

## DISCRIMINATION IN PROFESSIONAL SPORTS: A SURVEY OF THE LITERATURE

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This paper reviews studies of racial and ethnic discrimination in professional sports and briefly examines gender differences in pay among professional tennis players. Many of these studies include far more extensive controls for individual ability and performance than typical studies of discrimination that use labor force data. The cited studies show evidence of salary discrimination and customer discrimination against blacks in basketball, and positional segregation on the basis of race or ethnicity in baseball, football, and hockey. More limited evidence is found for the existence of salary discrimination and fan discrimination against French-Canadian hockey players and fan preferences for white baseball players. Finally, at several Grand Slam tennis tournaments, the money prize for the women's winner is somewhat smaller than that for the men's winner, despite some evidence that the women's matches draw at least as much revenue as the men's matches.

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ECONOMISTS and the public at large have become increasingly interested in the issue of discrimination in professional sports. The public perception has to some degree been that sports are an oasis of equal economic opportunity for minorities (Eitzen and Sage 1978). Sports teams are sometimes viewed as being engaged in intensive competition in which participants are evaluated solely on their merits. The belief that sports provide exceptional opportunities for minorities is reinforced by the fact that minority representation is higher in major team sports than in the labor force as a whole. For example, among experienced players in professional basketball in the 1985-86 season, 74.3% were black; in the National Football League in 1988, 56.0% of the players were

black; and in major league baseball in 1987, 27.8% of the players were black.<sup>1</sup> These figures are all substantially larger than the black percentage of the civilian labor force, which was 10.9% in 1988 (USBLS 1989:16, 18).

Furthermore, many of the highest-paid athletes in the United States are black. In the National Basketball Association (NBA), for example, in the 1988-89 season, four of the five players earning salaries of at least \$3 million were black; in major league baseball, of the twelve players making at least \$2 million per year in 1988, four were black and one was Hispanic; and in the National Football League (NFL), roughly half of the 30 players making at least \$1 million for the 1988 season were black.<sup>2</sup>

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<sup>1</sup> These figures were taken from Kahn (1989) (baseball); Kahn and Sherer (1988:49) (basketball); and Staudohar (1989:86) (football).

<sup>2</sup> Salary figures are taken from *The Sporting News*,

Despite this evidence of economic achievement, there is an undercurrent in the public's perception of the treatment of black professional athletes. Until the 1940s, blacks were excluded altogether from professional sports. Although the major sports have integrated since then, in many instances there was militant resistance to allowing blacks to compete (Eitzen and Sage 1978; Okrent and Wulf 1989; Tygiel 1983). Although blacks are now well represented among players in major professional sports, they are rarely found in managerial or executive positions.<sup>3</sup> Further, blacks have relatively low representation in such key positions as quarterback in football and pitcher in baseball. In recently publicized remarks, a team executive claimed that black athletes did not have the qualities necessary to become managers or executives; and a well-known broadcaster was fired for making racist comments (Staudohar 1989:58). Anecdotal evidence documents that many black athletes believe they receive unequal treatment (relative to whites).<sup>4</sup>

The issue of discrimination in sports has increasingly attracted the attention of economists, who have seen professional sports as providing an unusually good opportunity to study the extent of discrimination. Economists have usually defined discrimination as unequal treatment (for example, on the basis of race, gender, or age) of equally productive workers (Becker 1971). A major difficulty in estimating the extent of discrimination is the problem of measuring productivity. In practice, this problem is usually handled by using in wage regressions variables such as education and experience as proxies for productivity.<sup>5</sup> Such variables, however, are likely to measure productivity with error; further, if this error is

correlated with the independent variable of primary interest (such as race or gender), the procedure will lead to biased estimates of discrimination. A particular advantage of professional sports data is that they include extensive, publicly available measures of the performance and compensation of athletes. Although the use of such information may still result in biased estimates of productivity (and therefore possibly of discrimination), such mismeasurement is likely to be much smaller than that caused by the exclusive use of education and experience as measures of productivity.

In addition to allowing for relatively precise measures of productivity, a focus on sports permits us to estimate the extent of forms of discrimination besides that based simply on wages. For example, the availability of data on revenues in sports and the identity of the workers generating those revenues permits an evaluation of customer discrimination. Further, information on the results of the draft in sports allows us to study the issue of hiring standards in a much more precise way than is usually done in the literature on discrimination.

Although the anecdotal evidence already discussed on discrimination in sports is suggestive, we need to know what these stories add up to. Are they isolated incidents or are they symptomatic of general trends and patterns in professional sports? To answer this question, in this review I survey studies of discrimination in sports that use statistical evidence to explore whether discrimination exists with respect to salaries, hiring, positions assigned, or customer preference.<sup>6</sup>

### Forms of Discrimination in Professional Sports

Economists have identified a variety of sources and forms of labor market discrimination, which, as remarked earlier, is

January 2, 1989, pp. 56-65, and January 16, 1989, pp. 32, 52.

<sup>3</sup> In addition, blacks are very rarely represented in such lucrative sports as golf and tennis. See Eitzen and Sage (1978) and U.S. Tennis Association (1989).

<sup>4</sup> See, for example, Halberstam (1981) or Bradley (1976).

<sup>5</sup> See Cain (1986) for a review of studies on discrimination.

<sup>6</sup> These studies were concerned with racial or ethnic discrimination. Below, I review data relevant to the issue of gender discrimination in professional tennis, one sport in which men and women on occasion are paid by the same "employer."

taken to mean unequal treatment of equally qualified workers.<sup>7</sup> It is important to identify possible sources of discrimination in order to analyze the impact of market processes on the persistence of discrimination. Becker (1971) argued that labor market discrimination could result from employer prejudice, co-worker discrimination, or customer preferences.

In the context of sports, employer (owner) prejudice has been cited as an important reason for the exclusion of black players from major league baseball until 1947 (Okrent and Wulf 1989). In addition, even after Jackie Robinson broke the color line in 1947, some teams appeared to be more prejudiced against blacks than others and were reluctant to field teams with minorities (Okrent and Wulf 1989; Gwartney and Haworth 1974). Moreover, Gwartney and Haworth (1974) showed that in the first ten seasons of integrated baseball (1947–56), teams that used more black players had, on average, higher winning percentages than teams that chose not to integrate as fast. The authors argued that this difference in winning performance illustrated the competitive advantage that Becker (1971) maintained non-discriminators would have. Further, we would expect prejudiced teams to trade black players to non-prejudiced teams, or, in the era of free agency, blacks to move directly to non-prejudiced teams. The elimination of pay differentials based on team prejudice, then, depends on the existence of non-prejudiced teams or non-prejudiced potential buyers of teams.<sup>8</sup>

In the case of co-worker discrimination,

<sup>7</sup> Most economists accept this definition of discrimination, but some observers have proposed an alternative definition: the setting of unequal standards in allocating job opportunities or pay levels (Conway and Roberts 1983). This definition is closely related to hiring discrimination, which is discussed below. In addition, there may be discrimination in training opportunities before people enter the labor market. This possibility is also mentioned below.

