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**The Impact of Football Bowl Subdivision Head Coaching Changes on NCAA  
Academic Progress Rate**

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*Based on Complex Adaptive Systems theory, a head coach change is likely to impact players in a number of ways. To measure the potential impact on Academic Progress Rate (APR), all head coaching changes in NCAA Division I FBS football ( $n = 160$ ) between the academic years of 2003-04 and 2010-11 were examined using the NCAA APR database. Results indicated APR scores in the year of a coaching change were significantly lower than average APR scores, the nature of change (i.e., positive vs. negative) did not impact APR scores, internally hired coaches produced the highest APR scores, teams with the highest winning percentages had the greatest APR scores, and the two variables that significantly contribute to predicting APR in the year of a coaching change were average APR scores and academic year. These results can be used by college athletics stakeholders for academic programming and human resource decision-making during times of coaching transition.*

For many NCAA Division I student-athletes, the increased academic and athletic demands, in combination with the heightened level of independence, places this population at risk of underperforming or leaving higher education altogether (Johnson, Wessel, & Pierce, in press). These concerns are especially salient for football student-athletes who participate at the Football Bowl Subdivision (FBS) level due to the commercialization and academic degradation often associated with elite collegiate athletics (Sperber, 2001; Weiner, 2009). Specifically, the metric used to evaluate the academic eligibility and retention of student-athletes (i.e., Academic Progress Rate [APR]) has revealed FBS football programs to possess some of the lowest scores of all NCAA sports (Hosick, 2011a). At the forefront of this issue, often regarded as the person most responsible for both athletic and academic team performance, are head coaches.

Football head coaches at the FBS level operate in a unique environment with legions of fans and media attention that far outpaces most other college sports. Formerly known as Division 1-A, the FBS is the only NCAA sponsored level of sport that has not used an organized tournament to determine its champion. Although the postseason landscape will change in 2014 with the approval of a 4-team playoff (Dinich, 2012), teams will still compete for one of the coveted Bowl Championship Series games reserved for the best programs in the largest conferences. These bowls have traditionally determined the top finishers in FBS rankings and are accompanied by hefty paydays that often involve coaching bonuses (Rogers, 2008). Such bonuses are in addition to lofty salaries that routinely make FBS head coaches the highest paid employee at their university (Berkowitz, 2012), and several times higher than other coaches in their respective athletic departments. In fact, FBS coaches' salaries have grown from an annual average of \$1.4 million in 2006, to \$2.1 million in 2011. These numbers are staggering when one considers that only 22 out of 120 FBS institutions generated revenue from their athletics programs in 2010, and the remaining 98 FBS institutions operated with a median deficit of \$11.6 million (Sander, 2011). The preceding financial information reveals the level of commercialism and pressure often associated with FBS coaching. Coaches must navigate these high-stakes environments while simultaneously overseeing the well-being of student-athletes on a variety of different levels.

### *Leadership Theory*

Oversight of student-athlete well-being can be complex. To better understand the multifaceted role of a coach, and the potential impact of a coaching change, it is imperative to first frame the current research within leadership and organizational theory. Past research examining leadership change has generally followed one of two directions. The first direction identifies the response to change in terms of a leadership style (Gilmore, 2003; Herold, Fedor, Caldwell, & Liu, 2008). Leaders with a transformational approach (i.e., charismatic, value-driven, and flexible) appear to embrace change by adapting to the situational variables and placing the needs of their followers before other priorities. Thus, the leadership exhibited during a coaching transition (e.g., interim coach or athletic director) would be more effective with a transformational leadership style. The second direction postulates that the leadership style is less important than the leadership behaviors exhibited during change (Gilmore, 2003; Herold et al., 2008; Kotter, 1996). Behaviors such as creating a sense of urgency, providing support, building

coalitions, and allowing input are necessary during times of change (Kotter, 1996). The second direction tends to ignore the link between specific leadership styles and behaviors that are naturally exhibited by such a style. That is, if a leader exhibits the appropriate leadership style, they will naturally exhibit the most appropriate leadership behaviors. Therefore, research that has attempted to merge these different theoretical approaches have found that leadership style, specifically transformational leaders, were more strongly related to followers' willingness to accept change (Herold et al., 2008).

Accepting the premise that leadership style is important to create and adapt to change, it is increasingly important to adopt a theory that describes how leaders fit into the overall system, as well as how the system would be impacted based on a change in leadership. Complex Adaptive Systems theory (CAS; Eidleson, 1997) attempts to explain the importance of each component within a system as it relates to all the other components. CAS theory describes organizations as a diverse network of intertwined systems that are constantly adapting to both internal and external pressures. Changes that take place within the complex system are often non-linear (Cavanagh, 2006), which implies a complicated web of cause-and-effect that is sometimes misinterpreted into simplistic linear rationalization. Moreover, with regard to leadership change, "focusing on the embeddedness of individuals in the complex web or organizational relations allows us to account for changes in the system that occur due to iterative, non-linear processes within the system" (O'Connor & Cavanaugh, 2012, p. 3). From a leadership (i.e., head coach) perspective, CAS theory predicts that when a change in the system occurs, all members within the system adapt to the new information, which causes a ripple effect through the entire system. Furthermore, one of the key components of CAS theory notes the strongest relationships within an organizational system are those which are manifested between individuals in the system, particularly between leaders and followers.

