

**Differences in the Success of NFL Coaches by Race, 1990-2002:
Evidence of Last Hire, First Fire***

by

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Abstract

While there have been numerous analyses of racial discrimination in professional sports, few have concentrated on football. None has analyzed coaching. Analyses of the regular season win records, and of making the playoffs, for National Football League (NFL) teams coached by both African Americans and whites between 1990 and 2002 show that African American coaches were more successful. The analyses make racial comparisons for overall season records, records in the first year, and records in the year of an involuntary departure for the coach. There is evidence that teams that hire African American coaches are better than those that hire white coaches. Three analyses that consider team quality effects (two by examining wins and playoffs after controlling for the record of the team in the previous year under a different coach and after controlling for the ratio of team to league salaries, and another by examining records by race of coach only for teams that have hired African American coaches) also find significantly better performance by African Americans. African American coaches have been insignificantly less successful in the playoffs, however. Overall, the results are consistent with African American coaches being held to higher standards in order to get their jobs in the NFL.

There are relatively few African American coaches in the National Football League (NFL). Between the 1990¹ and the 2002 seasons, 77 whites, and only 5 African Americans, coached an NFL team for at least a full season. African Americans account for a little more than 6% of coaches between 1990 and 2002 and only 2 of the 32 head coaches in 2002, a percentage that is less than half their share of the U.S. population (which was 12.8% in 2000),² but that is a far smaller share of their percentage of participants in professional football. For example, Northeastern University's Center for the Study of Sport in Society *2001 Racial and Gender Report Card* indicates that 28% of NFL assistant coaches and 67% of NFL players are African American. Staudohar (1989) reports that 56% of NFL players were African American in 1988.

Why are the numbers of African American NFL head coaches so small? African Americans may be underrepresented in the “pipeline” (the particular set of jobs that NFL head coaches usually have preceding their appointments as coaches). The pipeline may not be the only explanation, however, for the underrepresentation of African Americans among NFL coaches. African Americans may also be underrepresented because, when in the pipeline, they must also meet higher standards than whites in order to be selected as head coaches. In this study, I examine whether NFL teams effectively “require” that African Americans be better than whites in order to be appointed as a coach and to continue coaching once appointed.

For participants in professional sports, unlike most other jobs, there is an objective record of performance. Many studies have utilized data on individual player performance to evaluate performance by race relative to pay and other conditions of employment. (See Kahn (1991) Table 1 for a listing of several studies.) No study has examined racial differences in appointments to coaching positions, considering performance. Coaches are responsible for making entire teams successful, and their success can be readily measured in terms of win-loss records and advancement to the playoffs. If race does not affect which of the potential coaches in the pipeline

are selected to be an NFL head coach, then there should be no difference by race in the win-loss or playoff records of African American coaches and white coaches. We can tell whether NFL teams “require” that African American coaches be better than white coaches in order to obtain and to keep their positions, then, by comparing the win-loss and playoff records of white and African American coaches.³

Past Research on Race and Professional Football

There is a large research literature analyzing whether there is evidence of racial discrimination in sports, especially in professional sports. Kahn (1991) provides an excellent summary of this research. Most of this research involves analyses of compensation for professional baseball and basketball players by race.

Only a handful of studies (Gius and Johnson, 2000; Kahn, 1992; Mogull, 1973 and 1981; Scully 1973) have examined professional football.⁴ The studies have primarily examined racial differences in player compensation; one study has examined racial differences in positions played and performance in positions. There is little evidence of racial discrimination in salaries among NFL players, to the extent that performance or productivity is accurately measured. Mogull (1973) found very small salary differentials (1 to 4 percent) in favor of white players in 1970 based on a small sample of 96 players. Kahn (1992) found African American players earned about four percent less than white players in 1989, using a sample of 1,363 players. Gius and Johnson (2000) found a positive salary differential (10 percent with a t-statistic of 1.87) in favor of African American players in 1995 based on a sample of 938 players. Both the Kahn and the Gius-Johnson studies estimate the racial difference controlling for position, draft round, number of games started, and years played. Kahn also controls for education, whether in pro bowl, and injury status. Kahn also analyzes racial salary differences separately for defensive, offensive and running backs-

receiver positions controlling for the available statistics on performance and finds no significant difference.

