeks of Fall classes. Responses to the SIF were received from 251,232 students at 494 institutions. The CSS was administered to fourth-year students in the spring of 2004, and as a result 38,964 responses were received from 161 institutions. Of the total number of students, 14,975 students filled out both the SIF in 2000 and the CSS in 2004.

The primary purpose of the CIRP is to provide baseline data on entering college freshmen so that they may be followed up over time in order to assess how college contributes to student learning and development. The CIRP data set offers an extensive set of longitudinally collected variables with which to answer a variety of

questions pertaining to student success and retention patterns in higher education. In addition, a known strength of the CIRP data set is its abundance of student input and environmental variables that can be associated with the dependent variable or outcome. Student input characteristics are assessed prior to exposure to the environment, and the characteristics of the environment are assessed prior to the assessment of the outcome.

The specific sample used for this study included White and Black, male, revenue-generating student athletes attending predominantly White institutions. We chose to limit our sample to Black and White revenue-generating student athletes because preliminary analysis of data revealed that revenue-generating athletes are different from non-revenue athletes in graduation rates, National Collegiate Athletic Association (NCAA) infractions and overall visibility in American culture (Eitzen, 1999; Coakley, 2003). The final sample includes 1770 students (1031 Whites; 739 Blacks) attending four-year colleges and universities.

Research methods

This study employs the 'Input-Environment-Outcome' (I-E-O) model for studying the impact of college variables on students (Astin, 1993a). 'Inputs' refer to the students' entering characteristics; 'environment' is that to which the student is exposed during college (i.e. faculty, peers, diverse views, etc.); and 'outcomes' are the students' characteristics after interacting with the environment (Astin, 1993a). The power of Astin's I-E-O model is its ability to allow researchers to measure student change during college by comparing outcome characteristics with input characteristics. In short, this framework examines the influence of the college environment on student outcomes, by controlling for inputs or pre-college characteristics and experiences.

Blocked stepwise regression analyses were conducted separately for Black and White students on the dependent measure. Each block of independent variables is included in the temporal sequence in which it may have an effect on student outcome. Within each block, variables (significant at $p < 0.001$) enter the regression equation in a stepwise fashion. The value of using a stepwise procedures design is that they allow for an examination of how regression coefficients change as each variable enters the equation (Astin, 1993a). This technique is especially useful for the present study, as analyses focus on how regression coefficients associated with student-athletes' race/ethnicity change as other independent variables are added to the equation.

Outcome variable. The outcome variable in this study is students' self-reported college GPA, a quantitative measure of academic achievement. College grades were obtained from students' self-reported GPA on the follow-up questionnaire. GPA is scored on a six-point scale, from 'A' to 'C or less'. The pretext for this outcome is students' high-school GPA (scored on an eight-point scale, from 'A or A+' to 'D'). The authors recognize that academic achievement encompasses much more than

GPA. However, given the variables within the dataset, college GPA was the most appropriate measure of academic achievement, coupled with the fact that college GPA is the most common outcome when investigating student achievement in higher education (Astin, 1993a, b).

Independent variables. Independent variables are blocked in the following temporal sequence: (1) students' past achievement, family background and high school environmental characteristics (inputs); (2) institutional type and control (environment); and (3) college environmental characteristics (environment). Because the primary focus of this study is the impact of specific forms of student athlete–faculty interaction on academic achievement, independent variables are not limited to those expected to predict a given outcome; rather, many variables are included because they may shed light on the dynamics of racial composition. Independent variables can be classified into the following two categories (some variables may qualify for more than one category): (1) those that previous research has identified as predictive of any of the outcome measures used in this study; and (2) those that are included on an exploratory basis because they may mediate the effects of the student athlete–faculty interaction by race/ethnicity.

Input variables. Student background characteristics (Block 1) include measures of past achievement, family background and high-school environmental characteristics. The coding scheme for these variables is listed in the Appendix. Past achievement measures consist of students' self-reported high-school GPA. The importance of high-school GPA as a control variable when examining college GPA is well documented (Sellers, 1992; Astin, 1993a, b).

