Topics in Economic Analysis & Policy

Volume 5, *Issue* 1 2005 *Article* 4

Do People Value Racial Diversity? Evidence from Nielsen Ratings

Eric M. Aldrich* Peter S. Arcidiacono†

Jacob L. Vigdor‡

*University of Washington, eric@stat.washington.edu

†Duke University, psarcidi@econ.duke.edu

‡Duke University, jacob.vigdor@duke.edu

Do People Value Racial Diversity? Evidence from Nielsen Ratings*

Eric M. Aldrich, Peter S. Arcidiacono, and Jacob L. Vigdor

Abstract

Nielsen ratings for ABC's Monday Night Football are significantly higher when the game involves a black quarterback. In this paper, we consider competing explanations for this effect. First, quarterback race might proxy for other player or team attributes. Second, black viewership patterns might be sensitive to quarterback race. Third, viewers of all races might be exhibiting a taste for diversity. We use both ratings data and evidence on racial attitudes from the General Social Survey to test these hypotheses empirically. The evidence strongly supports the taste-for-diversity hypothesis, while suggesting some role for black own-race preferences as well.

KEYWORDS: Customer Discrimination, Racial Diversity, Learning

---

*We thank the editor, Don Fullerton, two anonymous referees, Katie Aldrich, Charles Clotfelter, Greg Crawford, Paul Ellickson, James T. Hamilton, David Ridley, and Marc Rysman for valuable comments and conversations. We also thank Robert Kelley for research assistance. Corresponding author: Peter Arcidiacono, Department of Economics, Duke University, Durham, NC 27708.

1 Introduction

Few observers would dispute the argument that racial discrimination in American society has declined in the past half-century. It is also true, however, that few observers would dispute the persistence of racial gaps along many socioeconomic dimensions. Among the many explanations for this persistence is what Becker (1957) termed customer discrimination: the tendency for consumers to prefer products or services that are sold or provided by members of their own group. This form of discrimination is particularly insidious in that it will generally not be competed away by profit-maximizing firms. Documenting and measuring the extent of customer discrimination provides policy-makers with important information on the most promising routes for further reducing racial disparities in society.

A number of recent studies have documented employment and wage differentials based on customer discrimination, or other evidence of market outcomes that reflect consumer preferences influenced by racial concerns. Holzer & Ihlanfeldt (1998) show that firms with white clientele are less likely to hire black workers. Additional research has found evidence of customer discrimination, in the form of attendance, television ratings, or other metrics, in the market for sports entertainment (Kahn & Sherer, 1988; Nardinelli & Simon, 1990; Hanssen & Andersen, 1999; Kanazawa & Funk, 2001; see Kahn, 2000 and Kahn, 1991 for literature reviews). Evidence of own-race preferences and firm responses to these preferences has been shown in the markets for radio broadcasts (Waldfogel, 2003a), newspapers (George & Waldfogel, 2003) and television broadcasts (Waldfogel, 2003b).[1] In housing markets, evidence suggests that preferences for a disproportionate share of own-race neighbors plays a central role in perpetuating segregation (Cutler *et al.* , 1999; Bayer *et al.* , 2004; Vigdor, 2003). Evidence of discriminatory attitudes can also be found in recent literature in public finance and development, which shows that various forms of civic behavior are less prominent in racially or ethnically diverse communities (Alesina *et al.* , 1999; Alesina & La Ferrara, 2002, 2000; Easterly & Levine, 1997; Luttmer, 2001; Gugerty & Miguel, 2005; Oberholzer-Gee & Waldfogel, 2005; Poterba, 1997; Vigdor, 2004).

This paper finds evidence of consumer preferences for producers of a different race, a finding somewhat at odds with the bulk of existing literature. The "producers" in question are quarterbacks of professional football teams, who produce a form of entertainment service.[2] We examine Nielsen ratings for ABC's *Mon-*

[1] McGowan (2001) argues, somewhat contrarily, that television news reporting has suffered because of a commitment to diversity.

[2] Hanssen & Andersen (1999) show some evidence that black baseball players received more all-star votes than otherwise identical white non-Hispanic players in 1996. Their results are sensitive to the regression specification employed. Carney & Fenn (2004) provide additional analysis of

day Night Football games between 1997 and 2001 and show that games featuring at least one black quarterback generate significantly higher ratings than games where both quarterbacks are white. This effect is quite large, with two million more viewers watching an average game in 1998. A rough calculation suggests that this increased viewership translates into an over two million dollar increase in advertising revenue per broadcast.[3]

The black quarterback effect points towards viewers valuing diversity, but is also consistent with other hypotheses: that quarterback race proxies for other player or team characteristics, that black quarterbacks are a novelty attracting only fleeting attention from the viewing public, or that black quarterbacks increase viewership solely within the black population. Given the relatively small number of black quarterbacks (twelve in our sample), the results might also be driven by a small number of "superstar" players. We test these alternative hypotheses in a number of ways, controlling for observable team and player characteristics, dropping individual players from the sample, and testing for time trends in viewership patterns. The results of these tests are more consistent with a preference for diversity than with any individual alternative hypothesis.

To provide more concrete evidence that the black quarterback effect reflects preferences for diversity, we compare variation in the estimated magnitude of the effect across demographic groups to patterns of response to racial tolerance questions in the General Social Survey (GSS). Across groups, the magnitude of the black quarterback effect and the degree of racial tolerance expressed by white GSS respondents correspond almost perfectly. This correspondence exists in black racial attitudes as well, suggesting that black own-race preferences, to the extent they exist, complement overall preferences for diversity.

Following our presentation of this evidence, we argue that some previous empirical evidence drawn from sports attendance and television ratings can be re-

---

the determinants of NFL viewership in their analysis of Nielsen ratings for broadcasts in the 2000 and 2001 seasons. For a scholarly analysis of the portrayal of black roles on contemporary television, see Entman & Rojecki (2001). For a historical account of racial integration in professional football, see Levy (2003).