CAS theory is well suited to explain the complex world of college athletics, especially within FBS football programs where the most resources and stakeholders are involved. The Latin term *in loco parentis*, translated *in place of a parent*, captures the complexities of this multifaceted role by insinuating that coaches fill the role of a parent for collegiate student-athletes. Foremost in their responsibilities, head coaches are expected to be the expert and mentor in their sport. They are responsible for program-related tasks including practice plans, game plans, coaching staff, budget allocation, scheduling, public relations, team policy, punishment, and managing the commercial expectations that accompany a large college athletic program (Smith, 2004). Coaches must interact with a variety of people within the system to accomplish their goals. Administrators, advisors, players, assistant coaches, strength training personnel, alumni, parents, donors, and the media are some of the stakeholders with which a coach must interact on a daily basis. This complex series of relationships is intertwined to produce the overall system in which a head coach must operate. For example, with regard to players, coaches influence athletic development, social skills, psychological development, and emotional growth (Field, 1991). Each of these areas is often accompanied by a routine set of expectations and consequences that rely on the communication between coach and player. As one college coach explained;

I think each one of us as coaches, are also sport psychologists because different guys have different buttons and they respond to different things . . . You're their father figure, you're the minister, you're the advisor, and sometimes the warden.

You know, you're all those things. You're their friend if you have the right kind of relationship. (Giacobbi, Roper, Whitney, & Butryn, 2002, p. 173).

Literature supports these complex and multifaceted roles of coaches (e.g., Amorose, 2003; Brubaker, 2007; Bradley, 2005; Gagne, Ryan, & Bargmann, 2003; Lattman, 2008; Lewis, 2004; Schilling, 2007). For example coaches have been found to possess similar characteristics as teachers (Brubaker, 2007), guardians (Schilling, 2007), business mentors (Lattman, 2008), counselors (Bradley, 2005), disciplinarians (Schilling, 2007), injury evaluators (Lewis, 2004), emotional caretakers (Gagne et al., 2003), and psychologists (Amorose, 2003; Thelwell, Weston, Greenlees, & Hutchings, 2008). These roles demonstrate the variety of areas in which a coach has influence on their students-athletes, and reinforces the concept of *in loco parentis* within the framework of CAS theory. In fact, the connection between coach and athlete appears so powerful in college football, that 41% of players indicated they chose their university primarily because of the coach (NCAA, 2011a). Therefore, it stands to reason that coaches are instrumental within a system that includes a variety of complex relationships. One specific area where coaches appear to have a strong influence is academic pursuits (Johnson, 2012).

As one part of the complex system that is FBS intercollegiate football, academic expectations may include individual and team grade point average (GPA) goals, class attendance policies, study hall expectations, regular meetings with advisors or coaches, and routine grade checks (Brooks, Etzel, & Ostrow, 1987; Hollis, 2001; Leslie-Toogood & Gill, 2008). The emphasis placed on these expectations will vary by coach and by the unique system in which each coach must operate. Some coaches enforce strict academic policies, while others may implement a more leisurely approach. Some coaches may have large academic support staffs, while others must rely on assistant coaches to aid in academic supervision. Whatever the case, it is reasonable under CAS theory to assume student-athletes are influenced by coaches' academic expectations (Leslie-Toogood & Gill, 2008). Therefore, when a coaching change occurs, a disruption in the academic culture of the team is likely to occur, especially in football where coaching staffs tend to be fired as groups (Fee, Hadlock, & Pierce, 2006; Gilmore, 2003). This type of disruption may be comparable to implementing a new offensive scheme on the field, or new conduct policies during a season. It is important to reiterate, however, that under CAS theory, a coaching change does not mean the organization (i.e., team) will cease to operate. Since the leader (i.e., coach) is only one part of the complex system, the team can still operate with the assistance of other parts of such a system (e.g., athletic directors, academic support staff, interim coaches, etc.). The coaching change, however, will likely impact the overall effectiveness of the system.

If a leadership change does impact academic outcomes for NCAA FBS football programs, the impact would likely be represented by a change in team APR scores. APR is the most contemporary metric used by the NCAA to evaluate the academic performance of student-athletes. Before APR scores, the previous academic markers used by the NCAA were initial eligibility markers, which are determined before students enter college, and graduation rates, which are calculated six years after students are admitted to college. While enrolled at an institution, the NCAA also monitors grade point average (GPA) and percentage of degree completion to establish ongoing eligibility for individual student-athletes. GPA and eligibility are sufficient for determining how an individual student-athlete is progressing, however, the creation the APR provided real-time academic data for individual athletic teams, and overall institutional athletic culture (Brown, 2005).

The APR is calculated for all “currently enrolled student-athletes receiving institutional financial aid based in any degree on athletics ability” (NCAA, 2004, p. 1). The APR also affects teams that do not offer financial aid, but have recruited student-athletes who are on the team roster. Not included in the APR calculations are walk-on student-athletes. After identifying which student-athletes are included in the APR, eligibility and retention criteria are used to compute APR scores. In one semester a student-athlete can earn two points. One point is earned if student-athletes are academically eligible and one is earned for returning to school the following semester (i.e. retention). All in all, one student-athlete can acquire four APR points during an academic year by being eligible and returning to pursue their education in both semesters (Brown, 2005).

Calculating the team APR is achieved by dividing the team’s total points earned by the total team points possible. This calculation results in a decimal number, which is then multiplied by 1,000 to make the corresponding score easily understood. Therefore a perfect APR score is 1,000. The chosen cutoff score for penalties is currently 925, but will increase to 930 in the coming years (Hosick, 2011b, 2011c). The Committee on Academic Performance (CAP) designated the original cutoff because it equates to roughly a 50% graduation rate. Eligibility and Retention were chosen because they are the two factors that best indicate graduation, which is the primary goal deemed most important by the NCAA (Brown, 2005). Another reason for the 925 cutoff was to provide teams with enough of a cushion so that normal attrition rates could be factored into the equation. Diane Dickman, managing director of membership services for the NCAA noted;

We know that most teams over a four-year period are going to lose points. Things happen in people’s lives – they meet the love of their lives or a parent has a health issue – and they transfer. That’s why we didn’t set the bar at perfection. But if you’re having sustained, regular ‘runoffs’ to the point that half of your roster is just leaving year after year, something’s wrong. (Hamilton, 2005, p. 4)

Penalties are given when teams score below 925 and have one or more student-athletes academically ineligible and not retained. This form of penalty is known as an immediate penalty and can result in up to a 10 percent loss of scholarships each year. In addition to the immediate penalties, teams below 900 face additional penalties that becoming increasingly punitive for each consecutive year a 900 score is not achieved. The first year below 900 earns a public warning letter for poor performance. Two years below a 900 earns restrictions on scholarships and practice time. Year three would trigger a loss of postseason competition for a team (e.g., bowl game in FBS football). Year four and beyond would restrict membership in the NCAA for the institution and eliminate Division I status for the entire athletic department (NCAA, 2010a, 2010b).