<sup>8</sup> An exception to this rule has been noted by Goldberg (1982). Specifically, if prejudice takes the form of favoritism toward whites (rather than an aversion to blacks), then discriminators and non-discriminators can coexist.

again taking the example of race, whites require a premium for working with minorities. There was much evidence of co-worker discrimination when Jackie Robinson entered the major leagues:<sup>9</sup> several members of his team (the Brooklyn Dodgers) approached the management to protest his place on the roster; the St. Louis Cardinals reportedly threatened to strike rather than play against him; and one member of the Dodgers asked to be traded rather than play alongside Robinson (a request that was granted). The trade of Robinson's teammate can be seen as an illustration of the segregation mechanism Becker (1971) mentioned as a likely market outcome of co-worker discrimination. Free agency can also lead to a similar allocation of players.

Finally, customer prejudice has a long history in sports. In boxing, for example, the wait for "the great white hope" is legendary. Bill Bradley (1976:204) quotes a reporter's view of racism among white fans in the early 1970s: "Take the ordinary ethnic, white, working stiff. . . . There he sees Frazier, this black . . . who is making \$300,000 a year for playing. . . . Then there he [Frazier] is, playing poorly. . . . I have watched crowds and those boos for Frazier were vicious." Of course, fans' reaction to the introduction of Jackie Robinson was also in many cases highly antagonistic (Tygiel 1983:180–208). Unlike employer or co-worker prejudice, discrimination based on customer prejudice will not be eliminated by market forces, since teams are rewarded for bidding hardest for the players the fans want to see most (Kahn, forthcoming).

Just as discrimination can have several sources, so can it take various forms. Perhaps the simplest form is unequal pay for equal work. For example, Pascal and Rapping (1972) suggest that white rookies in the 1950s received considerably higher signing bonuses than equally qualified blacks. I will survey a wide variety of studies of pay equality.

Discrimination can also take the form of

<sup>9</sup> This discussion is based on Okrent and Wulf (1989) and Tygiel (1983).

unequal hiring standards. As we will see below, several authors have alleged that black athletes face higher performance standards than whites for entry into and retention in professional sports.

An additional form of discrimination that some believe has occurred in sports is positional segregation. Whites have been disproportionately represented at positions such as pitcher and catcher in baseball and quarterback in football. As noted below, authors disagree on the extent to which this kind of segregation represents discrimination. To the extent that it does, however, comparing the salaries of blacks and whites who have performed equally well may understate discrimination.

Further, consideration of endorsement income also suggests that concentrating on salaries may understate discrimination. Specifically, surveys done by sports marketing firms found that in 1987, although eight of the top ten most popular athletes in the United States were black, only one of the top 10 sports endorsers (in terms of income) was black (Lipman 1988:B1).

### Salary Discrimination

Studies of salary discrimination in sports (see Table 1) have used a variety of methodologies to measure the extent of salary discrimination. The most common method is to regress salary (or its log) on a list of productivity indicators and a dummy variable for race.<sup>10</sup> Such a formulation yields an estimate of the market "discrimination coefficient" (Becker 1971)—the coefficient on the race dummy variable.<sup>11</sup> It assumes,

<sup>10</sup> In some of the studies in Table 1, race was broken down into three categories—white, black and Hispanic—necessitating the creation of two dummy variables.

<sup>11</sup> Information on all team salary offers, rather than merely those offers that were accepted, is desirable, since an examination restricted to current players results in a truncated view of the salary offer distribution, which can produce biased estimates of discrimination if the propensity to turn down offers differs by race. In professional sports, however, most players are likely to be earning much higher salaries than they could obtain elsewhere. Thus, barring the influence of injuries or voluntary retirement, truncation is not likely to be an important problem here.

however, that whites and nonwhites receive the same return to higher performance levels and to other variables that influence salary.<sup>12</sup> As can be seen in Table 1, some studies examine this assumption by performing a statistical test for the equality of the (non-slope) coefficients in separate white and black regressions.

As with studies of wage discrimination for the labor force in general, the regression approach to estimating discrimination in sports may lead to biased estimates if the researcher is not able to measure performance accurately. If errors in measuring productivity are (partially) correlated with race, then biased estimates of discrimination will result. As noted, these problems may be less severe in sports than in other industries because we have much better performance data for sports. Nonetheless, the studies in Table 1 use different explanatory variables and may still to some degree suffer from omitted variable biases.

The direction of such biases is not at all clear. From Table 2, we see that studies of baseball, basketball, and football generally find that blacks outperform whites on measured productivity characteristics. If unmeasured productivity moves in the same direction as measured productivity, then the studies in Table 1 will understate the extent of discrimination. On the other hand, if unmeasured performance is negatively correlated with measured performance, then discrimination against blacks will be overestimated.<sup>13</sup>

A final methodological issue in these studies is the sample size. In general, earlier studies, particularly those in basketball, had much smaller sample sizes than more recent studies. A larger sample size justifies more confidence that a study has captured genuine trends and not merely characteristics of the particular sample analyzed.

<sup>12</sup> All of the studies in Table 1 on baseball, football, and basketball deal with race; the studies of hockey deal with possible discrimination against French-Canadians.

<sup>13</sup> For further discussion of the issue of unmeasured productivity and discrimination, see Goldberger (1984).

The studies in Table 1 on baseball show little evidence of salary discrimination against black players. For example, none of the studies that computed discrimination coefficients found a significant negative effect for blacks. In one case (Pascal and Rapping 1972) there was a significant Hispanic shortfall for nonpitchers; in three cases (Christiano 1986, 1988; Pascal and Rapping 1972) there was a significant white shortfall in salary, controlling for measured productivity. In these instances of white salary shortfall, should we conclude that there is discrimination against whites, despite the fact that blacks were barred from major league baseball until 1947? A more likely explanation is omitted variables. For example, Pascal and Rapping (1972) found white salary shortfalls among pitchers for 1968–69; at that time, there were so few black pitchers (Table 2) that those blacks who did pitch likely needed to be especially skilled. Further, although Christiano (1986, 1988) found significant white salary shortfalls in regressions, Kahn (1989), using data similar to those Christiano used in his 1988 study but with a longer list of performance measures, found small, statistically insignificant race differences.