[3]Presumably, a preference for black quarterbacks among consumers of professional football should be measurable in other dimensions, such as game attendance, ticket prices, player salaries, and product endorsements. Effects along some of these margins, however, will be muted because of the National Football League's revenue sharing agreements. This reduces one team's return to an increase in broadcast revenue generated by that team. Effects on other metrics, such as salaries and ticket prices, would be difficult to identify because of insufficient variation: teams typically charge a single ticket price for all games each year, and players often sign multi-year contracts. Prior studies have examined metrics including player salaries (Dey, 1997; Kahn & Sherer, 1988), all-star balloting (Hanssen & Andersen, 1999), and memorabilia prices (Nardinelli & Simon, 1990).

interpreted as consistent with diversity effects. Overall, both survey responses and viewership patterns suggest that the greatest preferences for diversity are among relatively young age cohorts. This pattern, in turn, suggests that the valuation of race and racial diversity might indeed be increasing in the American marketplace, not just in the nation's courtrooms and classrooms. A positive market valuation of racial diversity would bolster arguments in favor of maintaining diversity on college campuses and in other places.

2 Data

Our dataset contains information on quarterback characteristics, team characteristics, and market characteristics. The internet was our primary source of information in forming a database of the quarterback and team characteristics for NFL seasons between 1997 and 2001. Web pages such as espn.com and cbs.sportsline.com were used to obtain annual quarterback ratings, quarterback photos, game schedules, and season wins. Past issues of *Sports Illustrated* were used to find predicted wins for each season.

The primary market characteristic in this study is market size. To estimate market size, we used population data from the Complete Economics and Demographic Data Source (CEDDS), published by Woods & Poole Economics Inc., a private business that compiles forecasts of economic and demographic data. In most cases we used population data for Metropolitan Statistical Areas (MSA's), however at times it was more appropriate to use data that were published for Consolidated Metropolitan Statistical Areas (CMSA's), which are the consolidation of two areas that were formerly MSAs. Examples of this include the San Francisco-Oakland CMSA and the Baltimore-Washington CMSA.[4]

We purchased data on television viewership directly from Nielsen Media Research, the primary source of viewership data for corporations nationwide. We obtained data for all Monday Night Football games televised on ABC, a total of 82 games over five seasons.[5] For each game, Nielsen provides the number of viewers for the following groups:

- Males between the ages of 18 and 34

[4]For CMSA's or MSA's with two teams, we estimated market size by dividing the population by two. This did not affect the results on the black quarterback variable at all, but does make the population variables significant.

[5]Hamilton (1998) also analyzes Monday Night Football broadcasts, showing specifically that the popularity of this program among male viewers leads competing networks to alter the use of violent content in their programming.

- Males between the ages of 18 and 49
- Anyone older than 2 years of age.

Using these data, we calculated the number of viewers for males ages 18-34, males ages 35-49, and all other viewers. Our database thus contains 246 viewership observations for 82 games.[6]

Table 1: Black quarterbacks represented in the dataset

Quarterback	Number of times observed	Team(s)
Kordell Stewart	7	Pittsburgh
Steve McNair	4	Tennessee
Daunte Culpepper	3	Minnesota
Shaun King	3	Tampa Bay
Randall Cunningham	2	Dallas, Minnesota
Ray Lucas	2	NY Jets
Anthony Wright	2	Dallas
Tony Banks	1	Washington
Charlie Batch	1	Detroit
Aaron Brooks	1	New Orleans
Donovan McNabb	1	Philadelphia
Spergon Wynn	1	Minnesota

Of the 164 starting quarterback positions available in our data, a black player occupied the position 28 times. These observations are divided among twelve individuals, listed in Table 1. Within this small group of individual players, one (Kordell Stewart) contributed one-fourth of all observations, and three others (Steve McNair, Daunte Culpepper, and Shaun King) account for another fourth.[7]

Table 2 lists the teams represented in our dataset, categorized by race of the starting quarterback. Twenty-eight different teams appeared on the broadcast at least once over the five-season period. Ten of these teams were represented by a black starting quarterback at least once. Of these ten, eight were represented by both black and white starting quarterbacks on separate occasions.

[6] In all regression specifications below, we correct standard errors to reflect the possibility that observations corresponding to the same game have correlated error terms.

[7] The relative concentration of black quarterback observations within a small group of individual players raises concerns regarding the identification of any group-wide effect. We pay specific attention to these concerns in our discussion of the results below.

Table 2: Football teams represented in the dataset

Black QB's Only		Both Black and White QB's			White QB's Only	
Team	obs	Team	Black obs	White obs	Team	obs
Pittsburgh	7	Tennesee	4	1	Denver*	13
New Orleans	1	Dallas	3	8	Green Bay	12
		Minnesota	3	4	Miami	10
		Tampa Bay	3	3	San Francisco	10
		NY Jets	2	5	Jacksonville	8
		Washington	1	6	New England*	8
		Philadelphia	1	3	Kansas City	6
		Detroit	1	2	NY Giants	6
					Saint Louis*	6
					Oakland	5
					Buffalo	4
					Indianapolis	4
					Atlanta	3
					Carolina	3
					Baltimore*	2
					Seattle	2
					Arizona	1
					Chicago	1

* Super Bowl winner. Denver won twice over the sample period, 1997 and 1998.