Since the implementation of the APR structure, the number of penalized Division I athletic programs has hovered around 2-3 percent per year. This translates to approximately 100-200 of 6,100 Division I athletic teams penalized annually. The sports most likely to be penalized are football and men's basketball, despite having shown marked improvement since the initial set of APR data. The most recent set of data show football teams earned an average APR of 948, while men's basketball earned a 950. These numbers can be compared with the overall mean APR for all sports of 973, as well as the initial set of data from 2004 that resulted in a score of 923 for both sports (NCAA, 2011b; NCAA Research Staff, 2012). The APR scores also

confirm similar data from other academic measures (i.e., graduation rates, GPAs, etc) that has consistently demonstrated Division I football and men's basketball as the two most academically at-risk college sports (Johnson, Wessel, & Pierce, 2010; Johnson et al., in press; NCAA Research Staff, 2011, 2012; Southhall, 2011).

As part of the effort to improve and track APR scores, especially in the sports of football and men's basketball, the NCAA created the Head Coach APR Database. This database houses the single-year team APR for head coaches at each institution during their time as head coach, as well as the average APR in their sport at that institution. The database can be found on the NCAA website and was created as a way to ensure public transparency of APR scores earned under a coach in a specific program (NCAA, 2012a). Jim Isch, interim NCAA President at the time of the database's creation, noted the purpose of the database was to "highlight the critical role they (coaches) play in the development of their student-athletes athletically and academically" (Hosick, 2010, ¶ 4). Walter Harrison, chair for the Committee on Academic Performance (CAP), reinforced the importance of a coaches influence by stating the APR portfolio was necessary because coaches "not only recruit the student-athletes to their institutions but also have the closest relationship with individual student-athletes of any other adult at a college or university" (Hosick, 2010, ¶ 8).

The creation of the Head Coach APR Database, and its subsequent support from the CAP, demonstrates the NCAA's belief in the influence of head coaches on the academic performance of their student-athletes. This concept is critical to the current study because it implies that coaches have a direct impact on APR scores, thus supporting CAS theory. Therefore, given the potential impact of a coaching change on team APR scores at the FBS level, as well as the potential impact on academic philosophy, it is reasonable to conclude a relationship exists between these variables.

If a change in head coach does impact APR scores, CAS theory suggests intervening variables surrounding a coaching change might determine the impact due to the complex interconnectedness of the system as a whole. For example negative coaching changes (e.g., firing, forced resignation) often occur after a pattern of unacceptable performance, usually connected to poor athletic performance (Fee et al., 2006). In these cases, teams have usually suffered several years of losing, thus forcing change. Other negative circumstances might include gross violations of NCAA rules, or legal issues caused by the head coach. Assuming most coach change decisions are the result of team athletic performance, winning percentage appears to be connected with, and a logical predictor of, coaching change (Johnson, Wessel, & Pierce, 2012). Similarly, circumstances of a coaching change are likely a reflection of performance and culture for a specific team, both of which are part of the overall complex system. If, for example, a coaching change is negative (e.g., fired, forced resignation, etc.), it is logical to conclude team morale may already be low due to a lack of team success or poor communication within the system. If, however, the coaching change is positive, there is likely a history of athletic success and a potentially higher level of morale (Voight & Callaghan, 2006). Furthermore, if there is a pattern of success (athletically or academically), and a new coach has been hired from within the current staff, there is likely to be a sustained culture leading to a continued level of trust, which ultimately would serve to disrupt the complex system less than a complete coaching staff change (Roach & Dixon, 2006).

CAS theory suggests these variations in a coaching change would have differing impacts on the entire complex system in which coaches and student-athletes operate. Changing leadership in such a system could alter the attitude and behavior of current student-athletes or

new coaches, thus impacting the academic metrics used to assess the performance of student-athletes. This potential connection has never been explored. Therefore, the current research attempted to determine if a change in leadership at the FBS level would disrupt the complex system enough to impact the academic outcome of the student-athletes within that system by using APR as the dependent variable.

## Method

The current study was preceded by a pilot study to determine if there was a general relationship between a football coaching change and APR scores at a single FBS institution during a five-year period (Johnson, 2012). To establish if such a relationship existed, a two-way (5 x 2) contingency table analysis was conducted. The two variables were APR scores with five levels (years 2005-2010) and coaching change with two levels (change and no change). Within the sample 17.6% of students experienced a coaching change, while 82.4% did not experience a change. APR and coaching change were found to be significantly related,  $\chi^2(4, N = 170) = 170$ ,  $p < .01$ . These results indicated that a change in APR, specifically a lower APR, was the outcome of a head football coaching change at a single FBS institution during a five year period (Johnson, 2012). The results of the pilot study, although significant, were limited by its ability to generalize findings across all FBS institutions. Additionally, the pilot study did not examine any potential intervening variables that accompany a coaching change.

### *Purpose*

The current study sought to expand on the pilot study by investigating all FBS football head coaching changes (N = 160) and the corresponding APR scores during the academic years of 2003-04 to 2010-11 (8 years) amidst a variety of potential intervening variables (e.g., type change, type of hire, winning percentage). The academic year of 2003-04 was selected as the starting point of this study because APR data was first collected during this academic year. The 2010-11 academic year is the most recent with available APR scores.