Of the baseball studies in Table 1 that compared black and white equations, some found significant differences in the coefficients, whereas others did not. Several of the early studies in Table 1 found that black players in the 1968–71 period had higher returns to experience than white players. Scully (1974a) interpreted that finding as suggesting that blacks faced retention barriers: black veterans had to outperform whites in order to remain in baseball; to produce the higher black experience effect, such barriers would have to grow with experience. Under such conditions, experienced black players would be a more select group than inexperienced black players, relative to the selection effect for white players. Some limited evidence for this view can be seen in Table 2: Scully (1974a) found that for outfielders, the black performance advantage over whites widens with experience; on the other hand, for infielders, the black

performance advantage peaks at 6–7 years of experience. Using more recent data and a larger sample, however, Christiano (1988) did not find consistent evidence of a higher black wage return to experience. It is possible that experienced black players in the late 1960s had faced greater entry barriers (in the 1950s) than experienced players in the 1980s; experienced black players (especially outfielders such as Willie Mays and Hank Aaron) in 1968 may thus have had particularly high unmeasured ability.

It is especially noteworthy that the pattern of results for salary discrimination for the period before free agency (1976) is similar to the pattern after free agency. If some employers discriminated while others did not, then, Cymrot (1985) has argued, free agency may reduce such discrimination, as black players would move to nondiscriminatory teams.<sup>14</sup> A related hypothesis is that in the era of free agency, if some owners are prejudiced, there will be more salary discrimination against black players not eligible for free agency than against those eligible. This possibility was investigated by Cymrot (1985) and by Christiano (1988).

First, Cymrot (1985) estimated separate log salary regressions by race and by free-agency eligibility status. Chow-tests confirmed that for ineligibles, the coefficients for whites were significantly different from those for nonwhites; however, such tests accepted the null hypothesis that for eligibles, there were no significant differences between white and nonwhite coefficients (including intercept terms). Cymrot (1985) concluded that the competition implied by free agency eliminated the discrimination that presumably would have existed against eligible nonwhites had they not been eligible. Although Cymrot did not compute discrimination coefficients, his results are consistent with the competition hypothesis. Second, Christiano (1988) compared black and

<sup>14</sup> As is discussed below in the context of basketball, even free agency is not sufficient to eliminate racial pay differentials based on customer discrimination.

Table 1. Summary of Studies of Wage Discrimination in Sports.

Study	Sport	Sample	Results
Pascal and Rapping (1972)	Baseball	148 players, 1968-69	Nonpitchers: insignificant negative coefficient for whites, 5-6% of mean salary. Pitchers: significant negative effect for Latins, 42% of mean salary. Outfielders: insignificant (5-10%, 1-tailed) negative coefficient for whites, 13-25% of mean salary. Infielders: insignificant Latin effects, -14% to 11% of mean salary. Pitchers: insignificant black-white differences in returns to experience and productivity. Black returns to productivity and experience generally larger than white returns. No significance tests of differences in black and white coefficients.
Scully (1974a)	Baseball	148 players, 1968-69	Nonpitchers: significantly (5%, 1-tailed) higher black return to experience. Pitchers: significantly (5%, 2-tailed) higher black return to experience.
Mogull (1975)	Baseball	126 players, 1971	Black returns to productivity and experience generally larger than white returns. No significance tests of differences in black and white coefficients.
Medoff (1975)	Baseball	62 nonpitchers, 1968	Insignificant, negative black effect on wage change (magnitude is \$347).
Mogull (1981)	Baseball	54 nonpitchers, 1971	Insignificant result in Chow test for black-white wage equation differences.
Cymrot (1983)	Baseball	80 free agents, 1976-79	Insignificant nonwhite effect on log salary (effect = .02).
Raimondo (1983)	Baseball	146 players, 1977	Returns to performance and experience for nonwhites are similar to those for whites (no significance tests of differences in coefficients).
Hill and Spellman (1984)	Baseball	523 players, 1976	Decomposition analysis of separate black-white regressions. Nonpitchers: 7 percentage point discrimination coefficient against blacks. Pitchers: 5 percentage point discrimination coefficient against whites.
Cymrot (1985)	Baseball	885 players, 1978-80	Free agent eligibles: insignificant result in Chow test for white-nonwhite equation differences. Free agent noneligibles: significant (1-5%) results in Chow tests for white-nonwhite equation differences.
Christiano (1986)	Baseball	212 non-pitchers, 1977	4.6% discrimination coefficient against whites (significant at 10%, 2-tailed).
Christiano (1988)	Baseball	356 non-pitchers, 1987	17.0% discrimination coefficient against whites (significant at 5%, 2-tailed).
Kahn (1989)	Baseball	575 players, 1987	Nonpitchers: insignificant American black and Hispanic black effects on log salary (coefficients less than 1% in magnitude). Pitchers: Insignificant American black and Hispanic black effects on log salary (coefficients -13% to 30% in magnitude).
Rockwood and Asher (1976)	Basketball	28 players, 1970-71	Insignificant discrimination coefficient against blacks (magnitude is \$176).
Mogull (1977)	Basketball	28 players, 1970-71	White equations generally have higher $R^2$ than black equations (no Chow tests).

(Continued)

Table 1. (Continued)

Study	Sport	Sample	Results
Mogull (1981)	Basketball	28 players, 1970-71	Insignificant result in Chow test of black-white equation differences.
Scott, Long and Somppi (1985)	Basketball	26-players, 1980-81	Insignificant race coefficient (magnitude is \$101,096 in favor of whites; mean of sample = \$606,538).
Kahn and Sherer (1988)	Basketball	226 players, 1985-86	Significant (1%, 2-tailed) positive coefficient for whites; magnitude is 21-25%.
Koch and Vander Hill (1988)	Basketball	278 players, 1984-85	Significant (10%, 2-tailed) positive coefficient for whites; magnitude is 11.6%.
Wallace (1988)	Basketball	229 players, 1984-85	Significant (10%, 2-tailed) positive coefficient for whites; magnitude is 18.3%.
Brown, Spiro, and Keenan (1988)	Basketball	227 players, 1984-85	Significant (5%, 2-tailed) negative coefficient for blacks; magnitude is -14.4%.
Mogull (1973)	Football	96 players, 1970-71	Veterans: 4% salary advantage for whites over blacks (no significance test). Rookies: 0.1% salary plus bonus advantage for whites over blacks (no significance test).
Mogull (1981)	Football	64 pro linemen, 1970-71	Insignificant result in Chow test for black-white equation differences.
Grenier and Laviole (1988)	Hockey	279 NHL players, 1977-78	Forwards: insignificant positive coefficient for French-Canadians (magnitude is 4.3% of mean). Defense: significant (5%, 2-tailed) negative coefficient for French-Canadians (magnitude is 14.5% of mean). Goalies: insignificant negative coefficient for French-Canadians (magnitude is 4.9% of mean).
Jones and Walsh (1988)	Hockey	306 NHL players, 1977-78	Forwards: insignificant positive coefficient for Quebec-born players (magnitude is 0.8%). Defense: significant (5%, 2-tailed to 10%, 1-tailed) negative coefficient for Quebec-born players (magnitude is -13.0% to -9.4%). Goalies: insignificant coefficients for Quebec-born players (magnitude is -2.8% to +4.8%).

white log salary coefficients by eligibility status and found no strong patterns.<sup>15</sup>