Scully (1973) examined racial differences in the performance of African American and white NFL players in 1971. Similar to the strategy used in my study of coaching outcomes, Scully argued that, if African American players are performing better than white players, there must be barriers to entry for African American players. He found that, in 1971, African Americans were over represented as defensive backs, running backs, and wide receivers and underrepresented as quarterbacks, kicking specialists, centers, guards, and linebackers. The performance data for African Americans and whites in running back and wide receiver positions in 1971 (the only positions with performance data and reasonable representation of both races) favored African Americans in all instances.

There have been a few studies that have examined racial disparities in appointment to coaching positions. Scully (1989, pp. 179-181) examined racial disparities in appointment to baseball manager positions by examining the region of birth and experience backgrounds of baseball managers. He finds that most managers were not from the South and played infield positions while African American baseball players were from the South and less likely to have played infield positions. Shropshire (1996, p.79) quotes a *USA Today* analysis showing that the first three African Americans hired as managers in baseball had better records with their teams than did the whites that followed them (winning percentages of .472 versus .430). There has been no study that has examined racial disparities in performance, or in appointment to, head coaching positions in the NFL.

Data and Approach

The Washington D.C. law firm of Mehri & Skalet PLLC compiled a database that included the win-loss records, and whether the team made the playoffs, for every NFL team and coach between 1986 and 2001. I supplemented these data with the 2002 performance records and with salary data from 1986-2001.⁵ I used these data to compute the regular season win-loss records and whether the team was in the playoffs, for each year for all coaches, by race, who were in their jobs for a full season. I examined the overall records, the first season record, and the final season record for coaches who leave involuntarily. I examined whether race affects the likelihood of being fired after controlling for the team's regular season record and the time the coach has been with the team. I examined the playoff records. I also examined the records for white coaches and for African American coaches in their first year of coaching, controlling for the team's prior season record under another coach; I examine the overall records controlling for the team's payroll relative to league averages. Finally, I compare the records of the African American and the white coaches of the teams who have had African American coaches.

In all but one of these comparisons, African American coaches have a stronger record than white coaches. The regular season wins and the playoff advantages of African American coaches occur at all stages of their coaching careers. African American coaches perform better in their initial season and they are still performing better in their last season with the team, when they are forced to leave their jobs. The win and playoff advantage of African Americans occurs when controls for team quality are considered. These results are consistent with NFL teams "requiring" that African American coaches be better than whites in order to obtain and to keep their positions. Although all five of the African American coaches in the NFL have made the playoffs, while less than two-thirds of white coaches have, African American coaches have a lower playoff win

percentage than the selection of white coaches who made the playoffs. I explain and illustrate each of these comparisons below.

Overall Season Records

Based on the 29 full seasons coached by 5 African American coaches and the 346 full seasons coached by 77 white coaches between 1990 and 2002, African American coaches averaged 9.1 wins and white coaches averaged 8 wins, a statistically significant racial difference of 1.1 wins. These win records by race are listed in Table 1.

The racial difference in wins is particularly important in a league that is balanced in strength. For example, during this time period over sixty percent of teams with exactly nine wins made the playoffs, but less than nine percent of those with eight wins did so. Because African

Table 1			
Average Season Wins, Losses, and Other Characteristics of Full Season NFL Coaches by Race, 1990-2002			
	African American Coaches (29 full season observations)	White Coaches (346 full season observations)	t-statistic for difference by race*
Average wins per year	9.1	8.0	2.56
Proportion in playoffs	69%	40%	3.48

* The t-statistics for this table and for those that follow reflect the t-statistic, computed with robust standard errors, for the coefficient of race in a regression of wins (or probability of making the playoffs with a logistic specification) on race, clustering the multiple observations on the same individual coach.