Family background measures include socioeconomic status (defined as a composite of mother's and father's educational attainment, as well as students' estimate of their parents' income). It was expected that these family characteristics would influence students' expectations about college, as well as their likelihood of interacting in certain college environments.

Finally, high-school environmental characteristics consist of student athlete and teacher relation measures (see Appendix). The significance of incorporating these measures was to eliminate self-selecting students, thereby decreasing the chance of a type I error (finding a relationship between the environment and the outcome measure when a relationship does not exist). It was impossible to eliminate all possible biasing input variables; however, the goal was to minimize the probability of a type I error.

Environmental measures. Measures of the college environment consist of institutional type and control (Block 2) and interaction with faculty (Block 3). Institutional type is defined as university or four-year college status, while institutional control is defined as public or private. Institution level variables are included to determine

whether student athletes are more likely to interact with faculty in universities or four-year state schools and public or private institutions. The final block contains the student athlete–faculty interaction variables. These five measures asked students to respond to the following statement: 'Faculty provided encouragement for graduate school, Faculty provided emotional support and encouragement, Faculty provided assistance with study skills, Faculty provided negative feedback about academic work, and Faculty provided help in achieving professional goals.' The importance of student–faculty relationship is well documented as a valuable aspect of the college student experience (Pascarella *et al.*, 1983; Astin, 1993a; Milem & Berger, 1997). Given the lack of research in this content area, the present study is a necessary beginning to advance our knowledge on the environmental factors that influence the academic success of male, revenue-generating student athletes.

Results

Because this study is concerned primarily with selected faculty interaction measures of academic achievement and whether they differ between Black and White student athletes in revenue-producing sports, the presentation of results focuses on the relationship between that environmental measure and the outcome. The effects of pre-college variables on the outcome are presented and discussed only when they appear to vary across racial/ethnic groups.

In order to assess the 'effect' of selected pre-college variables and environmental measures on academic achievement, the standardized regression coefficient (Beta-In) was examined at each step in the regression. The Beta-In (as reported in SPSS-X regression results) is the Beta coefficient a variable would receive if it entered the regression equation at the next step; all variables have a Beta-In irrespective of whether they enter a regression.

Tables 1 and 2 provide summary tables of simple correlations for the outcome, as well as Beta-In at each step: (1) after controlling for pre-college (input) characteristics; and (2) after controlling for measures of the environment. The purpose of this section is to examine the relationship between that environmental measure and the outcome by determining how this relationship changes throughout the regression, without addressing specifically how or why such changes occur (that discussion is saved until the next section).

Relationships explained by input effects

When pre-college (input) characteristics are controlled (Block 1), White student athletes' high-school GPA is the most powerful predictor of college GPA (beta 1 = 0.46, $p < 0.001$; see Table 1). Likewise, high-school GPA is also the most powerful predictor of college GPA for Black college student athletes (beta 2 = 0.31, $p < 0.001$; see Table 2). Together, these findings suggest that high-school GPA has a greater effect on college grades for White student athletes than Black student athletes (beta 1 = 0.46 compared with beta 2 = 0.31). That is, in terms of high-school GPA, White

Table 1. Predicting academic achievement (college GPA) among White male student athletes in revenue-generating sports

Step	Variable			Beta^ after step			
		R	*r*	1	2	3	4
Input	Entering:						
1	High-school GPA (pretest)	0.49	0.49	0.49	0.47	0.47	0.46
Environment	Entering:						
2	Faculty provided encouragement for graduate school	0.53	0.25	0.20	20	0.15	0.16
3	Faculty provided help in achieving professional goals	0.54	0.20	0.17	0.10	0.10	0.12
4	Faculty provided assistance with study skills	0.54	0.20	0.04*	−0.03*	−0.07	−0.07
	Not Entering:						
	Father's education						
	Mother's education						
	Parental income						
	Asked teacher for advice						
	Talking with teachers outside of class						
	Institutional Control						
	Institutional Type						
	Faculty provided emotional support						
	Faculty provided negative feedback about academic work						