Christiano's results suggest that it may be premature to say that there is more discrimination against free agency ineligible than against eligibles. Further, one may question the logic behind Cymrot's (1985) prediction. Specifically, even in the absence of free agency, one would expect prejudiced owners to trade black players to non-prejudiced teams, leading to an allocation of players similar to what one would find under free agency. The prediction that free agency causes a reduction in racial salary differentials rests on the assumption that free agency allows more player mobility (or potential mobility, through the offer-matching process) than would have occurred through trades alone—a question on which there is no evidence.<sup>16</sup>

In contrast to the studies of baseball, research on professional basketball players' salaries indicates significant black salary shortfalls in the 1980s. Table 1 shows this result for each study that used sample sizes large enough to comprise all or most of the NBA's experienced players. These studies, using data from either the 1984–85 or 1985–86 seasons, found significant discrimination coefficients ranging from 11% to 25% against black players.<sup>17</sup> Such results are noteworthy since basketball, like baseball, has had free agency since the 1970s (Staudohar 1989: 120).<sup>18</sup> On the other hand, Kahn and

Sherer (1988) accepted the null hypothesis of equal regression coefficients (other than the intercept) for black and white players.

Unlike baseball or basketball, for many positions in football and for defense in hockey, detailed performance measures are not available. Perhaps not surprisingly, I found only two studies of salary discrimination in football (see Table 1), both for the 1970–71 period. In neither case was a discrimination coefficient calculated. Mean salary differences by race, however, were not large (0.1% to 4% in favor of whites, with no significance tests); further, Chow tests did not find significant differences between black and white salary equations (Mogull 1981). With the advent of better salary data and improved performance measures, estimating the extent of discrimination in football salaries is clearly on the research agenda. But for the 1970–71 period, there is little evidence of salary discrimination against black players.

Whereas studies of discrimination in the major American sports have focused on race, several studies of North American professional hockey have investigated discrimination against French-Canadians.<sup>19</sup> Some observers have alleged that French-Canadian players are plagued by negative stereotypes, such as the supposition that they are reluctant to fight (evidently a major component of "good" hockey), are too offense-oriented, and do not work hard enough (Lavoie 1989:20). Such stereotypes can be overcome by observing

<sup>15</sup> Christiano did not perform significance tests for differences in these coefficients.

<sup>16</sup> In some conditions, Nash bargaining under the reserve clause can lead to apparently discriminatory pay gaps that would disappear under free agency. Specifically, if blacks have lower "status quo" income than whites (for example, from endorsements), then Nash bargaining will leave blacks with lower salaries than equally performing whites, even if owners are not prejudiced (Binmore, Rubinstein, and Wolinsky 1986). If we control for status quo income, however, there should be no race effect. Under free agency, players get their marginal revenue products regardless of their status quo incomes.

<sup>17</sup> Earlier studies surveyed in Table 1 on basketball were inconclusive but used samples of only 26–28 players.

<sup>18</sup> Although these studies all used a long list of explanatory variables, they may still suffer from

omitted variable problems. One technique for dealing with such problems, suggested by Conway and Roberts (1983), is to regress qualifications on (log) salary and race—the "reverse regression" technique. Goldberger (1984), however, has argued that such a technique is no less likely to give a biased estimate of discrimination than the usual ("direct") salary regression. Nonetheless, when the reverse regression technique was used by Kahn and Sherer (1988) as an additional check on their basic results, the implied discrimination coefficients were still significant and actually larger in magnitude than those obtained by the direct regression.

<sup>19</sup> Roughly 80% of National Hockey League (NHL) players in 1984 were Canadian (Lavoie, Grenier, and Coulombe 1987:417).

individual playing performance; but performance, according to Grenier and Lavoie (1988), is more easily observable for the positions of goaltender and forward, for which the individual's outputs are shots stopped and goals (or assists), respectively, than for the position of defenseman. Those who have studied salary discrimination in the NHL have found significant discrimination coefficients against French-Canadians only at the position of defense (Grenier and Lavoie 1988; Jones and Walsh 1988), and Grenier and Lavoie argue that such a finding of discrimination is due to the inherent difficulties in measuring performance of defensemen. Specifically, one would expect employer prejudice to have a greater role in salary determination for defensemen than for players in positions for which good, objective measures of performance are available.

In fact, though Grenier and Lavoie (1988) and Jones and Walsh (1988) do not mention this connection, their results are consistent with Aigner and Cain's (1977) model of statistical discrimination. In that model, employers pay workers according to productivity predictions that are based in part on observed qualifications and in part on the employer's prior beliefs. Groups for which performance is less reliably predicted or for which the employer has negative prior beliefs will get lower pay for a given level of qualifications. French-Canadian defensemen may suffer from either type of discrimination. The statistical discrimination model is less relevant for goaltenders and forwards, since their performance can be easily measured; employers need not rely so heavily on prior beliefs to evaluate and reward such players.<sup>20</sup>

<sup>20</sup> Although there may be other explanations of the French-Canadian salary shortfall (such as language barriers or differing reservation wages), these other hypotheses do not explain why the shortfall is concentrated among defensemen (Lavoie 1989). The statistical discrimination argument and the assumption that performance is harder to measure for defensemen together can explain the observed results.

### Hiring Discrimination

Because black athletes were virtually barred from participation in major professional sports until after World War II, it is not surprising that many researchers have examined the issue of hiring discrimination (see Table 2). One plausible definition of hiring discrimination is unequal job offer probabilities facing different applicants with the same ability.<sup>21</sup>

To evaluate the extent of hiring discrimination in professional sports, we need information on players in the hiring pool. That is, we need to know if black players at the margin of acceptance or rejection by the sport face tougher admission standards than whites. Several studies examine this issue.

First, Kahn and Sherer (1988), using 1985–86 data, found no significant racial differentials in the order in which NBA players were drafted, controlling for college performance. In fact, all else equal, black players were drafted slightly (and, as noted, insignificantly) earlier than whites. Although this study did not look at those rejected from the NBA, it does not provide any evidence of hiring barriers. Second, Brown, Spiro, and Keenan (1988) compared the performance in the 1984–85 season of black and white “benchwarmers” in the NBA. The authors found generally insignificant performance differences for these groups, although for the league as a whole, blacks outperformed whites.<sup>22</sup> These results again suggest the absence of hiring barriers at the margin of entry into the league, although joint tests

<sup>21</sup> Overlooked by this definition is the possibility that some black workers (for example) are discouraged from applying for employment by anticipated discrimination. Courts in discrimination cases have taken account of this phenomenon by requiring firms to hire minorities (or women) in proportion to their availability in the relevant labor market (Flanagan, Kahn, Smith, and Ehrenberg 1989). Researchers investigating discrimination in professional sports do not even have data on rejected applicants, much less on the relevant hiring pool (which would presumably include discouraged applicants).