American coaches had more wins, it is not surprising that there is a substantial racial gap in the probability of making the playoffs. Sixty-nine percent of the teams coached by African American coaches made the playoffs, but only forty percent of those with white coaches did. These statistically significant differences in playoff records by race are listed in Table 1.

In order to assess the statistical difference in these records, I regress number of wins and whether a team is in the playoffs on race of coach (using a logit specification), computing the

standard errors by clustering the records of each coach who appears in the data set for multiple years. The t-statistics reported on Table 1 and in subsequent tables for the differences by race in wins or playoff records are the t-statistics for the coefficients on race in these regressions.

All of the African American coaches have made it to the playoffs, but only 29 of the 77 white coaches made it to the playoffs between 1990 and 2002. African American coaches who have made it to the playoffs, however, have not been as successful there as white coaches who have made it to the playoffs. African American coaches have losing records in the playoffs (an aggregate of 10 wins and 20 losses) while white coaches have winning records (an aggregate of 133 wins and 124 losses).⁶ Of course, almost all playoff teams fail to achieve winning records in the playoffs unless they make it to the Super Bowl and none of the five African American coaches has made it to the Super Bowl.

It is more difficult to quantify success in the playoffs than in the regular season (for coaches who do not make the Super Bowl). Unlike the regular season, in which all teams play the same number of games so that total wins unambiguously reflect success, coaches with more playoff losses *ceteris paribus* have been in the playoffs more than coaches with fewer losses. Coaches who have no losses (other than Dick Vermeil whose one season in the playoffs within the database reflects a Super Bowl win with no playoff losses) are the least successful because they have never made the playoffs.

One approach, which is complicated by the small number of full seasons for African American coaches, is to measure the effect of race on the number of post-season wins controlling for the effects of the selection of stronger teams (coaches) into the playoff rounds. Based on a Heckman two-stage selection model as described in Table 2, African American coaches average 0.4 fewer playoff wins than white coaches with a t-statistic of -2.04 or a probability of 0.046 that the weaker performance for African American coaches arises from random variation.

Table 2				
Heckman Selection Model of Playoff Wins by Race, 1990-2002				
	Playoff wins		Probability of Making Playoffs	
Independent variables	coefficient	t-statistic	coefficient	t-statistic
African American	-0.406	-2.04		
Mill's Ratio	-0.829	-4.57		
Regular Season Wins			1.536	7.73
Constant	1.126	12.40	-13.58	-7.70

A simpler approach is to compute the playoff win and loss records for African American and white coaches, given their regular season win records. Table 3 shows that African American coaches had a slightly lower win percentage in the playoffs than whites with similar regular season win records.

Table 3		
Playoff Win-Loss Records by Regular Season Records and Race, 1990-2002		
	Play off Records	
	(Numbers in parentheses are proportion of wins)	
Regular Season Wins	African American Coaches	White Coaches
9	2-6 (.25)	12-25 (.32)
10	4-9 (.31)	16-28 (.36)
11	2-3 (.40)	34-33 (.51)
12+	2-2 (.50)	71-34 (.68)

While it is easy to understand that an individual coach performs well in the regular season but cannot deliver in the playoffs, and many such coaches come to mind, it is more difficult to explain why African American coaches would be systematically more like than white coaches to possess this characteristic. I find this result puzzling. The result is not statistically significant and might well be an artifact of the small number of African American coaches in the study.

Records for First Seasons of Coaching

The regular season win advantage of African American coaches is even greater for their first full season on the job. Based on the first full seasons coached by 7 African American coaches

and by 84 white coaches,⁷ African American coaches averaged 9.6 wins versus an average of only 7.1 wins for white coaches in their first year, a statistically significant racial difference of 2.5 wins. These win records for the first year of coaching, by race of coach, are listed in Table 4.