Summary statistics for regression covariates used in this analysis appear in Table 3. Here, the unit of observation is the individual game broadcast. This table stratifies observations by whether a black quarterback started for either team. For each game, we averaged the home and visiting teams' player, team, and market characteristics. In most respects, games featuring black quarterbacks are fairly similar to those with white quarterbacks. Games with black quarterbacks tend to feature teams with slightly more wins but slightly fewer total points scored. Two measures of quarterback output are ratings that emphasize passing ability and rushing yards, but these differ in opposite directions. Black quarterback games tend to feature teams from smaller markets, yet still manage to have ratings that are roughly comparable and in some cases higher than other games. Finally, the mean year for games with a black quarterback is a half year higher than the corresponding mean with only white quarterbacks. This difference can partly be explained by the increased prevalence of black starting quarterbacks: the number

Table 3: Means by starting quarterback race, Monday Night Football sample

		Two white quarterbacks	At least one black quarterback
Team Characteristics	Wins	8.750	9.000
		(0.246)	(0.397)
	Predicted Wins	9.905	10.104
		(0.211)	(0.382)
	Points	355	341
		(6.32)	(11.24)
Player Characteristics	QB Rating	81.64	77.89
		(1.15)	(2.20)
	QB Rushing Yards	9.06	15.75
		(0.69)	(1.29)
MSA Size (000's)	Males (20-34)	679	612
		(41.5)	(62.1)
	Males (35-49)	800	741
		(46.0)	(74.1)
	All Others	6040	6000
		(374)	(629)
Viewers (000's)	Males (18-34)	2870	2968
		(65.8)	(97.7)
	Males (35-49)	3870	3849
		(81.1)	(124.3)
	All Others	12253	12459
		(233)	(349)
	Year	1998.8	1999.4
		(0.18)	(0.26)
	Observations	58	24

increased from four to seven between 1997 and 2001. A second factor, examined in greater detail below, is that the likelihood of a team with a black quarterback appearing on the broadcast increased over time.

The mean differences in viewership, the fourth set of rows in Table 3, reveal that ratings were higher for games involving at least one black quarterback. Our regression results below confirm this pattern, and indeed show that it is understated here. This understatement can be attributed to the fact that games with black quarterbacks tended to occur in later seasons when overall ratings for the broadcast were lower.[8]

The summary statistics in Table 3, which average characteristics for both teams competing in a particular game, might obscure important differences in characteristics between competing teams. Table 4 addresses this concern by reporting summary statistics where the unit of observation is the team, rather than the game, stratifying teams by whether they are represented by a black quarterback. These summary statistics bring some contrasts between the two types of teams into starker relief. Teams led by black quarterbacks win similar numbers of games despite producing fewer points, on average. Black quarterbacks themselves are rated as less efficient passers, but accumulate more than twice the rushing yardage of white quarterbacks on average. Finally, black quarterbacks tend to be based in smaller television markets.

3 Model

Individual i belonging to race $r \in \{0, 1\}$ decides whether or not to watch one of a series of football games. We specify the utility of watching the jth football game as:

$$U_{irj} = \beta_{0r} + \beta_1 T_j + \beta_2 P_j + (\beta_{3d} + r\beta_{31} - (1-r)\beta_{30})QB_j + \eta_{rj} + \epsilon_{irj} \quad (1)$$

where T_j are observed characteristics of the teams playing, P_j are observed characteristics of the players including the quarterbacks, and QB_j is an indicator variable for whether the jth game involves at least one quarterback with r=1. The two unobservables, η_{rj} and ϵ_{irj}, are unobserved characteristics of the product and the unobserved preferences of the individual, respectively. The impact on utility of watching a black quarterback is allowed to vary with the viewer's race. Own-race

[8]Lower ratings for Monday night broadcasts parallel an overall decline in ratings for professional football during this time period, rather than any failure on the part of ABC to secure the rights to better broadcasts.

Table 4: Comparing observable characteristics of teams with white and black quarterbacks

		White QB Teams	Black QB Teams
Team Characteristics	Wins	8.82	8.86
		(0.240)	(0.589)
	Predicted Wins	10.00	9.79
		(0.187)	(0.504)
	Points	355	330
		(6.13)	(12.22)
Player Characteristics	QB Rating	81.36	76.58
		(1.10)	(3.08)
	QB Rushing Yards	8.79	21.86
		(0.62)	(1.56)
MSA Size (000's)	Males (20-24)	338	290
		(19.5)	(34.6)
	Males (35-39)	400	348
		(22.0)	(35.0)
	All Others	3069	2747
		(181)	(400)
	Observations	136	28

effects exist for whites and blacks if β_{30} and β_{31} are positive, respectively. With black quarterbacks being in the minority, diversity effects exist if β_{3d} is positive.[9]

With the assumption that the ϵ's are i.i.d. extreme value, the share of race r individuals choosing to watch the jth game is given by:

$$s_{rj} = \frac{\exp(\beta_{0r} + \beta_1 T_j + \beta_2 P_j + (\beta_{3d} + r\beta_{31} - (1-r)\beta_{30})QB_j + \eta_{rj}}{\exp(\beta_{0r} + \beta_1 T_j + \beta_2 P_j + (\beta_{3d} + r\beta_{31} - (1-r)\beta_{30})QB_j + \eta_{rj}) + 1} \quad (2)$$

where the utility of not watching is normalized to zero.

Taking the log of the ratio of the share choosing to watch over the share choosing not to watch yields the following linear expression:

$$\ln(s_{rj}) - \ln(s_{ro}) = \beta_0 + \beta_1 T_j + \beta_2 P_j + (\beta_{3d} + r\beta_{31} - (1-r)\beta_{30})QB_j + \eta_j \quad (3)$$

[9]In addition to measuring own-race and diversity effects, econometric estimates of the coefficients on the black quarterback variable may reflect player attributes that are both correlated with race and omitted from the vector P_j. While we cannot quantitatively address the issue of whether quarterback race proxies for some other player characteristic, we show below that controlling for observable quarterback characteristics actually increases estimates of the black quarterback effect.

With the added assumption that η_j is normally distributed, consistent, unbiased, and efficient, estimates can be obtained through ordinary least squares.

Unfortunately, estimation of two race-specific market share equations (3) will not allow us to identify the three potential black quarterback effects. Furthermore, we are hampered by the fact that our Nielsen ratings data are not differentiated by race. In our econometric work below, we will measure an aggregated version of equation (3) that omits race subscripts and groups the three potential black quarterback effects into a single coefficient.[10] Our estimate of the undifferentiated β_3 will reflect some combination of own-race and/or diversity effects. To distinguish whether a particular positive estimate of β_3 represents diversity effects or black own-race effects, for example, it will be necessary to appeal to other data sources as well as simple common sense.