<sup>22</sup> As can be seen from Table 2, other studies of the NBA also found that, overall, blacks outperformed whites.

Table 2. Summary of Studies of Hiring Discrimination in Sports.

Study	Sport	Sample	Results
Pascal and Rapping (1972)	Baseball	429 non-pitchers, 1968	At each position, blacks have higher batting average than whites, significant (5%, one-tailed) in 6 of 12 cases.
Scully (1974a)	Baseball	148 players, 1968-69	Outfielders: black performance advantage over whites widens with experience. Infielders: blacks outperform whites at all experience levels; differential peaks at 6-7 years. All positions: black performance advantage negatively correlated with black representation.
Gwartney and Haworth (1974)	Baseball	Team data, 1950-55; individual player data, 1950 and 1955	Teams with more black players on average have higher winning percentages; at each position, blacks have higher slugging averages than whites.
Medoff (1975)	Baseball	174 non-pitchers, 1967	National League nonwhites significantly outperform whites and American League nonwhites; accept null hypothesis that American League whites and nonwhites have equal productivity.
Hill and Spellman (1984)	Baseball	516 players, 1976	Blacks outperform whites in 4 of 6 positions; differences generally not significant.
Jobu (1988)	Baseball	1,113 non-pitchers, 1971-1985	Controlling for performance, blacks have a significantly higher (hazard) rate of exit from baseball than whites; Hispanics' hazard rate, controlling for performance, is insignificantly different from whites'.
Johnson and Marple (1973)	Basketball	337 pro and 2,254 college players, 1970-71	Black players outscore white players; marginal white pro players have longer careers than marginal black players.
Scully (1973)	Basketball	ABA and NBA players, 1971-72	Blacks have significantly higher points scored per minute of play than whites; blacks also outrebound whites, but the difference is sometimes not significant.
Kahn and Sherer (1988)	Basketball	226 NBA players, 1985-86	At the same salary, blacks significantly outperform whites; however, controlling for college performance, there are no significant race differences in the order in which players are drafted by NBA teams.
Brown, Spiro, and Keenan (1988)	Basketball	227 NBA players, 1984-85	Black benchwarmers generally have insignificantly better performance than white benchwarmers; for all players, blacks generally significantly outperform whites.
Scully (1973)	Football	1971 Pro running backs and wide receivers	Blacks outperform whites in all performance categories; difference is significant 10 out of 12 times.

(Continued)

Table 2. (Continued)

Study	Sport	Sample	Results
Lavoie, Grenier, and Coulombe (1987); Grenier and Lavoie (1988)	Hockey	273 NHL players, 1982-84; 317 NHL players, 1975-77	Francophones outperform Anglophones at forward and defense; Francophone performance advantage is inversely correlated with proportion of players at the position who were French-Canadian.
Lavoie, Grenier, and Coulombe (1987)	Hockey	362 NHL players, 1982-84	At the same draft number, Francophones significantly outperform Anglophones in the NHL.

of differences in individual performance indicators would have provided a perhaps fairer test. On the other hand, Johnson and Marple (1973) found for the 1960–71 period that marginal white pro players had longer careers than marginal black players, suggesting that the latter faced retention barriers.<sup>23</sup>

In hockey, researchers claim to have uncovered evidence of hiring discrimination against French-Canadians (Table 2). For example, Lavoie, Grenier, and Coulombe (1987) found that at the same draft number, Francophones significantly outperformed Anglophones in the NHL in the 1982–84 seasons. This result suggests that French-Canadians need to be better qualified than English-Canadians in order to be selected as early in the draft. Further, the authors (and Grenier and Lavoie 1988, a related paper) also found that Francophones outperformed Anglophones at forward and defense. The French-Canadian performance advantage by position is inversely correlated with the French-Canadian representation by position. This pattern suggests particular barriers to French-Canadian access to the defensive position, where Francophones' representation is the least and their performance advantage is the greatest. (Recall from Table 1 that defense was the only position in which there was a significant French-Canadian salary shortfall.) Confidence in such a test would be strengthened by examining draft-performance relationships by position as well as by studying players rejected by the NHL.

Unlike these studies, which examine the selection process, most research on hiring discrimination in professional sports merely compares black and white performance levels (Table 2). A finding that blacks outperform whites is taken to be evidence of hiring barriers. Since many players are likely to be inframarginal with respect to playing ability, however, such studies do not provide direct evidence on

hiring barriers. If, say, the best black outfielder is better than the best white outfielder, can we say that the former faced entry barriers?<sup>24</sup> There usually are many more marginal players than stars, suggesting that teams do have substitution possibilities at the margin. An implication of the presence of barriers is that teams are hiring lower-quality whites even though there are more highly qualified blacks who are attempting to gain entry. Despite this methodological difficulty with using overall performance comparisons, such studies have yielded some interesting insights.

As noted, in all the major U.S. professional sports, there were racial barriers to entry until after World War II. The purpose of many of the studies in Table 2 was to determine the degree to which these barriers had eroded. The early studies of baseball, based on data from the 1950s and 1960s, indicated important performance differentials in favor of blacks.

One interesting pattern shown by those studies, however (noticed by Medoff [1975]), was that although black National Leaguers significantly outperformed whites, in the American League there were no significant racial performance differences. Since the National League integrated before the American League in the 1940s and 1950s and took advantage of the accumulated black playing talent previously barred from the major leagues, Medoff (1975) argued that the American League was the appropriate setting in which to examine barriers in the 1960s.<sup>25</sup> The lack of a performance differential in the American League indicated to him a lack of hiring barriers. One must use caution in interpreting his findings, since there were only 26 nonwhites in his American League sample.

<sup>24</sup> Of course, other information could indicate hiring discrimination against such a player; here, however, we are concerned with the interpretation of performance differentials.

<sup>25</sup> That is, the black performance differential in the 1960s reflected the talents of the black players brought in during the early period of integration, not the hiring standards current at the time.

<sup>23</sup> Mobility may be voluntary (in the case of some retirements), but considering the high incomes earned by professional athletes, it seems likely that much turnover among them is involuntary.

By 1976, racial performance differentials were less noticeable in baseball, as Hill and Spellman (1984) found that blacks outperformed whites in four of six positions but that these differences were generally not significant. A joint significance test of such differences, however, would have been informative.

Whereas these studies were concerned with entry barriers in baseball, Jiobu (1988) studied retention barriers. Using a sample of 1,113 players from 1971 to 1985, he found that, given the same performance level, position, and age at entry, blacks had a significantly higher exit rate from baseball than whites—a result similar to Johnson and Marple's (1973) finding for benchwarmers in basketball (see above). Hispanic-white differences were small and insignificant. Jiobu, reasoning that baseball players' high salaries should make them unlikely to quit (unless injured), argued that the racial difference in exit was tantamount to a higher discharge rate for blacks, all else equal. Further, since whites are likely to have better non-baseball opportunities than blacks, one might expect, absent salary discrimination, to find earlier retirement rates among white players. Although Jiobu's finding assumes no differences in injuries, it does suggest that teams are more likely to retain an aging white player than an aging black player. If players' skills deteriorate near the end of their careers (Kahn 1989), then the racial difference in exit rates could, by itself, yield an average performance advantage in favor of black players. Again, one must use caution in interpreting performance differentials.