Seventy-one percent of first year African American coaches made the playoffs, but only 23 percent of white coaches did. The racial difference in playoff records is also statistically significant.

Table 4			
Average Season Wins, Losses, and Playoffs in First Season for Full Season NFL Coaches by Race, 1990-2002			
	African-American Coaches (7 full season observations)	White Coaches (84 full season observations)	t-statistic for difference by race
Average wins per year	9.6	7.1	3.61
Proportion in playoffs	71%	23%	3.48

Records for Seasons of Forced Departure

African American coaches who were forced to leave their jobs also were winning more games than white coaches when they were forced to leave, although the differences by race are not statistically significant. The 5 African American coaches who were forced to leave after completing a full season with their teams, between 1990 and 2002, had an average of 6.8 wins while the 55 white coaches in a similar situation had 5.6 wins, a racial difference of 1.2 wins. These win records for the (involuntarily) final year of coaching, by race of coach, are listed in Table 5.

Twenty percent of these African American coaches made the playoffs in the season that they were terminated, but only seven percent of white coaches did. These playoff records for final year coaches, by race of coach, are listed in Table 5.

Table 5			
Average Season Wins, Losses, and Playoffs in Last Full Season NFL Coaches with Involuntary Departure, by Race, 1990-2002			
	African American Coaches (5 full season observations)	White Coaches (68 full season observations)	t-statistic for difference by race
Average wins per year	6.8	5.6	1.27
Proportion in playoffs	20%	9%	0.72

The lack of statistical significance in regular season records at time of involuntary departure coupled with the statistically insignificant inferior performance in the playoffs of African American coaches, discussed above, are consistent with no racial disparities in the quality of head coaches who are fired in the NFL.

Because I have data on the performance of all of the coaches who could be fired in a year,⁸ the data permit a more direct test of whether African American coaches are more likely to be fired, conditional on performance.⁹ I regress the probability of being fired on the regular season win record, whether the team made the playoffs, the total years the coach is head coach for the team, and race. The results appear on Table 6. As expected, coaches are more likely to be fired if they win less and if they have had more years with the team. African American coaches are significantly more likely to be fired than white coaches, controlling for their regular season performance and their time with their teams. When I conduct a similar regression analysis including only the 20 African American and 137 white full season coaches who made the playoffs, I find African Americans to be insignificantly less likely to be fired given their playoff win record. I also note that the variable “regular season wins” becomes insignificant and that “total years with team” becomes less significant. Restricting the number of observations to coaches who made the playoffs (only six of whom were fired), makes the statistical analysis substantially less powerful.

Table 6
Determinants of Being Fired, Full Season NFL Head Coaches, 1990-2002
Logit Regression with “Whether Fired” as Dependent Variable

	Model including all 375 full seasons for coaches		Model including only the 157 full seasons for coaches that made the playoffs	
Independent variables	Coefficient	t-statistic	Coefficient	t-statistic
Coach is African American	0.942	2.36	-0.170	-0.77
Regular season wins	-0.415	-5.04	-0.493	-1.01
Whether in playoffs	-0.524	-0.88		
Wins in playoffs			-0.486	-0.56
Total years with team	0.322	2.44	2.983	1.96
Square of total years with team	-0.014	-1.56	-0.308	-1.86
Constant	0.337	0.67	-3.769	0.54

Controlling for Team Quality

One potential explanation for the stronger performance of African American coaches could be that the stronger teams hire African American coaches, and the weaker teams hire white coaches. This pattern might occur if the teams that were most focused on results – that is those that were less discriminatory – were more likely to hire African American coaches. In this case, a finding that the stronger teams hire African American coaches is consistent with racial discrimination against African American coaches. There is some evidence that it is the case.

Table 7 shows the average prior year’s record for the teams that hired African American coaches. The teams that hired African American coaches had statistically significant stronger win records, winning 7.9 games and with 14% in the playoffs in the season prior to hire versus wins of 6.0 games and 18% in the playoffs for the white coaches.