Data source: 2000 Freshman Survey (CIRP) and 2004 College Student Survey (CSS), Higher Education Research Institute, UCLA

^The coefficient for any variable not yet in the equation shows the beta that variable would receive if it were entered into the equation at the *next* step

*not significant

Table 2. Predicting academic achievement (college GPA) among Black male student athletes in revenue-generating sports

			Beta^ after step			
Step	Variable	*R*	*r*	1	2	3
Input	Entering:					
1	High-school GPA (pretest)	0.33	0.33	0.33	0.33	0.31
Environment	Entering:					
2	Institutional control	0.39	0.21	0.20	0.20	0.18
3	Faculty provided encouragement for graduate school	0.43	0.24	0.21	0.20	0.20
	Not Entering:					
	Father's education					
	Mother's education					
	Parental income					
	Asked teacher for advice					
	Talking with teachers outside of class					
	Institutional type					
	Faculty provided emotional support					
	Faculty provided assistance with study skills					
	Faculty provided negative feedback about academic work					
	Faculty provided help in achieving professional goals					

Data source: 2000 Freshman Survey (CIRP) and 2004 College Student Survey (CSS), Higher Education Research Institute, UCLA

^The coefficient for any variable not yet in the equation shows the beta that variable would receive if it were entered into the equation at the *next* step

student athletes begin college with an advantage for academic success, as Black students tend to enter college with lower high-school grades (Sellers, 1992; Astin, 1993a).

Relationships explained by environmental effects

While the entry of high-school grades (input) has a strong effect on academic achievement, the entry of the college environment leads to generally smaller effects in the relationship between faculty measures and the outcome. Of course, the relatively smaller 'mediating' power of the environmental block is due in part to the natural correlation between inputs and environments; much of the potential 'impact' of the environment has already been accounted for by students' high-school grades.

For White student athletes, three faculty interaction variables had a significant impact on their college GPA, while only one faculty interaction variable influenced Black student athletes GPA for this study. With respect to White student athletes, the

data reveal that the environmental measure 'faculty provided encouragement for graduate school' had a fairly strong positive relationship with college GPA (beta = 0.16, $p < 0.001$; see Table 1). Similarly, when controlling for this faculty measure, Black student athletes had a positive relationship with college GPA (beta = 0.20; see Table 2). These findings suggest that both White and Black student athletes who are encouraged to attend graduate school by faculty tend to get high GPAs. The data also show that for White student athletes there is a positive relationship between the environmental measure 'faculty provided help in achieving professional goals' with college GPA (beta = 0.12, $p < 0.001$), suggesting that those who are provided assistance in achieving professional goals by their instructors tend to perform better academically in college. The final environmental variable entering the regression for White student athletes is 'faculty provided assistance with study skills', indicating a small yet negative relationship to college GPA (beta = –0.07). That is, White student athletes who receive assistance with their study skills from faculty tend to receive lower college GPAs. And, lastly, institutional control had a positive relationship with college GPA for Black student athletes (beta = 0.18; see Table 2), suggesting that those attending private institutions tend to have higher college GPAs than those attending public institutions.

Discussion

This study provides some evidence that pre-college characteristics and the college environment affect White and Black student athletes' college GPA slightly differently. High-school GPA continues to be a strong predicator of subsequent academic achievement in college for both White and Black male student athletes. However, White student athletes' high-school GPA was a stronger predictor of college GPA compared with their Black counterparts. With White student athletes receiving higher cumulative high-school GPAs than Black student athletes, it appears that many of these Black student athletes matriculate from high schools and environments with inferior academic resources and tend to be less academically prepared (Lang *et al.*, 1988; Sellers, 1992). Thus the fact that Black male student athletes enter college with lower academic credentials suggests the need for effective intervention aimed at Black male experiences while on campus.

The entry of college environment variables gave relatively strong predictors of academic success for Black and White student athletes in this study, lending support to Student Involvement Theory. As discussed earlier, much of the effect of the environment is already accounted for by the input characteristics (high-school GPA) in the previous block, since student input characteristics are naturally correlated with college environments.