4 Documenting the black quarterback effect

Table 5 displays OLS estimates of the log share equations, where we pool the 246 ratings observations on 82 Monday Night Football broadcasts for three separate demographic groups and allow a fixed effect for each group.[11] These specifications also control for year and week-of-season fixed effects.[12] The first reported specification controls only for these fixed effects. The second column adds average quarterback characteristics for the two teams, including the passing-based rating measure and rushing yards. The third adds team characteristics using controls for the two teams' actual total wins for the season, *Sports Illustrated*'s predicted wins, and points scored by the two teams. The fourth column adds log population of the relevant demographic group for the metro areas associated with the teams.[13]

Beginning with the most basic set of controls, in column (1) the black quarterback is positive and statistically significant at the 5% level. The magnitude of

[10]George & Waldfogel (2003) face a similar problem in their study of race and newspaper readership. In their case, however, access to subscription data at the zip code level allow them to make some inference about racial readership patterns in segregated areas.

[11]These demographic group fixed effects have very strong explanatory power – football broadcasts are much more popular among young adult males than among other groups. This, more than any other factor, explains the remarkably high R^2 values associated with the regressions in Table 5.

[12]Since the number of independent observations for most explanatory variables is 82, or the total number of games observed, we use the Huber-White procedure to derive standard error estimates. In other words, we correct for the presence of three possibly non-independent observations on each broadcast.

[13]We experimented with different functional forms for the population characteristics. Using alternative measures had little effect on the coefficient on the black quarterback variable.

Table 5: The effect of a black quarterback on Monday Night Football ratings[†]

Independent variable	(1)	(2)	(3)	(4)
At least one black starting QB	0.088*	0.132*	0.127*	0.132*
	(0.041)	(0.042)	(0.033)	(0.033)
Average QB rating		0.004*	-0.002	-0.003
		(0.002)	(0.002)	(0.002)
Average QB yards rushing		-0.006*	-0.006*	-0.006*
		(0.003)	(0.003)	(0.003)
Total wins, both teams			0.019*	0.020*
			(0.010)	(0.010)
Predicted wins, both teams			-0.004	-0.004
			(0.005)	(0.005)
Points scored, both teams (00's)			0.124*	0.129*
			(0.040)	(0.040)
ln(population), for team markets				0.040
				(0.023)
Year fixed effects	Yes	Yes	Yes	Yes
Week fixed effects	Yes	Yes	Yes	Yes
R^2	0.865	0.875	0.898	0.900

[†]246 observations. Dependent variable is log share of viewers. Regressions pool ratings observations for three demographic categories: males 18-34, males 35-49, and all others. Regressions include demographic group effects. Standard errors, corrected for grouped observations, in parentheses. * =significant at 95% level.

the estimated effect increases substantially once we control for player and team observable characteristics. In the fourth specification, the estimated coefficient implies a 13% increase in viewership associated with broadcasting a game with at least one black quarterback, other things equal. This same specification indicates that games featuring teams with fewer yards rushing tend to attract more viewers. As rushing yardage is one of the most prominent differences between black and white quarterbacks in our sample, this finding argues against interpreting the black quarterback effect as a style-of-play effect. Viewers show a strong preference for offense-generating teams, and for those with higher numbers of wins. Ratings show a tendency, albeit an insignificant one, to be higher when the game features teams from larger metropolitan areas.[14]

[14]In specifications not reported here, we estimated the model using ratings for a second weekly broadcast, ESPN's *Sunday Night Football*. We found no significant black quarterback effect using

The statistics in Table 1 reveal that the majority of black quarterback observations in our data are provided by a relative handful of individual players. Thus, it is entirely possible that idiosyncratic viewer preferences for one player could explain the effects shown in Table 5. To test this, we re-estimated these specifications, omitting one player from the analysis each time. In each of these twelve sets of alternative specifications, we found a statistically significant coefficient on the black quarterback variable.[15]

How many viewers does having a black quarterback add? Evaluating at the means for teams that were selected for Monday Night Football games in 1998 shows that having a game with a black quarterback increased viewership from 19.28 million to 21.40 million– or more than two million viewers. Perhaps more important is how these viewers affect advertising revenue. The average advertising rate for a thirty second commercial during Monday Night Football games in 1998 was $380,000 (Mandese, 1999). Not including the pregame show for which the rates are lower, industry sources report an average of fifty thirty second commercials per game. Should a percent increase in viewers translate into a percent increase in advertising revenue (which need not be the case; the marginal viewer may be more or less likely to buy products than the average viewer) the increased viewership from showing a black quarterback in one game would yield an increase of over 2 million dollars in advertising revenue. For purposes of comparison, ABC's contract for the broadcast rights to Monday night games between 1998 and 2004 set a price of $550 million per year.[16] Thus, according to these back-of-the envelope calculations, broadcasting at least one team with a black quarterback would boost revenue by an amount sufficient to offset roughly 6% of ABC's per-game costs of acquiring broadcast rights.

To investigate whether the black quarterback effect varies by age and gender,

these data. However, these games generally have teams of much lower quality and are shown on the same day as the Sunday afternoon games on the major networks. Only the most loyal fans are likely to watch this broadcast– a group which is unlikely to be affected by the race of the quarterback. The possibility that race effects are driven by marginal fans is consistent with existing evidence on professional basketball, where white basketball player effects are often stronger in television ratings than in attendance (Kanazawa & Funk, 2001; Kahn & Sherer, 1988; Dey, 1997).

[15]As a further test, we estimated models using team fixed effects, identifying the black quarterback effect by examining ratings for teams broadcast multiple times with quarterbacks of different races. The black quarterback in this specification was positive but insignificant. Dropping a single team, the Dallas Cowboys, from this specification restores the statistical significance of the black quarterback effect. In fixed effects specifications the Cowboys' two black quarterbacks are being compared to white quarterback Troy Aikman, who led the team to three championships.