Table 7			
Average Season Wins and Playoffs in First Season for Full Season NFL Coaches by Race Where Prior Win-Loss Record Is Available, 1990-2002			
	African-American Coaches (7 full season observations)	White Coaches (80 full season observations)	t-statistic for difference by race
Average wins per year	9.6	7.1	3.42
Proportion in playoffs	71%	24%	3.38
Prior season wins	7.9	6.0	2.89
Prior season proportion in playoffs	14%	18%	0.24

When I control for the effects of the teams' prior year wins, African Americans average 1.9 more wins than whites, with a probability of .01 (2.70 standard errors) that the difference in wins would have occurred were race not a factor. The playoff advantage of African American coaches, after controlling for their teams' prior year playoff record, remains with a probability of .003 (2.95 standard errors) that chance could explain the racial difference.¹⁰ Similar analyses of the coaches' first two years versus the record of the team from the prior two years show similar results. African American coaches have more wins and greater probability of making the playoffs during their first year of coaching than do white coaches, after controlling for the team's prior record.

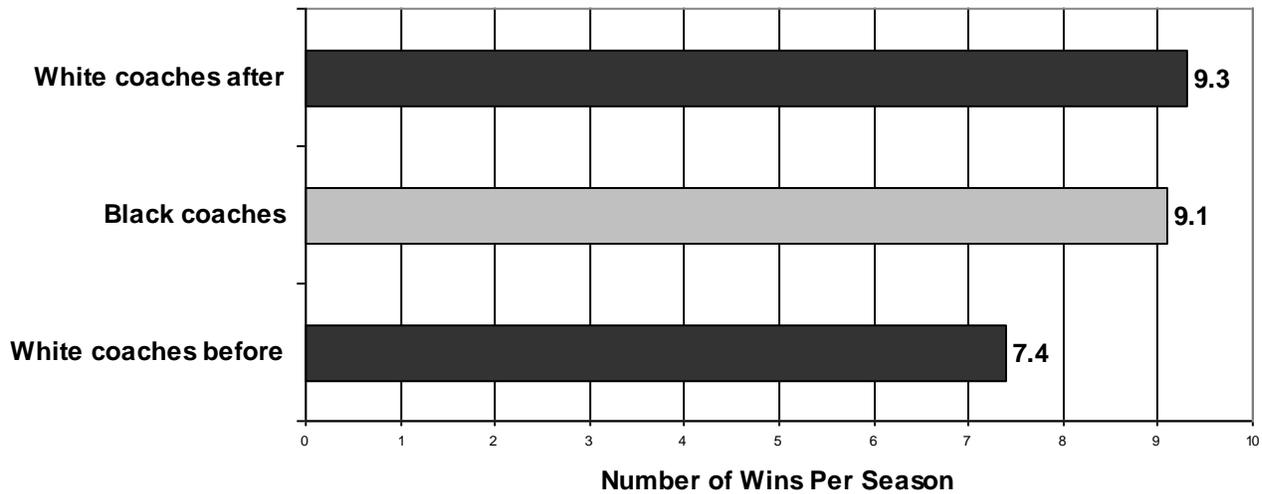
Another potential index of the quality of the team is the salaries paid to players. I compute the ratio of each team's total payroll for each year to the mean for the league in the year. The results of a robust regression of race and the salary ratio on regular season wins and a logistic regression of whether the team made the playoffs on race and the salary ratio for the 1990-2001 seasons, clustered by coach, are reported on Table 8.¹¹ After controlling for total team payrolls, African American coaches win 1.1 more games in the regular season and are significantly more likely to make the playoffs than white coaches. I also analyzed the probability of fire (as presented in Table 6) adding the salary ratio as a control variable and the racial disparity increased: the coefficient of race increased to 0.855 and the t-statistic to 2.24.