### *Research Questions / Hypotheses*

The following three research questions and five corresponding hypotheses were formulated as the basis for this study:

RQ 1: *Does a FBS football head coaching change impact APR scores?* This question arises a result Johnson's research (2012) that found a coaching change did impact APR at a single institution. Additionally, this question would serve to support or refute CAS theory by determining if a link between leadership and subordinate behavior existed within the system while examining nature and type of coaching change.

H1: The APR score in the year of a head coaching change will be significantly lower than the average APR score.

H2: Teams with a positive coaching change will demonstrate significantly higher APR scores than a negative coaching change.

H3: A coaching change that results in an internal hire will have APR scores significantly higher than a coaching change that results in an external hire.

RQ 2: *Does a FBS football team's athletic success relate to APR scores?* This question was derived due to previous findings that reveal the winningest Division I football and basketball teams produce some of the lowest academic outcomes of any NCAA sports, thus indicating athletic priorities may supersede academic priorities for many FBS football programs.

H4: Teams with the highest winning percentages (year of coaching change and overall) will produce significantly lower APR scores than teams with the lowest winning percentages.

RQ 3: *What factors predict APR scores for a FBS football team in the year of a coaching change?* This question was meant to discern which variables investigated in this study are the most powerful for predicting APR scores.

H5: All variables (i.e., APR average, type of hire, nature of change, year of change, winning % in year of change, and winning % average) under investigation will be significant predictors of APR scores in the year of a coaching change.

### *Operational Definitions*

Working definitions of each variable were critical to the data collection process. *APR (year of coaching change)* was defined as the single-year APR score earned during the academic year in which a head coaching change occurred. *APR (average)* was defined as the average APR score for the eight academic years under investigation (2003-04 - 2010-11) minus the APR score for the year in which a head coaching change occurred. *Internal/External* identified from where a new coach was hired after the head coaching change. Internal hires were coaches already on the coaching staff that were promoted to head coach (not interim status). External hires were from outside of the exiting coach's staff. *Positive/Negative* identified the circumstances by which the coaching change occurred. Positive coaching changes occurred as a result of successful coaching tenures (e.g., leaving for a more prominent coaching position after success, retired voluntarily with a history of success, or was promoted to athletic director as a result of past accomplishments). Negative coaching changes occurred as a result of unsuccessful coaching tenures (e.g., being fired, resigning after a lack of success, death, scandal, or other negative circumstances where resignation or termination occurred). *Year of Change* was defined as the academic year in which the head coaching change occurred (July 1 - June 30). *Month of Change* was defined as the month in which the head coaching change occurred. *Win % (year of coaching change)* indicated the total number of wins divided by the total games played during the academic year in which the head coaching change occurred. Finally, *Win % (average)* was defined as the total number of wins divided by the total games played during the academic years under investigation (2003-04 - 2010-11).



## Procedures

All FBS football coaching changes ( $N = 160$ ) were determined by reviewing the NCAA Division I Head Coach APR Portfolio (NCAA, 2012a). This online portfolio contains the APR scores for head coaches at NCAA Division I institutions, as well as the years a coach was employed by an institution. If more than one coaching change occurred during the eight-year period under investigation, each coaching change was designated as its own unique occurrence. Football APR data from the academic years of 2003-04 to 2010-11 was extracted from the Head Coach APR Portfolio taking into account the years where a coaching change occurred. Information about conference affiliation, internal/external hires, month of change, and winning percentages were found on institutional websites. Information to determine positive or negative coaching changes was extracted using institutional websites and online media sources documenting the coaching change. Although some subjectivity was used in this determination, the circumstances surrounding the changes in FBS football coaches are largely manifest content, thus making positive or negative determination relatively straightforward.

## Data Analysis

Statistically, descriptive analysis using frequency totals, measures of central tendency, and Pearson correlations were first conducted to organize the data and identify patterns. After descriptive analysis, hypothesis one was tested using a paired samples t-test. Hypotheses two and three were tested using independent t-tests. Hypothesis four was evaluated using two one-way analyses of variances (ANOVAs) to compare the top, middle, and bottom groups based on single year and average winning percentage. The final hypothesis was tested by ordinary least squares multiple regression analysis. Alpha levels were set at .05.

## Results

Before each hypothesis was tested, descriptive statistics were computed. Table 1 demonstrates descriptive information for APR scores (year of change and average score), type of hire (internal vs. external), nature of change (positive vs. negative), and winning percentage (year of change and average). Noteworthy information from Table 1 includes the large amount of external hires (80.62%) compared to internal hires (19.38%), and more than double the amount of negative coaching changes ( $n = 110$ ) than positive coaching changes ( $n = 50$ ). Table 2 displays the timing (month and year) of FBS football head coaching changes cross tabulated with type of hire (internal vs. external) and nature of change (positive vs. negative). The number of coaching changes in a given academic year ranged from 10 (2005-06) to 25 (2010-11), with the most changes (69.4%) occurring in the months of November and December combined. Table 3 presents variables associated with FBS football head coach changes by conference. The total head coaching changes from 2003-2011 ranged from 7 (Independent) to 26 (Mid-American Conference). The APR during the year of a coaching change varied from a low of 912.33 (Western Athletic Conference) to a high of 966.23 (Atlantic Coast). Table 4 demonstrates Pearson correlation coefficients for the variables investigated in this study. The strongest correlations were found between winning percentage in the year of a coaching change and average winning percentage ( $r = .74, p < .01$ ), indicating the number of wins in the year of a coaching change barely deviate from wins in years where coaches remain intact. Additionally,

APR in the year of a coaching change was significantly correlated to five of the six variables investigated.