[16]See James, Meg, "ABC Says It Expects to Renew NFL Agreement," *Los Angeles Times*, January 24, 2005. This article notes that the broadcast has actually lost money for the network over this time period.

Table 6: The black quarterback effect: variation across demographic groups[†]

Demographic group	Black quarterback coefficient	R^2
Males 18-34	0.185	0.615
	(0.047)	
Male 35-49	0.112	0.730
	(0.038)	
All Others	0.103	0.754
	(0.037)	

[†]82 observations in each regression. Standard errors in parentheses. Regressions control for each of the covariates listed in Table 5, including year and week fixed effects. All coefficients reported in this table are significant at the 99% level.

Table 6 presents the results of regressions that separate the three demographic groups for which we have ratings data. Only the black quarterback coefficients are displayed in this table, however each regression controls for the complete set of covariates found in column (4) of Table 5. The point estimates suggest that the black quarterback effect is about 80% greater among males between 18 and 34 years old relative to the "all other" group, which includes females and males under 18 or over 49. The point estimates in the 35-49 year old male sample are nearly identical to those in the "all other" group. Each of the three estimated effects is significantly greater than zero at the 1% level.

Given the positive ratings impact of broadcasting games with black quarterbacks, especially within the advertiser-coveted young adult male demographic group, a logical response of network executives would be to schedule a higher fraction of such games. Table 7 presents empirical tests for such a response, probit regression models that predict the probability that a team will be selected to appear in a Monday Night Football broadcast on the basis of characteristics observable at the beginning of the season. We coded a team as having a black quarterback if such a player appeared in the starting lineup for the first regular-season game. Other team characteristics include number of wins in the previous season, points scored in the previous season, whether the team qualified for postseason playoffs in the previous season, and number of wins forecast by *Sports Illustrated* for the present season. In the final specification, we also control for estimates of the population of the team's home metropolitan area.

Column (1) reports the results of a simple bivariate regression, which shows no significant difference in the probability that a team with a black quarterback will

Table 7: Probit estimates of the probability of a team being selected for Monday Night Football†

Independent Variable	(1)	(2)	(3)	(4)
Black quarterback	-0.1863	-1.979**	-4.526**	-4.278**
	(0.2665)	(0.7734)	(1.479)	(1.491)
Constant	0.2227**	0.3072	-8.422**	-8.782**
	(0.1132)	(0.2672)	(2.025)	(2.104)
Linear time trend‡	–	-0.0252	-0.0504	-0.0523
		(0.0801)	(0.1443)	(0.1561)
Black quarterback	–	0.5449*	1.264**	1.234**
×linear time trend		(0.3073)	(0.4375)	(0.4408)
Lagged Wins	–	–	0.5534**	0.5390**
			(0.1871)	(0.1880)
Predicted Wins	–	–	0.2247*	0.2073*
			(0.1167)	(0.1185)
Lagged Points	–	–	0.0092	0.0103*
			(0.0057)	(0.0059)
Lagged Playoffs	–	–	0.6775	0.7898
			(0.6780)	(0.6819)
Estimated home MSA	–	–	–	7.66×10^{-4}
population, males 18-34				(0.0030)
Estimated home MSA	–	–	–	-0.0014
population, males 35-49				(0.0031)
Estimated home MSA	–	–	–	1.47×10^{-4}
population, all others				(1.54×10^{-4})
Log likelihood	-103.21	-99.51	-30.39	-29.67

†152 observations. Standard errors in parentheses. * =significant at 90% level ** =significant at 95% level.

‡1995, the first year of the data, is treated as year 1.

be selected for broadcast. Column (2) adds a linear time trend to the regression, along with an interaction of this time trend with the black quarterback variable. The probability of a team being selected for broadcast on Monday Night Football might change over time if, for example, the network chose to select a broader array of teams and broadcast each chosen team fewer times over the course of a season. The results indicate that the probability of being selected for broadcast was significantly lower for teams with black quarterbacks at the beginning of our sample. Over time, however, this effect dissipates and finally reverses. In the most recent years, the probability of selection was actually greater for teams with black quarterbacks than for teams with white quarterbacks.

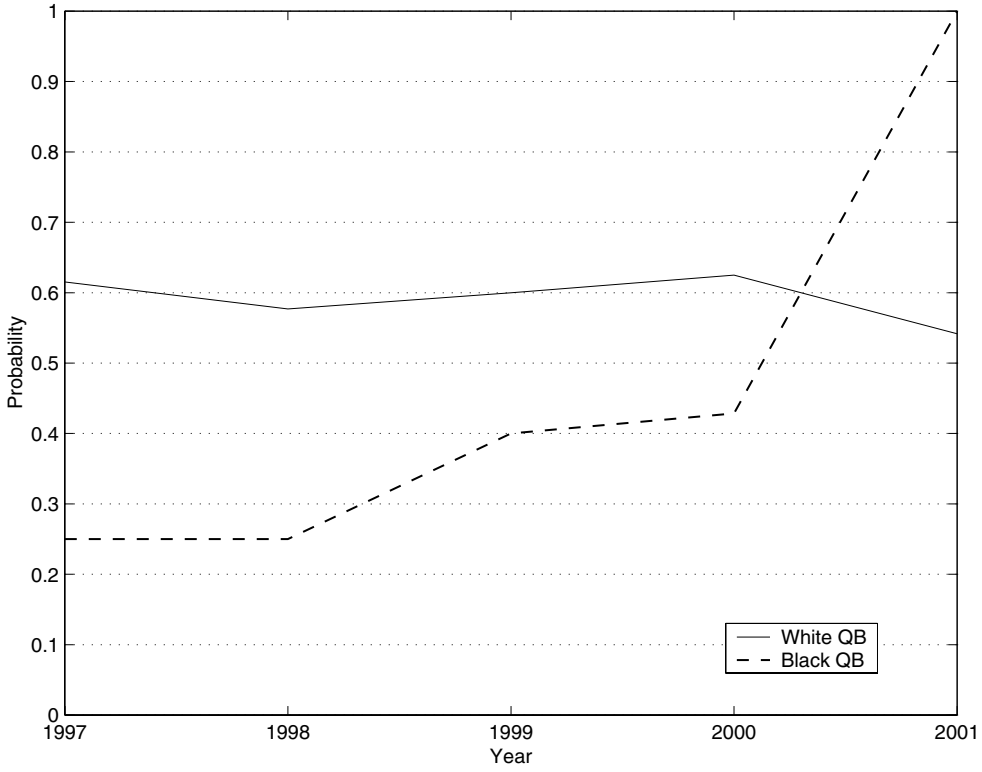
Note that the results of this probit are *not* driven by the increased number of black quarterbacks in the league. We are estimating the probability that a particular team will be selected for Monday Night Football conditional on the race of the quarterback. While increasing the number of black quarterbacks in the league will obviously increase the number of black quarterbacks given no change in network preferences, this is not relevant to the results here. These estimates show that *each team* with a black quarterback now has a higher probability for being chosen for Monday Night Football.