Table 8
Regular Season Wins and Probability of Making the Playoffs by Race, 1990-2001,
Controlling for Team Salaries

Independent variables	Regular Season Wins		Whether Made Playoffs	
	Coefficient	t-statistic	Coefficient	t-statistic
Coach is African American	1.070	2.07	1.131	2.71
Ratio of Team Payroll to League Mean	5.074	4.21	2.671	3.02
Constant	2.950	2.42	-3.076	-3.42

A simpler way to consider team quality is to examine the win-loss records of white and African American coaches only for the six teams (Green Bay Packers, Minnesota Vikings, New York Jets, Oakland Raiders, Philadelphia Eagles, and Tampa Bay Buccaneers) that have hired African American coaches. Chart 1 illustrates the season wins for white coaches who preceded the African American coaches (7.4) (the bottom bar on the chart), for African American coaches (9.1) (the middle bar on the chart), and for those white coaches who followed the African American coaches (9.3) (the top bar on the chart) for these six teams. Once again, African American coaches for these six teams had more wins than the white coaches who preceded them. African American coaches have 0.2 less wins, however, than the white coaches who succeeded them.

Chart 1
Average Total Wins in a Full Season by Race of Coach, NFL Teams with African American Coaches, 1986-2002



Summary of Performance Analyses

The uniformity of the results of comparing regular season wins and participation in playoffs for white and African American coaches in various ways is striking. No matter how we look at regular season success, African American coaches have performed better.¹² These data are consistent with African Americans having to be better coaches than whites in order to be hired as a head coach in the NFL.

The evidence on firing is more ambiguous. On the one hand, the evidence of African Americans performing better than whites when they are fired is weaker than for hiring. The regular season records of African American coaches are insignificantly better than those of whites when they are forced to leave their jobs. Although playoff win-loss records are more difficult to analyze, there is evidence that African American coaches have fewer wins (0.4 wins) than white coaches. The ambiguous racial differences in playoff win records do not appear to affect hiring, but are more likely to affect firing decisions.¹³ On the other hand, the direct evidence of the likelihood that a coach is fired given his regular season performance, team quality (as measured by salaries) and time on the job, show that African Americans are significantly more likely to be fired.

African Americans who make the playoffs are insignificantly less likely to be fired, however, given their playoff win records, than white coaches who make the playoffs.

The stronger performance of African American coaches, the surprising statistical strength of the findings given their small numbers, and the direct evidence on the effect of race on firing suggests that African Americans are being held to a higher standard when NFL coaches are hired and when they are fired. These findings are consistent with racial discrimination against African American coaches.

Some studies of discrimination against players in professional or college sports have tried to identify the sources of the discrimination.¹⁴ They disentangle the effects of management or employer discrimination from fan or consumer discrimination by examining team revenue and attendance. Team revenue and attendance data are less able to discern these phenomena in the NFL because 95% of the available seats are sold to fans each season.¹⁵ Because attendance is less an issue for football than other sports, it appears that management or employer discrimination is the more likely source of racial discrimination against African American coaches.

A Final Comment: Not Just the Pipeline

Because African American coaches perform better than white coaches, it appears that the small number of African American head coaches hired is likely to be more than a “pipeline” problem. Furthermore, African Americans are substantially better represented among NFL players and assistant coaches than they are in head coaching positions. African Americans are only 6% of the individuals who were head coaches for at least a full season in the NFL between 1990 and 2002, but they are currently 28% of the NFL assistant coaching staff and 67% of the players.

The beginning of the pipeline is the first experiences of African Americans and whites as football players. There could be player positions that are more likely to produce coaches and it could it be that African Americans are relatively less represented among those player positions. Others (see Kahn (1991) for examples) have noted that racial differences in particular jobs, or player positions, within a sport may arise from discrimination in the selection of people for the jobs or from differential opportunities between African American and white neighborhoods and schools to obtain the training and resources that contribute to developing skills for those jobs or position. Scully (1989) contended that part of the reason for the low number of African American baseball managers was that managers typically came from player positions where African Americans were underrepresented.