For both Black and White student athletes in the revenue-producing sports of men's basketball and football academic success is to some extent dependent on the specific nature of their interaction with faculty. For example, faculty who provided encouragement for graduate school makes a strong contribution to both White and Black student athletes' academic success. However, faculty who provided help

achieving professional goals had a positive impact on college GPA for White student athletes, whereas this variable did not enter the regression equation for their Black counterparts. Further, as the regression analyses indicate, faculty were more likely to provide help to White student athletes with study skills. Such a finding is not surprising since students generally tend to seek assistance with their study skills when they are not doing well academically. Unlike their White counterparts, Black student athletes perhaps did not enter the regression equation for the aforementioned faculty measures because of the ways in which they perceive and respond to the college environment and the fact that have limited informal information exchange with White faculty and students (Allen, 1992). There is usually considerable social distance and alienation from campus life perceived by Black students on predominantly White campuses (Hurtado, 1992), and they may feel discomfort from their lack of knowledge and experience interacting with students and faculty different from themselves (Schwitzer *et al.*, 1999). An article in the *Chronicle of Higher Education* reports that Black student athletes feel that they are marginalized and are not taken seriously by White professors in the classroom and on campus (Perlmutter, 2003). The college experiences of Black student athletes at predominantly White institutions are often times hindered as a result of feelings of social isolation, racial discrimination, limited support and lack of integration. Thus, Black student athletes may choose to spend as little time as possible with White faculty, who comprise approximately 89% of faculty at predominantly White institutions, and instead interact and bond with mentors and other support systems off campus where they emphasize feelings of encouragement, acceptance and connection. These notions are well documented by previous studies on Black students' college experience at predominantly White institutions (Sedlacek, 1987; Allen, 1992; Hurtado, 1992; Davidson & Foster-Johnson, 2001).

Program and policy implication

Given the relationship between academically oriented interactions and student athletes' success, this study argues for institutions to encourage a wide range of forms of faculty communication and mentoring that are responsive to the needs of both Black and White male student athletes of different abilities (Redmond, 1990). When designing such programs, attention should also be given to the practices of the specific academic support programs at hand and how they can potentially affect student athletes who enter the institution with differing educational characteristics. Since some student athletes enter college performing at lower academic levels than their peers, faculty, advisors and student affairs leaders must be well advised to appreciate their situation and work closely with these students in identifying factors that may impede or facilitate their academic talent development or self-identity. In recent years a public University, for example, implemented a concept coined 'scholar baller' (Harrison, 1995) that offers academic support and development strategies to student athletes within the college environment (Harrison & Boyd, 2005). 'Scholar baller' engages the self with institutional structures and practices that are centrally aligned with ones own culture (Harrison & Lampman, 2001; Harrison, 2002). As such, this