Table 1 - *Descriptive Information for Variables Associated with Head Coaching Change*

Variable	<i>n</i>	%	<i>M</i>	<i>SD</i>
APR (year of coaching change)	160	100	938.42	32.81
APR (average)	160	100	943.78	18.09
Internal Hire	31	19.38		
External Hire	129	80.62		
Positive Coach Change	50	31.3		
Negative Coach Change	110	68.8		
Win % (year of coaching change)			.43	.23
Win % (average)			.49	.18

Table 2 - *Timing of FBS Head Coach Changes Cross Tabulated with Type of Hire and Nature of Change*

	<i>n</i>	%	Positive	Negative	Internal	External
Year						
2003-04	14	8.8	2	12	2	12
2004-05	23	14.4	7	16	4	19
2005-06	10	6.3	1	9	2	8
2006-07	24	15	9	15	5	19
2007-08	19	11.9	7	12	4	15
2008-09	22	13.8	4	18	6	16
2009-10	23	14.4	11	12	2	21
2010-2011	25	15.6	9	14	6	19
Month						
January	21	13.1	12	9	7	14
February	9	5.6	5	4	3	6
March	2	1.3	1	1	1	1
April	0	0	0	0	0	0
May	1	.6	0	1	1	0
June	2	1.3	0	2	0	2
July	9	5.6	2	7	4	5
August	1	.6	0	1	0	1
September	0	0	0	0	0	0
October	4	.3	0	4	2	2
November	33	20.6	6	27	0	33
December	78	48.8	24	54	13	65

Table 3 - Variables Associated with FBS Football Head Coach Change by Conference

FBS Conference	Head Coaching Change Total (2003-2011)	APR (year of coaching change)	APR (average 2003-2011)	Positive	Negative	Internal	External	Win % (year of coaching change)	Win % (average 2003-2011)
Atlantic Coast	13	966.23	962.19	2	11	5	8	.45	.54
Big 12	8	929.13	940.41	2	6	2	6	.43	.46
Big East	13	937.38	943.55	5	8	1	12	.62	.58
Big Ten	14	954.07	948.69	2	12	4	10	.49	.52
Conference USA	16	924.44	945.18	6	10	1	15	.40	.49
Independent	7	959.00	964.27	2	5	3	4	.38	.42
Mid American	26	932.42	935.46	10	16	3	23	.44	.43
Mountain West	10	947.20	936.74	6	4	3	7	.38	.48
Pacific 12	14	951.86	949.61	4	10	4	10	.49	.52
Southeastern	16	933.31	951.56	7	9	2	14	.44	.51
Sun Belt	8	930.88	929.88	0	8	1	7	.23	.36
Western Athletic	15	912.33	927.00	4	11	2	13	.32	.39

Table 4 - Pearson Correlations for FBS Head Coaching Change Variables

	APR (year of coaching change)	APR (average)	Nature of Change (Positive / Negative)	Type of Hire (internal / external)	Year of Change	Win % (year of coaching change)	Win % (average 2003-2011)
APR (year of coaching change)	-						
APR (average)	.50**	-					
Nature of Change (Positive / Negative)	-.11	-.02	-				
Type of Hire (internal / external)	-.29**	-.25**	.25**	-			
Year of Change	.21**	-.07	-.16*	-.06	-		
Win % (year of coaching change)	.25**	.16*	-.41**	-.36**	.22**	-	
Win % (average 2003-2011)	.16*	.19*	-.37**	-.31**	.14	.74**	-

Hypothesis one extended the findings of the APR correlations using a paired-samples t-test to evaluate whether the APR score in the year of a head coaching change was significantly lower than the average APR score at the institution. The results indicated that the mean APR score in the year of a coaching change ( $M = 938.42$ ,  $SD = 32.81$ ) was significantly lower than the average APR score ( $M = 943.78$ ,  $SD = 18.1$ ),  $t(159) = -2.38$ ,  $p = .02$  confirming hypothesis one.

Hypotheses two forecasted that a positive coaching change would demonstrate significantly higher APR scores than a negative coaching change. An independent samples t-test revealed no significant difference between a positive ( $M = 943.88$ ,  $SD = 25.32$ ) and negative ( $M = 935.94$ ,  $SD = 35.52$ ) coaching change,  $t(158) = 1.42$ ,  $p = .16$ , thus refuting the hypothesis. Hypothesis three was also tested using an independent samples t-test to determine if a coaching change that resulted in an internal hire produced APR scores higher than a coaching change that resulted in an external hire. This test was significant,  $t(158) = 3.76$ ,  $p < .01$ , indicating that teams who had new head coaches who were already on the previous coach's staff ( $M = 957.52$ ,  $SD = 25.43$ ) had higher APR scores than teams with new head coaches external to the football program ( $M = 933.83$ ,  $SD = 32.8$ ). The 95% confidence interval for the difference in means ranged from 11.23 to 36.14.

To investigate hypothesis four, two one-way ANOVAs were conducted to determine if teams with the highest winning percentage (year of coaching change and overall) would produce significantly lower APR scores (year of coaching change and average) than teams with the lowest winning percentages. The independent variable, winning percentage, included three levels: lowest third winning percentages, middle third winning percentages, and upper third

winning percentages. The two dependent variables were APR in the year of the coaching change and average APR. The first ANOVA (APR in the year of the coaching change) was significant,  $F(2, 157) = 4.51, p = .01$ . Post hoc Tukey HSD analyses revealed that APR scores for teams with the lowest third winning percentage ( $M = 934.11, SD = 30.74$ ) and middle third winning percentage ( $M = 932.07, SD = 38.86$ ) were not significantly different. The APR scores for the upper third ( $M = 949.19, SD = 25.05$ ), however, were significantly higher than the lower third ( $p = .04$ ) and middle third ( $p = .02$ ) indicating the teams with the upper third winning percentages earned the highest average APR scores in the year of a coaching change, opposite as predicted. The second ANOVA (APR average) was also significant,  $F(2, 157) = 4.55, p = .01$ , and the post hoc results were similar. APR scores for teams with the lowest third winning percentages ( $M = 940.98, SD = 20.33$ ) and middle third winning percentages ( $M = 940.65, SD = 16.09$ ) were not significantly different ( $p = .99$ ), while APR scores in the upper third winning percentages ( $M = 949.78, SD = 16.4$ ) were significantly higher than the bottom third ( $p = .03$ ) and middle third ( $p = .02$ ), again opposite as predicted.