Some data suggest that racial differences in player positions do not account for racial disparities among head coaches in football. Table 9 shows the positions played by the NFL 2002 coaches. The position listed is for NFL play when the coach had NFL playing experience. For the majority of coaches who had no NFL playing experience, the college position is listed. Unlike baseball, there does not appear to be a single position or set of positions that dominate the playing experiences of NFL head coaches. The positions that have historically included more African American players – defensive back and running back – were the positions played, including both college and NFL players, by 11 of 32 coaches, while the positions that have historically included fewer African American players – quarterback, center, guard, and linebacker – were the positions played by 16 of 32 coaches. If we restrict the comparisons to coaches who have played in the NFL, 5 of the 11 coaches were in positions that historically include more African Americans and 4 of the 11 were in positions that historically include more white players.

The playing histories reported in Table 9 suggest, however, another source of racial disparity. Twenty-one of these 32 NFL head coaches had no NFL playing experience, but came to

NFL coaching from college football coaching experiences. All of the coaches with no NFL playing experience are white. Currently, the representation of African Americans among college head football coaches is even lower than in the NFL. The Northeastern University's Center for the Study of Sport in Society *2001 Racial and Gender Report Card* indicates that only 4.7% of Division 1A football coaches are African American. The hiring practices of the athletic staffs of the nation's colleges and universities appear to be contributing to the under representation of African Americans in the "pipeline" for NFL head coaching jobs.

Table 9
2002 NFL Coaches, Teams, and Previous Playing Position

Name	Team	Playing Position	General Racial Makeup of Position*	
			All Positions	NFL Only
Dave McGinnis	Arizona Cardinals	College defensive back	AA	
Dan Reeves	Atlanta Falcons	Running back	AA	AA
Brian Billick	Baltimore Ravens	College tight end	N	
Gregg Williams	Buffalo Bills	College quarterback	w	
John Fox	Carolina Panthers	College defensive back	AA	
Dick Jauron	Chicago Bears	Safety/running back	AA	AA
Dick LeBeau	Cincinnati Bengals	Cornerback	AA	AA
Butch Davis	Cleveland Browns	Defensive back	AA	AA
Dave Campo	Dallas Cowboys	College defensive back	AA	
Mike Shanahan	Denver Broncos	College quarterback /defensive back	N	
Marty Mornhinweg	Detroit Lions	College quarterback	w	
Mike Sherman	Green Bay Packers	College guard/linebacker	w	
Dom Capers	Houston Texans	College safety/linebacker	w	
Tony Dungy	Indianapolis Colts	Defensive back/halfback	AA	AA
Tom Coughlin	Jacksonville Jaguars	College wingback	AA	
Dick Vermeil	Kansas City Chiefs	College quarterback	w	
Dave Wannstedt	Miami Dolphins	College offensive lineman	N	
Mike Tice	Minnesota Vikings	Tight end	N	N
Bill Belichick	New England Patriots	College center	w	
Jim Fassel	New York Giants	College quarterback	w	
Herman Edwards	New York Jets	Defensive back/halfback	AA	
Jim Haslett	New Orleans Saints	Linebacker	w	w
Bill Calahan	Oakland Raiders	College quarterback	w	
Andy Reid	Philadelphia Eagles	College offensive tackle/guard	w	
Bill Cowher	Pittsburgh Steelers	Linebacker	w	w
Marty Schottenheimer	San Diego Chargers	Linebacker	w	w
Mike Holmgren	Seattle Seahawks	College quarterback	w	
Steve Mariucci	San Francisco 49ers	College quarterback	w	
Mike Martz	St Louis Rams	College tight end	N	
Jon Gruden	Tampa Bay Buccaneers	College quarterback	w	
Jeff Fisher	Tennessee Titans	Safety	N	N
Steve Spurrier	Washington Redskins	Quarterback	w	w

* AA means the position, historically in the NFL, has been disproportionately African American; w means the position is disproportionately white; N means there is relative racial neutrality, based on Scully's (1973) study. When two positions are reported and one is neutral, I use the racial designation of the other position.