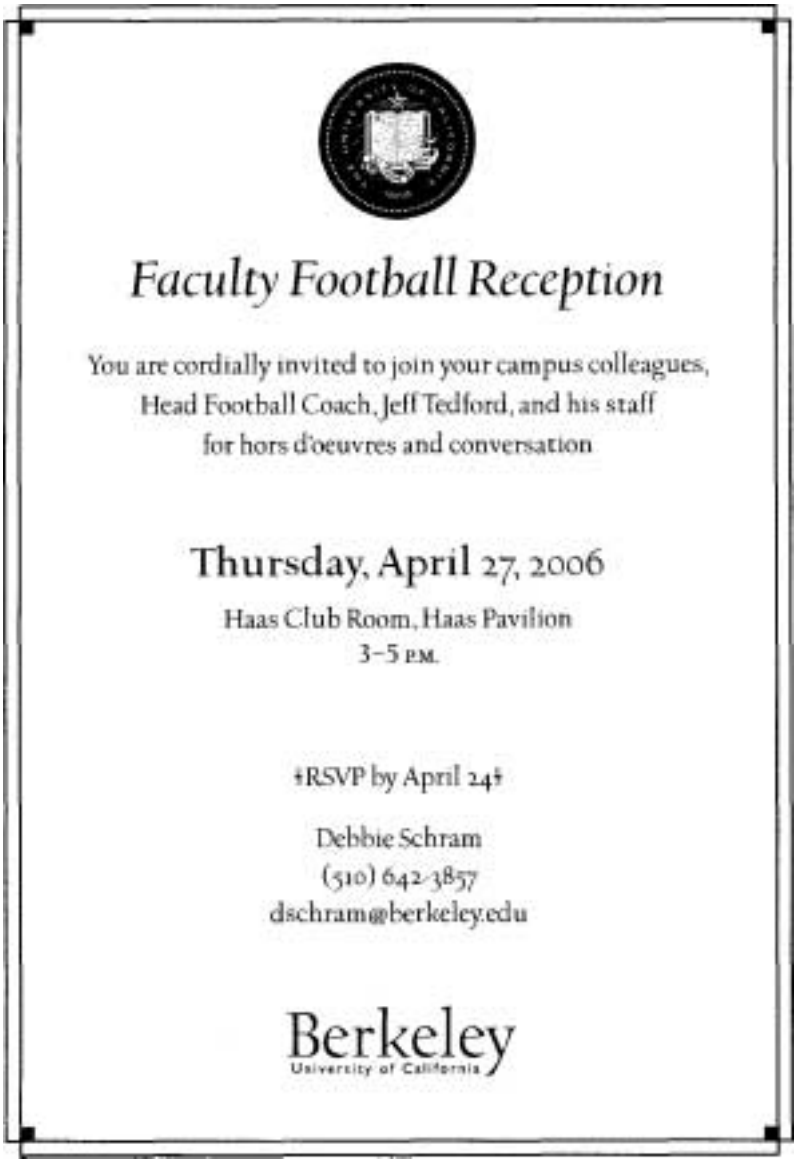

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Figure 1. Connecting faculty to the athletic culture at UC Berkeley

concept (along with its critical pedagogical strategies) creates a cultural identity and mindset among student athletes from various backgrounds regarding their perceptions about educational aspirations and sport commitment within the college culture. Such pedagogical strategies include 'connect with the intellect', that is a panel of faculty in part engage student athletes in a dialogue about the ways in which to form meaningful relationships with professors on campus—conceivably leading to academic success and positive career development. 'Scholar baller' differs from other

institutions with high-profile and non-revenue sports programs because it adds cultural depth to athletic departments' academic support services; moreover 'scholar baller' connects with popular and contemporary culture to enhance academic excellence as opposed to traditional academic support programs that focus on rigid grade checks and study hall routines that all too often ill-prepare or fail to empower student athletes (Sellers, 2000). We continue to suggest that the exemplar of quality faculty–student athlete relationships contributes further to the 'scholar baller' ideology of cultural connections on campus and society that transcends pre-college characteristics and increases the likelihood of matriculation, graduation and success. Because of its effectiveness, 'scholar baller' has received unprecedented support from various constituents associated with the institute of higher learning (see Steinbach, 2004).

Furthermore, since the quality and nature of formal and informal communication and faculty interactions with student athletes is also essential to both academic achievement and overall college experience, academic and social activities (e.g. research projects, faculty attendance at sporting events and team lunches, etc.) between student athletes and faculty members should be encouraged (Pascarella *et al.*, 1983; Milem & Berger 1997; Comeaux, 2005). In past years, faculty at some colleges and universities have participated in sideline coaching on game day and other mentoring programs to foster a better understanding of the roles of student athletes and coaches in intercollegiate athletics. Such programs at the University of California, Berkeley (see Figure 1), Vanderbilt University and Arizona State University (ASU) have proven to create stronger connections between the faculty and student athletes. Specifically, ASU continues to improve its faculty–student athlete relationships by focusing on two aspects: (1) Communications Committee; and (2) Faculty Awareness & Engagement Initiative. The crux of this initiative is to 'focus on the needs and academic achievements of student-athletes, and the opportunity to systematically strengthen student-athlete and faculty bonds and culture'. Examples of programmatic efforts by this initiative include periodic targeted communication about academic accomplishments and issues focusing on the use of ASU web and *Insight* (faculty publication at ASU) with an occasional direct mailing, an annual or bi-annual *Insight* insert featuring academic accomplishments, potential adaptation of Devils (school mascot) Domain web communication for faculty, and a rotation of informational meetings with colleges, faculty groups and across campuses. These are a few, but nonetheless important cultural and environmental directions for faculty and student athletes. In this sense, higher education may need to reconsider the reward structure and think creatively about new incentives, in order to: (1) succeed in its efforts to improve faculty–student interaction; (2) be responsive to the needs of certain student groups; and (3) improve faculty morale of dealing with the impact of intercollegiate athletics. In doing so, faculty members will become more exposed to the culture of this special population of students and begin to cultivate meaningful relationships.