### Positional Segregation

Related to entry barriers is segregation by position. Table 3 summarizes the results found in studies of positional segregation. In baseball, there is evidence that blacks are underrepresented at pitcher, catcher, and infield positions (other than first base).<sup>26</sup> In basketball the

evidence is less strong, although in the 1980s blacks appear to have been slightly overrepresented at guard. In football, blacks in the 1960s and 1970s were underrepresented at quarterback, kicker, and linebacker positions; evidence for more recent years is not available. Finally, in hockey, French-Canadians in the 1970s and 1980s were underrepresented at defense and overrepresented at goalie.

Although researchers do not question the existence of positional segregation in baseball and football, its explanation has been the subject of some debate. On the one hand, some have argued that in these sports, blacks are kept out of positions involving leadership and critical thinking.<sup>27</sup> This exclusion is, according to this argument, based on negative stereotypes about black players' intelligence or leadership abilities. It is also consistent with the existence of co-worker discrimination: white players may resist taking orders from black players. Baseball managers and coaches, when they were players, more often played infield than other positions; if black players are excluded from these positions, then they will receive less "training" for managerial jobs than white players. Thus, even if positional segregation did not lead to any salary differentials, it could still adversely affect the careers of black players.

On the other hand, it has also been suggested that black underrepresentation in central positions is the result of discrimination in training opportunities available to young athletes (that is, "pre-labor market" discrimination).<sup>28</sup> According to such an argument, positions such as pitcher, catcher, and infielder in baseball and quarterback, linebacker, and kicker in football require more training and equipment than other positions. Inequality in training resources provided by schools can lead blacks to choose non-central positions.

sentation at second base and shortstop for 1976 (Table 3).

<sup>27</sup> See, for example, Scully (1974a), Curtis and Loy (1978), Eitzen and Sanford (1975), or Yetman (1987).

<sup>28</sup> See Medoff (1986).

<sup>26</sup> One exception to this generalization is Hill and Spellman (1984), who found slight black overrepre-

Table 3. Summary of Studies of Positional Segregation in Sports.

Study	Sport	Sample	Results
Pascal and Rapping (1972)	Baseball	784 players, 1968	Blacks underrepresented at pitcher and catcher; blacks overrepresented at outfield and first base.
Scully (1974a)	Baseball	Players, 1960-71	Blacks overrepresented at outfield, underrepresented at infield.
Hill and Spellman (1984)	Baseball	516 players, 1976	Blacks underrepresented at pitcher and catcher, overrepresented at outfield, first base, second base, and shortstop.
Medoff (1986)	Baseball	Players, 1970 and 1984	Black representation is lowest for positions with highest training and equipment costs; as black access to training rises, so does their representation in these positions.
Christiano (1988)	Baseball	356 non-pitchers, 1987	Blacks overrepresented at outfield, underrepresented at infield and catcher.
Curtis and Loy (1978)	Basketball	Review of studies done on college and pro players, 1970-71 and 1974-75	No stacking pattern on pro teams; blacks underrepresented at center and guard in college, 1970-71; no college stacking pattern, 1974-75.
Kahn and Sherer (1988)	Basketball	226 NBA players, 1985-86	Blacks underrepresented at center and forward.
Scully (1973)	Football	Pro players, 1971	Blacks overrepresented at defensive back, running back, and wide receiver; underrepresented at quarterback, kicking, linebacker, offensive center, and guard.
Eitzen and Sanford (1975)	Football	Pro players, 1960, 1964, 1968 and 1971	Blacks overrepresented at defensive back, running back, wide receiver, defensive line; underrepresented at center, kicking, quarterback, and linebacker; noticeable increase in fraction of black linebackers and white receivers, 1960-71.
Madison and Landers (1976)	Football	563 pro players, no date specified	Blacks more likely than whites to switch from central to non-central positions from college to pro.
Lavoie, Grenier, and Coulombe (1987); Grenier and Lavoie (1988)	Hockey	565 NHL players, 1982-84; 317 NHL players, 1975-77	Francophones underrepresented at defense, overrepresented at goaltender.

At present, there is insufficient evidence to allow us to reject one of these explanations in favor of the other. On the one hand, in basketball in the 1970s there was no evidence of segregation (Curtis and Loy 1978), and in the 1980s blacks were disproportionately represented at guard, the leadership position (Kahn and Sherer 1988). Such evidence is not consistent with the "negative stereotypes" argument. On the other hand, Madison and Landers (1976) found that in the transition from college to professional football, black players were more likely than whites to switch from central to non-central positions. This finding suggests some tracking on the part of professional football teams, although it could also be explained by the training costs hypothesis. In any event, in the 1980s, black representation at positions such as pitcher in baseball (Medoff 1986) and quarterback in football appears to have been on the increase, although blacks were still underrepresented at these positions as the decade closed.<sup>29</sup>

In hockey, the underrepresentation of Francophones at defense has been taken as additional evidence that team management is unwilling to hire players from this group at a position for which it is difficult to evaluate performance (Lavoie, Grenier, and Coulombe 1987; Grenier and Lavoie 1988). On the other hand, as noted earlier, it is apparently easy to evaluate goalies' performance, and this is precisely the position in which French-Canadians are overrepresented (Table 3). An additional explanation of such findings is that defensemen must communicate more frequently with other players, whereas goalies can be loners. It is questionable, however, whether a defenseman must know very much English (Lavoie 1989).

### Customer Discrimination

Testing for the existence of customer discrimination is important since, unlike

employer or co-worker prejudice, competition will not eliminate this form of discrimination within an industry. To the extent that customer prejudice exists, market forces cannot be relied upon to eliminate unequal treatment of black and white athletes.

As Table 4 shows, studies of customer prejudice in sports have been confined to baseball and basketball. In baseball in the 1950s, black players actually raised home attendance, all else equal. Gwartney and Haworth (1974) attributed this finding to the presence of black superstars in the incoming cohort of black players and new black customers attracted by the integration of baseball. By the 1960s, there was evidence that black players significantly lowered team revenue, all else equal (Scully 1974a, 1974b). Presumably these latter findings reflected white fan preferences. By 1976–77, however, there was no evidence that the racial composition of baseball teams had any impact on revenues (Sommers and Quinton 1982). Nardinelli and Simon's (1989) finding that in 1989 white players' baseball cards sold for higher prices than cards for equally qualified blacks is suggestive of racial prejudice among fans. The market for baseball cards, however, may well be different from that for baseball games. As yet, there is no evidence on the impact in the 1980s or 1990s of black baseball players on team revenues or attendance.<sup>30</sup>

In contrast to baseball, in basketball there appears to be evidence of customer discrimination in the 1980s. Although studies based on data for the years 1978–81 and the years 1969–82 did not find evidence that black players lowered revenues or attendance, studies of 1980–86 data did find that attendance was negatively affected by the black players, all else equal (see Table 4). Further, there is

<sup>29</sup> Recently, three starting quarterbacks in the NFL were black (Randall Cunningham, Warren Moon, and Doug Williams), in marked contrast to earlier years (Eitzen and Sanford 1975).