Figure 1 shows this relationship graphically. Between 1997 and 2000, the probability of being selected for Monday Night Football conditional on the team having a black quarterback trends gradually upward, while the probability of being selected conditional on having a white quarterback falls gradually over the time period. The former conditional probability jumps remarkably in the 2001 season, the most recent for which we have data: *all* teams with black quarterbacks were selected for broadcast, compared with about 55% of teams with white quarterbacks.

The final regressions in Table 7 add team characteristics and home metropolitan area population variables, respectively. As expected, teams with greater success in the previous season and higher predicted success for the current season are more likely to be selected for broadcast. The coefficient on black quarterback interacted with the time trend is robust to these controls.

How can this pattern be explained? One consistent explanation is that at the beginning of this time period, network executives expected the black quarterback effect on ratings to be negative. Such an expectation would be reasonable if, for example, executives considered a white own-race effect to be the dominant factor affecting ratings. Kanazawa & Funk (2001), in their study of race and Nielsen ratings for basketball games, present empirical evidence consistent with this view, although we will argue later that this evidence is also consistent with positive preferences for diversity. Own-race effects also appear to be dominant in other re-

Figure 1: Conditional probability of a team being selected for ABC Monday Night Football



cent studies of population characteristics and media markets (Waldfogel, 2003a,b; George & Waldfogel, 2003). Over time, networks may have learned through empirical observation the true direction and magnitude of the black quarterback effect, which we have shown to be apparent in even the simplest regression specifications. Their behavior in subsequent years can thus be considered a rational response to newly acquired information.

In summary, we have shown evidence of a statistically and economically significant black quarterback effect. Monday Night Football games featuring black quarterbacks have Nielsen ratings 13% higher than otherwise identical games with two white starting quarterbacks. This effect is robust across specifications, increasing in magnitude upon introduction of measures of observed quarterback ability. The effect is largest among young males and roughly identical within the other two demographic groups for which we have data. The behavior of network

executives responsible for scheduling the Monday night games suggests that these individuals took this effect into account in later years. In the next section, we show that these patterns are consistent with a taste for diversity.

5 Diversity effects or own-race effects?

The model presented in Section 3 above outlines two possible explanations for the black quarterback effect: own-race preferences on the part of black viewers, and more general preferences for racial diversity. [17] Data on viewership by race would provide an ideal opportunity to test these hypotheses. Lacking such data, we scrutinize under what conditions the black own-race effect could dominate and how consistent these conditions are with previous research. We will also incorporate data on racial attitudes from a second source, the General Social Survey (GSS), to interpret the differential effects of a black quarterback on the viewership of different demographic groups.

Before introducing this evidence, consider for a moment the black own-race hypothesis. In order for black own-race effects to explain the black quarterback effect completely, comparable own-race preferences on the part of whites and other racial groups must be negligible. Nielsen Media Research estimates that 12% of the national television viewing audience is black. Thus, in order to observe positive black quarterback effects, own-race effects within the black population must be at least eight times stronger than comparable own-race effects in the remainder of the population. Our estimate of a black quarterback ratings boost equivalent to 2.1 million viewers, if confined exclusively to the black population, would imply that at least one in fifteen blacks elects to watch Monday Night Football if and only if a black quarterback plays. The proportion would have to increase if some white viewers chose to watch the broadcast if and only if no black quarterbacks play.

Nielsen Media Research reports that approximately one in six black households watched the average Monday Night Football broadcast during the 1999 season.[18] Given that roughly one in three broadcasts features a black quarterback, a pure black own-race explanation for the black quarterback effect would imply

[17] A third possible explanation for the black quarterback is that it reflects viewer tastes for novelty, or unusual phenomena. We interpret the novelty hypothesis as suggesting that the magnitude of the black quarterback effect should decrease over time, as black quarterbacks become less anomalous. To test this hypothesis, we expanded Table 5 specifications to include an interaction between a linear time trend and the black quarterback variable. The estimated interaction was positive and statistically insignificant. This result argues against a pure novelty explanation.

[18] Note that this implies that the viewership rate for Monday Night Football broadcasts is significantly higher within the black population.

that ratings within the black population are 67% higher when the game features at least one black quarterback. The existence of white own-race effects would push this differential considerably higher.[19]

The existence of black own-race preferences of this magnitude would also be inconsistent with previous research based on professional basketball, where the majority of players are black. If black own-race effects vastly exceed white own-race effects, then television ratings should decrease as the fraction of white players increases. Kanazawa & Funk (2001) report exactly the opposite pattern: that ratings for professional basketball broadcasts in the U.S. are higher when more white players take the court. Some evidence of a similar effect in basketball game attendance exists, though the magnitude of this effect decreased in the 1990s relative to the 1980s (Kahn & Sherer, 1988; Dey, 1997). None of this evidence is consistent with a black own-race effect large enough to offset countervailing preferences in the white population.