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Notes

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- ¹ I start with 1990 because that is the first year in the "modern era" that has an African American coach for the full season, Art Shell at the Oakland Raiders.
- ² U.S. Census Bureau, *Statistical Abstract of the United States 2000*, No. 10, p. 12. Percentage computed by author from population counts on table.
- ³ As Lawrence Kahn has brought to my attention, the real indicator of discrimination in hiring is not whether there are racial differences in the performance of the average coach, but whether there are racial differences at the margin, that is, whether the marginal or last African American coach hired is better than the marginal white coach. It is possible to have white coaches

performing better than African American coaches on average and still have discrimination against African American coaches. This situation could arise if some white coaches perform extremely well while the marginal white coach is worse at the margin than the marginal African American coach. This is not the case here. Because the only coaches to make it to the Super Bowl are white, and because the average performance of African American coaches is better than that for white coaches when these high performers are included, the evidence supports the premise that the marginal white coach is inferior to the marginal African American coach.

⁴ Kahn (1991) attributes the paucity of such studies to the unavailability of individual performance statistics.

⁵ Salary data for 2002 were not available. Stefan Szymanski provided the salary data in electronic form for 1989-2000.

⁶ The following 27 full season white coaches (of the total 90 in the 1986-2002 data base and of the 54 who have led a team to the playoffs) have had a winning playoff record in a single season for the duration of this data set: Jon Gruden, Bill Calahan, Andy Reid, Bill Cowher, Bill Parcells, Bobby Ross, Dan Reeves, Jerry Burns, Jim Fassel, Joe Gibbs, Bill Walsh, John Robinson, Marty Schottenheimer, Mike Martz, Sam Wyche, Ted Marchibroda, Tom Coughlin, George Seifert, Marv Levy, Jimmy Johnson, Barry Switzer, Mike Holmgren, Mike Shanahan, Dick Vermeil, Jeff Fisher, Brian Billick, and Bill Belichick. Seven of these white coaches do not have *overall* winning playoff records between 1986 and 2001, including Bill Cowher (7-8), Bobby Ross (3-5), Jerry Burns (3-3), John Robinson (2-3), Marty Schottenheimer (5-11), Mike Martz (2-2), and Tom Coughlin (4-4). Other prominent white coaches, such as Don Shula (3-4) and Mike Ditka (2-5), did not have a winning playoff record within a season between 1986 and 2002 and, therefore, also have overall losing playoff records.

⁷ There are more African American and white coaches (e.g., 7 and 84) with a first season than there are total coaches (e.g., 5 and 77) because some coaches coach for more than one team and hence have more than one first year with a team.

⁸ This is in contrast to hiring, where data on the racial composition of all sources of NFL coaches hired in the time period are not available.

⁹ I thank Lawrence Kahn for suggesting a direct examination of firing by race.

¹⁰ At the suggestion of a referee, I repeated these two analyses adding a control for whether the first year coach had previously been a first year coach. Because all of the regression results reported in this paper used a clustering of observations on the same coach, it is not at all surprising that the regression results were the same and the additional control variable was not significant.

¹¹ I thank Stefan Szymanski for suggesting this approach to me and also for providing electronic data on team payrolls for 1989-2000.

¹² The small number of African American coaches hired by NFL teams makes it difficult to conduct more extensive statistical analyses of racial differences; that is, analyses including or controlling for more variables. While most of the racial differences reported here are strong enough that a statistical test dismisses chance as the reason for racial differences, in the end, there are simply too few African American coaches for more detailed statistical analyses to be powerful.

¹³ Only Jon Gruden of the 2002 Tampa Bay Buccaneers led his teams to the Super Bowl during his first season of coaching between 1990 and 2002.

¹⁴ See Kahn (1991, 2000) for discussion of these studies.

¹⁵ Based on authors computations from NFL reports of attendance by team and stadium capacity.