Finally, faculty and others who frequently interact with student athletes could also benefit from learning about the types of conscious and unconscious prejudices and discriminatory attitudes directed toward student athletes. Mandatory training

workshops on race, racism, diversity and cultural sensitivity toward certain groups on campus would improve the college community and contribute to the creation of equitable educational opportunities for all students. Concurrently, student athletes could benefit by perpetuating more positive images in a classroom atmosphere by increased participation in classroom discussion, regular attendance and communicating with faculty members outside of class (Jaasma & Koper, 1999).

Limitations and future research

While the present study produced useful findings and has implications for institutional practices pertaining to student athletes, as outlined in the previous section, it is not without limitations. The sample was not random and thus, generalizations from this study should be made with caution and consideration of these factors. In addition, the lack of causal direction among the environmental measures and the dependent variable was another limitation of this study. That is, do student athletes who interact with faculty, depending on the form of interaction, receive higher grades or is it because those with higher grades are more likely to pursue interaction or contact with faculty? Future qualitative studies that explore student athletes' experiences with faculty inside and outside the classroom might be successful in answering such uncertainties. Additionally, the voices of student athletes themselves are critical to addressing this issue at both the theoretical and practical level (Benson, 2001).

And, finally, the present study focuses on whether selected faculty measures of academic achievement differ between Black and White student athletes, yet it is not known whether faculty members' race/ethnicity, gender, college affiliation or involvement in intercollegiate athletics play a role in the types and magnitude of interaction between White and Black student athletes and faculty. For example, the fact that Black student athletes feel that they are marginalized by White professors on campus, as discussed earlier, may cause the degree of contact to vary dramatically by race. In future studies, it may useful to control for faculty characteristics to understand better the impact of specific forms of student athlete–faculty interaction to outcomes of college. This information will be most useful to faculty who are exposed to the competitive sport model in American higher education and its constraints, as they attempt to interact and empower student athletes for optimal academic performance.

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Appendix

Student background and involvement characteristics

Block	Variables	Measures
Block 1 (input)	Background measures	
	Average high school grades (self-report)[a]	
	Socioeconomic status (SES)	Mother's education[b]
		Father's education[b]
		Parental income[c]
	Interaction with faculty (high school)	Asked a teacher for advice after class[d]
		Talking with teacher outside of class[e]
Block 2 (environment)	Institutional type and control (dichotomous measures)	
	Public	
	Private	
	University	
	4-year college	
Block 3 (environment)	Interaction with faculty (college)	Faculty provided encouragement for graduate school[d]
		Faculty provided emotional support & encouragement
		Faculty provided assistance w/ study skills
		Faculty provided negative feedback about academic work
		Faculty provided help in achieving professional goals

[a]Eight-point scale: 1 = 'D' to 8 = 'A or A+'

[b]Eight-point scale: 1 = 'grammar school or less' to 8 = 'graduate degree'

[c]Fourteen-point scale: 'less than $6000' to 14 = '$150,000 or more'

[d]Three-point scale: 1 = 'not at all' to 3 = 'frequently'

[e]Eight-point scale: 1 = 'none' to 8 = 'over 20'