While authors of these studies generally interpret their results as evidence of white own-race effects, it is important to note that given the minority status of white players in American professional basketball, the white own-race effect is observationally equivalent to universal preferences for diversity.[20] The diversity preference hypothesis is the only alternative capable of explaining both our results and those in the existing literature. None of the empirical evidence in the literature to date can be used to disprove the existence of own-race effects; rather this evidence suggests that any such effects are insufficient to outweigh diversity preferences.

As an additional investigation into the relative importance of diversity preferences and black own-race effects, we use data on racial attitudes and television viewing habits from the GSS. To measure racial attitudes, we examine responses to the following question asked by interviewers:

> Here are some opinions other people have expressed in connection with black-white relations. Which statement ... comes closest to how you, yourself feel? The first one is "African-Americans shouldn't push themselves where they're not wanted."

Possible responses include agree strongly, agree slightly, disagree slightly and disagree strongly. A relatively small number of respondents volunteer that they have no opinion or refuse to answer the question. This survey item (question

[19]Hanssen & Andersen (1999) similarly discount the importance of black own-race effects in explaining their finding that discrimination against black baseball players in all-star voting has declined over time.

[20]A disproportionate share of professional football players are African-American (Levy, 2003). Until recent times, however, black athletes were under-represented in the quarterback position.

127A, RACPUSH) has been analyzed in over 180 scholarly papers since it was first used in 1972.[21] To measure television viewing, we use self-reports elicited by the question "On the average day, about how many hours do you personally watch television." (Question 242, TVHOURS). To round out the analysis, we use self-reported age and race. In order to secure an adequate sample size, we pool three waves of the GSS, from 1994, 1996 and 1998.[22] To account for the likelihood that differences in racial attitudes represent cohort rather than age effects, we group individuals by their projected or actual age in 1998.

Table 8: Racial attitudes by age group and TV viewing pattern †

Category	Percent responding "Agree strongly" or "Agree slightly" to the statement "African-Americans shouldn't push themselves where they're not wanted."	Sample size
White males age 18-34	36.4%	492
White males age 35-49	40.1%	684
All other white respondents	41.6%	3117
Black males age 18-34	20.0%	75
Black males age 35-49	35.9%	92
All other black respondents	34.2%	565

†Source: General Social Survey, 1994, 1996, and 1998 waves. Age refers to respondents' age as of 1998.

We cross-tabluate the data in Table 8, collapsing the responses to the racial attitude question into a single binary variable indicating whether a respondent agrees strongly or slightly with the statement above. The first tabulation examines response patterns for whites belonging to one of three demographic categories: males 18 to 34 years old, males 35 to 49 years old, and all others. Among these three groups, the greatest degree of racial tolerance is displayed by the young males, only 36% of whom agree with the statement above. Middle-age males and

[21]See, for example, Greeley (1975); Taylor *et al.* (1978); Wilson (1986); Tuch (1987); Firebaugh & Davis (1988); Fossett & Kiecolt (1989). The relative lack of more recent papers using this survey question reflects the fact that it was omitted from the GSS between 1985 and 1994.

[22]The GSS is a probability sample of the entire nation, thus sample weights are normally not necessary. This does imply, however, that the sample of black respondents is considerably smaller than the sample of white respondents.

all others agree with the statement at rates of 40% and 42%, respectively.[23] The finding of a larger black quarterback effect among young males is thus consistent with the greater racial tolerance, and by extension stronger tastes for diversity, expressed by young white males in the GSS.

The second tabulation in Table 8 examines differences in racial attitudes within the black population. Here, we interpret disagreement with the GSS questionnaire statement not as evidence of racial intolerance, but as evidence of a belief in the importance of racial advancement. We expect the black quarterback effect to be stronger in segments of the black population that hold stronger beliefs in this regard. Consistent with this expectation, the fraction of black respondents voicing agreement with the statement is lowest among young males, relative to middle-age males and all others.[24] Notably, the magnitude of the difference between young males and other groups is much larger in the black population than in the white population. Thus, evidence on racial attitudes supports both the black own-race and diversity explanations for the black quarterback effect, and indeed suggests that the two effects act in concert.

6 Conclusion

Recent evidence taken from survey instruments such as the GSS consistently show a high degree of racial tolerance and preferences for diversity in the American population. Evidence based on market outcomes, both in the United States and internationally, has more frequently pointed to a different conclusion: that ethnic and racial diversity is a liability rather than an asset for nations, communities and neighborhoods. Divergences such as these underlie much of economists' preference to base conclusions on empirically observed behavior, rather than survey responses. Our paper has shown that the divergence between what people say about race and how they behave may not be so great, at least in certain circumstances. We have shown that the outcome of an economic decision, whether to watch a television broadcast, displays a sensitivity to the race of the leading characters in that broadcast that is entirely and specifically consistent with patterns of racial attitudes revealed in surveys.

[23]The t-statistics for the sample differences in proportions reveal that young males are statistically significantly different from all others ($t = 2.22$), that young males are statistically distinguishable from middle-aged males only at the 20% level ($t = 1.29$), and that older males are not statistically distinguishable from all others ($t = 0.725$).

[24]The t-statistics for the sample differences show that young males are significantly different from middle-age males and all others ($t = 2.34$ and $t = 2.84$, respectively), and that middle-age males are not distinguishable from all others ($t = 0.315$).

The results presented here show that white racial tolerance and black desires for racial advancement are significantly stronger in younger age cohorts. These patterns, documented in the GSS data, appear to translate directly into the economic behavior we analyze. An optimistic conclusion to draw from these results is that the generational shift in stated racial attitudes, corroborated by observed market choices, presages a new equilibrium in race relations and associated behavior. The negative impact associated with racial diversity in so much of the recent literature may dissipate as older, less tolerant cohorts are replaced as the individuals driving market outcomes and collective decisions. Recent declines in residential segregation provide additional evidence to support this view (Cutler *et al.* , 1999).

A more pessimistic conclusion would be that the black quarterback effect shows that whites are quite willing to allow blacks into their living rooms so long as they remain confined to the television screen. Indeed, white preferences for entertainment services provided by African-Americans have a long history in the United States. Further research, and further experience, will be required in order to determine whether diversity effects observed in market outcomes converge to the preferences stated by survey respondents.