<sup>30</sup> As noted in Table 4, Noll (1974) found that in both baseball and basketball, the higher the percentage of the area's population that was black, the lower the attendance, all else equal. He concluded, however, that this variable was really a proxy for the quality of the neighborhood in which the team's stadium was located rather than evidence of an aversion of white fans to the presence of black fans.

Table 4. Summary of Studies of Customer Discrimination in Sports.

Study	Sport	Sample	Results
Scully (1974a)	Baseball	1967 fan attendance for 57 starting pitchers	Other things equal, black pitchers draw significantly (10%, 2-tailed) fewer fans than white pitchers (magnitude is 8.0% of first-place team's average attendance).
Scully (1974b)	Baseball	Team data, 1968-69, 43 teams	Black players significantly (1%, 2-tailed) lower team revenue (a one percentage point rise in players who were black lowered revenue \$59,000).
Gwartney and Haworth (1974)	Baseball	Teams, 1950-59	Black players raise annual team attendance (significant [5%, 2-tailed] for 1950-59; insignificant for 1950-55); magnitude is 16,000-29,000 fans per additional black player.
Noll (1974)	Baseball	Teams, 1970-71	Higher black population in team's SMSA significantly lowers annual attendance (10%, 2-tailed); replacing one million white residents with one million black residents lowers attendance by 168,000.
Sommers and Quinton (1982)	Baseball	Teams, 1976-77	Black players have insignificant effect on team revenue (magnitude is -\$2,500 per percentage point increase in black players).
Nardinelli and Simon (1989)	Baseball	1989 baseball card prices for 577 cards issued in 1970	Nonpitchers: controlling for performance, black or Hispanic players have significantly (10%, 1-tailed to 5%, 2-tailed) lower baseball card prices; magnitude is -14.2% to -9.8%. Pitchers: controlling for performance, black or Hispanic players have significantly (10%, 1-tailed to 1%, 2-tailed) lower card prices; magnitude is -31.3% to -15.8%.
Noll (1974)	Basketball	1969-71 teams (NBA and ABA)	Higher black population in team's SMSA significantly (1%, 2-tailed) lowers attendance; replacing one million white residents with one million black residents lowers attendance by 6,535.
Vining and Kerrigan (1978)	Basketball	NBA teams, 1964, 1968, 1970-77	Black players not randomly distributed across teams; significance level 5% in 5 of 10 years.
Scott, Long, and Somppi (1985)	Basketball	NBA teams, 1978-81	Black players significantly raise revenue (1%, 2-tailed); magnitude is \$4,300 for each percentage point increase in black representation.
Schollaert and Smith (1987)	Basketball	NBA teams, 1969-82	Black players have insignificant effects on attendance; beta coefficients range from -.086 to +.077.
Kahn and Sherer (1968)	Basketball	NBA teams, 1980-86	White players raise attendance (insignificant to significant at 2%, 2-tailed tests); replacing a black with a white player raises attendance by 5,700 to 13,000 fans per year.
Koch and Vander Hill (1988)	Basketball	NBA teams, 1984-85	Simple correlation between percent of team that is white and percent of population in team's area that is black is -.19, significant at 1%.

(Continued)

Table 4. (Continued)

Study	Sport	Sample	Results
Brown, Spiro, and Keenan (1988)	Basketball	NBA teams, 1983-84	Percent of playing time played by blacks has insignificant, negative effect on attendance; magnitude is 8,400 fans lost by replacing one full-time white with one full-time black player.
Brown, Spiro, and Keenan (1988)	Basketball	NBA teams, 1988	Percent black players on three most "white" teams is significantly different (1%-3% level) from that on three most "black" teams.
Burdekin and Idson (1988)	Basketball	NBA teams, 1980-86	(a) Percent of white SMSA population has significant (1%, 2-tailed) positive effect on black representation on team. (b) Closeness of racial match between team and SMSA significantly (5%, 2-tailed) positively affects attendance.

evidence from the 1980s (as well as 1964–77) that the racial composition of NBA teams was significantly affected by the racial composition of the areas in which they were located. These latter results suggest the presence of customer prejudice and a response by NBA teams to such prejudice. In addition, the closeness of the racial match between the team and the area positively affects attendance (Burdekin and Idson 1988).

The share of NBA players who are black rose from roughly 58% in 1970–71 (Johnson and Marple 1973:11) to about 74% in 1985–86 (Kahn and Sherer 1988: 49). As white players became more scarce, it is possible that white fans grew more responsive to the presence of additional white players. That is, prejudiced white fans' utility may depend on both winning and the presence of white players; further, the existence of diminishing marginal returns in such utility functions would explain the greater evidence of customer discrimination in the 1980s than in the 1970s.

Although Jones and Walsh (1988:602) did not perform a direct test of customer discrimination, their examination of the salaries of French-Canadian defensemen in hockey has some implications for the issue. In particular, they found a significant salary shortfall for Francophone defensemen playing outside of Quebec, *ceteris paribus*; for those in Quebec, the effect of French-Canadian extraction on salary was positive and insignificant. A plausible explanation of these results is the greater fan identification with French-Canadians in Quebec than in other provinces. Further, it seems likely that French-Canadians might, in the absence of customer discrimination, require a compensating differential to play outside Quebec; if they do, then the above interpretation of Jones and Walsh's (1988) finding is strengthened. Unfortunately, the authors do not conduct such tests for other positions.

### Gender Discrimination in Professional Sports: The Case of Tennis

Unlike black and white athletes, male and female athletes seldom work for the same employer in professional sports. Thus, there are few opportunities in sports to study the issue of gender discrimination.<sup>31</sup> The one notable exception is tennis.

For most of the year, male and female professional tennis players compete in separate events on their own tours, as in golf and bowling. These tournaments have their own sponsors, and players are paid prize money that presumably reflects the revenue raised by the event. Although data on such revenues would be of interest in assessing the extent of customer preferences for men's and women's tennis, they would tell us nothing about the treatment of male and female tennis players by the same employer.<sup>32</sup> At the Grand Slam tournaments (Australian Open, French Open, Wimbledon, and U.S. Open), however, men's and women's draws are part of the same overall event; further, men and women are paid by the same employer in these championships.<sup>33</sup> These tournaments accept the same number of male and female players into each draw (128). Some indication of the treatment of female tennis players can be obtained by examining the evolution of prize money allocation.