The final hypothesis utilized a least squares multiple regression analysis to evaluate which variables were significant predictors of APR scores in the year of a coaching change. The six predictors were APR average, type of hire (i.e., internal or external), nature of change (i.e., positive or negative), year of coaching change, winning percentage in years of coaching change, and average winning percentage with APR score in the year of a coaching change as the criterion variable. The linear combination of predictors was significantly related to APR in the year of a coaching change  $F(17, 143) = 5.8, p < .01$ . The sample multiple correlation coefficient was .64, indicating that approximately 41.3% of the variance in APR scores in the sample can be accounted for by the linear combination of predictors. Only APR average score and year of coaching change were significant predictors of APR score in the year of a coaching change (see Table 5).

Table 5 - Summary of Least Squares Regression for Variables Predicting APR in the Year of a Coaching Change

Variable	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>t</i>	<i>sig</i>
APR (average)	.80	.15	.45	5.4	<.01**
Type of Hire (internal vs. external)	-5.05	6.23	-.06	-.81	.42
Nature of Change (positive vs. negative)	-3.85	5.38	-.06	-.77	.48
Year of Change	2.54	.96	.81	2.64	<.01**

Win % (year of change)	19.54	12.89	.14	1.51	.13
Win % (average)	-17.27	14.8	-.1	-1.17	.25

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## Discussion

The purpose of this study was to determine if the nature of a head coaching change impacts APR at the FBS level of collegiate football. Descriptive statistics were first evaluated to illustrate the nature of the variables under investigation and yielded many results that are expected in the world of college football. For example, the fact that most new FBS coaches are external hires is expected. As noted by Fee et al. (2006), it is common for entire staffs to be replaced as a result of poor performance. This fact is supported by the finding that there were more than double the amount of negative coaching changes (e.g., fired) as positive changes (e.g., hired to a more prestigious program). Therefore, if most coaches are replaced because of negative circumstances, it is reasonable to assume members of the coaching staff would also be replaced. Additionally, from a timing standpoint, it is not a surprise that 69.4% of coaching changes occur in the months of November and December. These months mark the end of the regular college football season and allow athletic directors the opportunity to make informed decisions about a coach's performance. If a coaching change is to be made, releasing a coach in these months allows time for a thorough search process, as well as time to develop an off-season training schedule after a new coach is hired.

Conference descriptive information revealed that no conference is immune to coaching changes as evidenced by eight of the eleven FBS conferences, as well as independent institutions, having ten or more coaching changes between the 2003-04 to 2010-11 academic years. In every conference, except the Mountain West, more negative coaching changes happened than positive. Similarly, in every conference more external hires were made than internal. These findings suggest that coaching changes are most often the result of unsuccessful athletic achievements, which is supported by the significant correlation between the nature of a coaching change and winning percentage in the year of the coaching change. In other words, negative coaching changes happen more as a team's winning percentage decreases. This is not a surprise as many would expect coaches with losing records to be replaced more often than coaches with winning records. More importantly, these descriptive results support CAS theory and validate investigation of the three research questions proposed in this study.

### *Coaching Change and APR*

The first finding relating coaching change to APR scores indicated that APR scores in the year of a head coaching change were significantly lower than the average APR score during the eight-year time period of 2003-2011. This result confirms hypothesis one, and supports results from Johnson (2012) who found that a coaching change did impact APR at a single institution.

This result also supports CAS theory by establishing a link between leadership and subordinate behavior within the larger system.

The significant result from hypotheses one is also supported by a variety of sources pointing to the potential impact of a head coach on academic outcomes. One explanation may be because head coaches have been identified as one of the most influential people in the lives of college student-athletes (Brubaker, 2007; Giacobbi et al., 2002), with 41% of Division I college football players reportedly selecting their university because of the coach (NCAA, 2011a). Furthermore, coaches are responsible for all aspects of their programs including academic policies and expectations (Leslie-Toogood & Gill, 2008); thus, impacting decisions about team academic norms. These concepts are viewed in conjunction with the large salaries provided to FBS head coaches that are often highlighted in the media and presumed to represent a coach's value (Sander, 2011). Lastly, the basic premise from which the NCAA head coach APR database was created rests on the assumption that coaches impact APR scores. The results supporting hypothesis one indicate this assumption should be supported, at least for the impact in a single year when a coaching change occurs.

Knowing that APR scores are generally impacted by a coaching change is important to grow the body of APR literature. From a practical perspective, the difference in five points between mean APR scores in the year of a coaching change and the average APR scores could lead to harsh penalties for some programs, especially for Division I football who already have the lowest average APR scores of any sport (NCAA Research Staff, 2012). Moreover, when one considers the lowest average Division I sport APR is 948 (football), and the highest is 990 (women's field hockey), it becomes easy to discern how five points could make an impact in the relatively small range of scores (NCAA Research Staff, 2012). Besides penalties, results from hypothesis one also allows administrators to make more informed decisions about head coaching changes and student-athlete well-being. Specifically, athletic directors considering a head coaching change can utilize these results to better understand the potential impact of a coaching change on APR scores and program health. More specifically, athletic directors and student affairs personnel can expect lower APR scores for the year a head coaching change occurs, and thus can take measures to increase intervention and programming strategies to reduce the potential loss of APR points.