References

Alesina, A., & La Ferrara, E. 2000. Participation in Heterogeneous Communities. *Quarterly Journal of Economics*, **115**, 847–904.

Alesina, A., & La Ferrara, E. 2002. Who Trusts Others? *Journal of Public Economics*, **85**, 207–234.

Alesina, A., Baqir, R., & Easterly, W. 1999. Public Goods and Ethnic Divisions. *Quarterly Journal of Economics*, **114**, 1243–84.

Bayer, P., McMillan, R., & Rueben, K. 2004. An Equilibrium Model of Sorting in an Urban Housing Market. *NBER Working Paper #10865*.

Becker, G.M. 1957. *The Economics of Discrimination*. Chicago: University of Chicago Press.

Carney, S., & Fenn, A.J. 2004. The Determinants of NFL Viewership: Evidence from Nielsen Ratings. *Colorado College Economics and Business Working Paper No. 2004-02*.

Cutler, D.M., Glaeser, E.L., & Vigdor, J.L. 1999. The Rise and Decline of the American Ghetto. *Journal of Political Economy*, **107**, 455–506.

Dey, M.S. 1997. Racial Differences in National Basketball Association Players' Salaries: A New Look. *American Economist*, **41**, 84–90.

Easterly, W., & Levine, R. 1997. Africa's Growth Tragedy: Policies and Ethnic Divisions. *Quarterly Journal of Economics*, **112**, 1203–1250.

Entman, R.M., & Rojecki, A. 2001. *The Black Image in the White Mind: Media and Race in America*. Chicago: University of Chicago Press.

Firebaugh, G., & Davis, K.E. 1988. Trends in Antiblack Prejudice, 1972-1984: Region and Cohort Effects. *American Journal of Sociology*, **94**, 251–272.

Fossett, M.A., & Kiecolt, K.J. 1989. The Relative Size of Minority Populations and White Racial Attitudes. *Social Science Quarterly*, **70**, 820–835.

George, L.M., & Waldfogel, J. 2003. Who Affects Whom in Daily Newspaper Markets? *Journal of Political Economy*, **111**(4), 765–784.

Greeley, A.M. 1975. Ethnicity and Racial Attitudes: The Case of the Jews and the Poles. *American Journal of Sociology*, **80**, 909–933.

Gugerty, M.K., & Miguel, E. 2005. Ethnic Diversity, Social Sanctions and Public Goods in Kenya. *Journal of Public Economics*, **Forthcoming**.

Hamilton, J.T. 1998. *Channeling Violence: The Economic Market for Violent Television Programming*. Princeton, NJ: Princeton University Press.

Hanssen, F.A, & Andersen, T. 1999. Has Discrimination Lessened over Time? A Test Using Baseball's All-Star Vote. *Economic Inquiry*, **37**(2), 326–352.

Holzer, H.J., & Ihlanfeldt, K.R. 1998. Customer Discrimination and Employment Outcomes for Minority Workers. *Quarterly Journal of Economics*, **113**, 835–67.

Kahn, L. M. 1991. Discrimination in Professional Sports: A Survey of the Literature. *Industrial and Labor Relations Review*, **44**(3), 395–418.

Kahn, L. M., & Sherer, P. D. 1988. Racial Differences in Professional Basketball Players' Compensation. *Journal of Labor Economics*, **6**(1), 40–61.

Kahn, L.M. 2000. The Sports Business as a Labor Market Laboratory. *The Journal of Economic Perspectives*, **14**(3), 75–94.

Kanazawa, M. T., & Funk, J. P. 2001. Racial Discrimination in Professional Basketball: Evidence from the Nielsen Ratings. *Economic Inquiry*, **39**(4), 599–608.

Levy, A.H. 2003. *Tackling Jim Crow: Racial Segregation in Professional Football*. Jefferson, NC: McFarland & Co.

Luttmer, E.F.P. 2001. Group Loyalty and the Taste for Redistribution. *Journal of Political Economy*, **109**(3), 500–528.

Mandese, J. 1999. Prime-Time Pricing Woes. *Advertising Age*, September 20.

McGowan, W. 2001. *Coloring the News: How Crusading for Diversity Has Corrupted American Journalism*. San Francisco: Encounter Books.

Nardinelli, C., & Simon, C. 1990. Customer Racial Discrimination in the Market for Memorabilia: The Case of Baseball. *Quarterly Journal of Economics*, **105**(3), 575–595.

Oberholzer-Gee, F., & Waldfogel, J. 2005. Strength in Numbers: Group Size and Political Mobilization. *Journal of Law and Economics*, **Forthcoming**.

Poterba, J.M. 1997. Demographic Structure and the Political Economy of Public Education. *Journal of Policy Analysis and Management*, **16**, 48–66.

Taylor, D.G., Sheatsley, P.B., & Greeley, A.M. 1978. Attitudes Toward Racial Integration. *Scientific American*, **238**, 42–49.

Tuch, S.A. 1987. Urbanism, Region and Tolerance Revisited: The Case of Racial Prejudice. *American Sociological Review*, **62**, 504–510.

Vigdor, J.L. 2003. Residential Segregation and Preference Misalignment. *Journal of Urban Economics*, **54**(3), 587–609.

Vigdor, J.L. 2004. Community Heterogeneity and Collective Action: Analyzing Initial Mail Response to the 2000 Census. *Review of Economics and Statistics*, **86**(1), 303–312.

Waldfogel, J. 2003a. Preference Externalities: An Empirical Study of Who Benefits Whom in Differentiated Product Markets. *RAND Journal of Economics*, **34**(3), 557–68.

Waldfogel, J. 2003b. Who Benefits Whom in Local Television Markets? *Brookings-Wharton Papers on Urban Affairs*, 257–284.

Wilson, T.C. 1986. Interregional Migration and Racial Attitudes. *Social Forces*, **65**, 177–186.