A second finding for coaching change and APR scores indicated no significant differences between a positive or negative coaching change, which did not support hypothesis two. These predictions were made based on CAS theory which emphasizes the quality of interaction between parts of a system influences the system as a whole. In other words, it was predicted that coaches who leave their position for positive reasons would have a more positive environment associated with their program than coaches who leave for negative reasons. The lack of significance, which appears odd given a seven-point difference between mean APR scores is larger than the five-point difference found in hypothesis one, is due to the differences in t-tests. For hypothesis one, the dependent t-test controlled for individual variations which produced a more statistically sensitive measure because of the reduced error term as compared to the independent t-test used for hypothesis two. The result of hypothesis two is important because it reveals that the nature of a coaching change is not as important as the fact there was a change in general. In other words, whether the coach was fired or hired to a more prestigious position at another university, does not matter. What matters appears to be that the coach is leaving.

To explain this finding, one must consider a few situational factors. First, FBS student-athletes cannot easily follow a coach to another school due to the NCAA transfer rules that



require student-athletes sit out a year of competition when moving to a similar school (NCAA, 2012b). Although some football student-athletes choose to transfer, many student-athletes likely find the penalty of sitting out for an entire year too steep. Therefore, the APR retention points that would be lost if students followed their coach, are preserved. This restriction would apply whether the coach left on positive or negative terms, and might serve to neutralize some potentially lost retention points for students who might transfer out of loyalty to their coach, thus reducing the differences one might observe through a positive or negative change. Second, it is important to acknowledge that APR scores are calculated based only on eligibility and retention and not on team GPA (although GPA does partially factor into the eligibility component). Therefore, it is possible that academic performance (i.e., team GPA) could be influenced based on a positive or negative change, but eligibility and retention levels stay the same, thus not impacting APR scores. Third, the academic culture set by coaches at FBS institutions are often supplemented by academic advising or support departments that operate in conjunction with all athletic teams. These departments are largely responsible for oversight of tutor coordination, advising, study hall, and other support services (Leslie-Toogood & Gill, 2008). Although a head coaching change in general appears to have an impact large enough to counteract some of the work done by these departments, enough of an influence may exist to neutralize any differences between a positive and negative coaching change. Fourth, the operational definition of positive and negative coaching changes in this study allowed the researchers to make interpretations about what is positive and negative based on the manifest content of a variety of media or institutional sources, and assumes a link between the cause of a coaching change and team environment. Although most coaching changes appear to be linked to wins and losses, as evidenced by the significant correlation between winning percentage and nature of change, there are other potential influences at work that may cause a coaching change. What appears to be a positive environment due to team athletic success may not translate into the day-to-day academic motivation of a team. In other words, teams can be winning on the field but be operating in a negative academic environment. Certainly, the public and media are not afforded access to all the reasons a coach might be released or seek another position, and some coaching changes are likely more complex than they first appear. Understanding the nature of the academic environment from the student-athlete perspective could be a focus of future research, and is reasonable within the context of CAS theory.

The third finding indicated a significantly higher APR score for internally hired coaches, thus supporting hypothesis three. This finding is critical because it suggests that although there is not a difference between a positive and negative coaching change, there is a significant difference in APR scores when an assistant coach was promoted from the previous coaching staff to the head coach position. Furthermore, despite the insignificant difference between the nature of a coaching change and APR scores, there was a significant positive correlation between nature of change and type of hire indicating that an internal hire occurs most often when the coaching change happened under positive conditions. In fact, 34% of hires were internal following a positive coaching change, while only 1.3% of hires were internal following a negative coaching change. These findings are supported by evidence from Fee et al. (2006) who revealed internal hires are most often made when a team is successful. Additionally, these discoveries support contentions from Roach and Dixon (2006) who found the advantages of hiring internally include a reliable assessment of fit, quick time for socialization and value contribution, and already established trust between all parties.

These concepts help explain why hypothesis three was significant and hypotheses two was not. For example, if there is already a culture of academic expectations provided by academic support services or advising (Leslie-Toogood & Gill, 2008), a positive or negative coaching change may not significantly influence APR. If, however, the established academic culture is combined with a sustained coaching influence as a result of an internal hire, there could be a collective effect that positively impacts APR. Roach and Dixon (2006) highlight the potential importance of such a sustained coaching relationship by noting "in the highly interpersonal context of coaching, the ability to build trust and relationships might be even more important than specific job functions" (p. 147). This contention is also supported by CAS theory because it emphasizes the importance of a specific relationship within the larger complex system (Eidelson, 1997). Based on the results of this study one cannot be sure if a combined effect is the cause of improved APR scores. Nonetheless, it is certain that APR scores are higher in cases where a coach is hired internally rather than externally. Pragmatically, athletic administrators can use this information to help make informed human resource decisions.

### *Winning % and APR*

Research question two examined if a FBS football team's athletic success related to APR scores. In general, winning percentage was related to APR scores, thus supporting hypothesis four. This hypothesis was predicated on a number of previous findings that reveal the winningest Division I football and basketball teams, particularly teams that regularly reach televised postseason competition, produce some of the lowest GPA and graduation rates of any NCAA sport (Amato, Gandar, Tucker, & Zuber, 1996; Christianson, 2004; Hosick, 2009; Institute for Diversity and Ethics in Sport, 2012a, 2012b; Shapiro, 1984). Additionally, findings from the Johnson (2012) pilot study suggested that at an individual institution winning percentage was a significant predictor of APR scores. Given these sources, it was not surprising to find that average winning percentage had a significant relationship with average APR scores during 2003-2011 and APR scores in the year of a coaching change. However, it was surprising to find the top third most successful teams (i.e., highest winning percentages) had significantly higher APR scores than teams with lower winning percentages. The fact that the winningest teams had the highest APR scores was opposite of the predicted outcome which presumed the winningest teams would have the lowest APR scores.

One likely explanation for this finding is that the sample from the current study investigated only teams that experienced a coaching change between the 2003-04 and 2010-11 academic years. There were 13 traditionally successful FBS programs that did not experience a coaching change during the eight-year time frame of this study, and thus were not included in the analysis. Therefore, it is likely the literature which indicates the winningest revenue sports teams perform relatively poor academically (Amato et al., 1996; Christianson, 2004; Hosick, 2009, 2011a; Institute for Diversity and Ethics in Sport, 2012a, 2012b; Shapiro, 1984) is accurate because it includes traditionally successful programs that have not experienced a coaching change, or examined only programs that have reached the highest level of post-season competition (e.g., bowl games, NCAA Division I basketball tournament, etc.). Moreover, it may be reasonable to assume that the programs under investigation in this study are ones that experienced some lack of success between 2003-2011, but persevered to also experience some successful athletic seasons. Perhaps it is this non-traditional amount of athletic success that contributes to an overall positive team atmosphere, thus influencing APR scores. Put another

way, programs that are not traditionally the most athletically successful in college football, which are most likely to experience a coaching change, may be positively influenced more by an occasionally successful season.

For the programs included in this study which are large and regularly successful, but have also experienced a coaching change, there are likely to be a tremendous amount of financial and academic resources in place. Therefore, the most wealthy and supported programs at the highest BCS levels may have a built-in cushion to resist the impacts of a coaching change more so than smaller Division I institutions with limited resources. This would make sense under CAS theory because the more support that is available, the more access student-athletes would have to such support, thus improving the relationships between student and support personnel. Additionally, there is evidence to suggest that student-athletes on a winning team are likely to enjoy their experience, which means they are probably less likely to leave the team or university, thus securing the retention points associated with the APR (Voight & Callaghan, 2006). Conversely, playing for unsuccessful teams may be less enticing to some student-athletes, which may compel them to leave their university (Voight & Callaghan, 2006). Future research would benefit from identifying the nature of retention via successful vs. unsuccessful athletic teams, and the corresponding impact on APR scores.

### *Predicting APR During a Coaching Change*

Only APR average and year of coaching change were powerful enough to significantly aid in predicting APR scores in the year of a coaching change. Examining more closely the two significant predictor variables reveals important insight on how a coaching change might influence APR. For example the *B* value of .8 for APR average indicates that if all other variables were held constant, the APR in the year of a coaching change increases .8 for every one point increase of the school's typical APR value. Put another way, APR scores for the year of a coaching change would be approximately 80% of what the APR scores would be typically, assuming all other variables remain constant. This finding reveals that although APR scores are significantly lower in the year of a coaching change, they are still somewhat tied to the average APR scores of the institution. This conclusion is important because it demonstrates that for FBS football, the impact of a head coach is important, but may also be influenced by other institutional factors that keep APR scores relatively consistent (e.g., academic advising, institutional policy). Framed within CAS theory, there is evidence to suggest a strong relationship between coach and player, but the multitude of other interconnected relationships also appear to influence academic outcomes.

The importance of the other significant predictor (i.e., year of coaching change) is also a key finding of this study. A *B* value of 2.54 for the year of change indicates that for every year farther from 2003-04, the APR score in the year of a coaching change would be 2.54 points higher, which supports evidence that APR scores have trended upward since the initial set of scores were released (NCAA 2011b; NCAA Research Staff, 2012). Although the results of this study cannot confirm it, other sources have indicated that institutions have discovered ways to adapt to the APR metric with improved programming and advising that may serve to focus more on preserving eligibility and less on a quality education (Grasgreen, 2012). This adaptation process was predicted in the early stages of the APR when Lombardi (2005) wrote; "Some institutions, more interested in the competition than the student, will likely find ways to evade much of this legislation through soft courses and majors, overly zealous academic advising and

similar maneuvers" (§ 11). Additionally, the APR metric may have changed the ways coaches recruit and structure their academic guidelines. Whatever the case, the impact of a coaching change appears to influence APR scores less over time.

### *Limitations/Suggestions*

Despite the important findings of this study, there were some limitations and subsequent suggestions for improvement. First, the current study investigated only FBS football head coaching changes. This population is unique because it is the largest and most commercialized form of college football. Head coaches at this level are oftentimes celebrities that have a multitude of additional media responsibilities beyond what coaches in less commercialized sports might experience. Future research could focus on coaching changes at the FCS level, or coaching changes in other sports. For example, in a sport such as Division I basketball, the impact of a coaching change may be more pronounced due to the small number of players on a team and the potential for more interaction with a head coach. Furthermore, investigating the potentially different impact between head coaches and assistant/position coaches would be recommended.

Second, this study investigated a limited number of variables associated with head coaching changes. There are a variety of other potential variables that could be considered in conjunction with a coaching change. For example, investigating GPA, subjective views of athletic success, coaching salaries, academic support resources, and the nature of retention based on athletic success may provide more in depth understanding of coaching change influence, or a lack thereof. Finally, the variable identified as positive/negative (nature of change) was reliant on the researcher's interpretation of the change. Although most situations appeared to be manifest content, there are likely circumstances that are not made public but that contributed to coaching changes. Future research would benefit from assessing the motivational climate and individual perceptions of student-athletes on teams where such coaching changes occur.

## **Conclusion**

Using CAS theory as a foundation, the current research predicted that a change in head coach would impact APR scores of FBS football student-athletes. Results indicated that APR scores are lower during years of a head coaching change, higher when a coach is promoted internally, highest for the most athletically successful teams, and predicted by average APR score and year of coaching change. These key findings provide support that a head coach is a primary influence on the academic behaviors of student-athletes, and that variables within the complex structure of FBS collegiate football work in conjunction with one another to provide a combined impact on APR scores. Pragmatically, administrators, interim coaches, and support personnel can use this information to aid student-athletes during a time of coaching transition, or make informed human resource decisions.

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