The era of open tennis began in 1968, when professionals were first allowed to

<sup>31</sup> There are no major women's professional sports leagues on the scale of the major men's U.S. sports. On the collegiate level, it has been alleged that female athletics budgets have been shortchanged, although there have been no systematic studies of this issue (Eitzen and Sage 1978).

<sup>32</sup> Below, I review some limited data on the television ratings of men's and women's tennis. I take "employer" to mean the body that sets prize money for a given tournament in which there are both men's and women's events.

<sup>33</sup> The Lipton tournament, a less prestigious event, has the same format as the Grand Slam championships. In addition, World Team Tennis involves team competition in which men and women play for each team.

compete at the major tournaments.<sup>34</sup> For the first several years of open tennis, there was a well-developed men's tour (World Championship of Tennis) but no corresponding organization for women. In addition, the total prize money available to men was about ten times that for women (Koster 1976:16). In 1971, women created their own tour (Virginia Slims), which greatly increased the prize money available to women. As of 1972, however, the winner's prize money for the U.S. Open was \$25,000 for men and only \$10,000 for women (*World Tennis*, November 1972, p. 98).<sup>35</sup> Billie Jean King, the women's U.S. Open champion for 1972, threatened to lead a boycott of the tournament in 1973 unless prize money was equalized for men and women. This threat was evidently successful, as men's and women's prizes for the U.S. Open have been equal since 1973 (*World Tennis*, November 1973, p. 22).

Table 5 shows men's and women's winners' prize money figures for selected major championships for 1987-90. There was approximate earnings parity for the Australian Open and, as mentioned, parity for the U.S. Open; for Wimbledon, however, there was an 11% pay gap in favor of men, and for the French Open there was a 10-26% gap for 1987 and 1989-90, with parity in 1988. Taken together, these figures provide some evidence of a gender-related pay gap.<sup>36</sup>

To interpret these data as evidence of discrimination, however, we need to know whether the numbers in Table 5 show unequal pay for equal work. Although men's matches take longer than women's

(three out of five sets as opposed to two out of three sets), the relevant concept for measuring equal work is the entertainment value provided by the players.<sup>37</sup> Although there are no systematic data on revenue produced by tennis players, some indications of their market value can be obtained by examining television ratings.

In the mid-1970s, a CBS television producer associated with tennis events claimed that women's tennis drew better television ratings than men's, in part because the women's tour was better organized than the men's tour (Koster 1976:190). Obtaining evidence of relative ratings at a given event is difficult because men's and women's rounds are often televised on the same day, and the ratings are not broken down for times within a given broadcast. In 1988, however, the Wimbledon men's and women's finals were televised on consecutive days over the July 4<sup>th</sup> weekend. According to a representative of the A.C. Nielsen Company (a firm that computes television ratings), the women's final drew 4.4% of households with televisions, whereas the men's final drew 3.2%.

It is possible that other factors, such as rain delays or audience differences between Saturday and Sunday, may have accounted for this difference in ratings; however, this piece of evidence and the observations of the CBS producer in the 1970s certainly do not suggest that women's tennis at the top level produces any less revenue than men's tennis. We thus cannot rule out discrimination as a cause of the prize money differentials in Table 5. Further, if women generate more revenue than men, then pay equality will still mean discrimination against women. On the other hand, the ratings figures cited above are for the top-rated players. We have no direct information on the market value of the "average" tennis professional. In 1989, 85 men and 34 women each earned over \$100,000 in prize money (U.S. Tennis Association 1990:71). Since the men's and women's

<sup>34</sup> This description of the development of open tennis is based on Koster (1976).

<sup>35</sup> Prize money in tennis for making it to the finals or to earlier rounds is generally roughly proportional to the winner's share. Thus, the 1972 gender differential for winners' shares is likely to be a good approximation for the differential in overall prize money for the tournament.

<sup>36</sup> The Italian Open, another important tournament, schedules its men's and women's championships one week apart. The winner's share in 1989 for men was \$179,200, whereas the winner of the women's draw earned only \$60,000 (*World Tennis*, August 1989, pp. 70-71).

<sup>37</sup> In fact, the length of some men's matches may detract from their entertainment value.

Table 5. Winner's Prize Money, Selected Grand Slam Tennis Tournaments, 1987-1990.

<i>Year and Tournament</i>	<i>First Prize for Men</i>	<i>First Prize for Women</i>	<i>First Prize Ratio (Men/Women)</i>
1990			
Australian Open	\$200,000	\$190,000	1.053
French Open	370,000	293,000	1.263
Wimbledon	411,240	370,116	1.111
U.S. Open	350,000	350,000	1.000
1989			
Australian Open	140,000	135,000	1.037
French Open	291,752	257,379	1.134
Wimbledon	330,624	298,000	1.109
U.S. Open	300,000	300,000	1.000
1988			
Australian Open	105,000	110,000	0.955
French Open	246,750	246,361	1.002
Wimbledon	272,500	245,025	1.112
U.S. Open	275,000	275,000	1.000
1987			
French Open	198,665	179,700	1.106
Wimbledon	252,650	227,385	1.111
U.S. Open	250,000	250,000	1.000

Sources: 1990 Australian Open—*Sports Illustrated*, February 5, 1990, p. 86; 1990 French Open—*Sports Illustrated*, June 18, 1990, p. 88; 1990 Wimbledon—*Sports Illustrated*, July 16, 1990, p. 97; 1990 U.S. Open—Martz (1990:54) and Bonk (1990:C18); 1989 Wimbledon and U.S. Open—U.S. Tennis Association (1990:87); 1989 Australian Open—*Sports Illustrated*, February 6, 1989, p. 69; 1989 French Open—*World Tennis*, August 1989, pp. 70-71; 1988 Australian Open—*Sports Illustrated*, February 1, 1988, p. 77; 1988 French Open, 1987-88 Wimbledon, and U.S. Open—U.S. Tennis Association (1989), p. 81; 1987 French Open—U.S. Tennis Association (1988), p. 77.

tours are separate, the overall difference in aggregate prize money is likely to reflect the relative sizes of the markets for men's and women's tennis rather than unequal treatment by the same employer. Although there may be some discrimination against the top-rated female players, it is not yet possible to say whether there is discrimination against average players.

### Conclusions

This review has uncovered varying patterns of evidence on discrimination in professional sports. Currently, there is little evidence of salary or hiring discrimination by major league baseball. Consistent with these findings for baseball salaries, there is no evidence that customer discrimination has affected team revenues since the introduction of free agency, although it has affected baseball card prices. Finally, there are unexplained racial differences in career length and

persistent, though slowly falling, segregation by position. Both of these phenomena help explain the low incidence of black managers, although the evidence is not clear on whether positional segregation reflects team discrimination, pre-labor market discrimination, or occupational choice.

In contrast to baseball, in basketball there is consistent evidence of salary discrimination as well as customer prejudice, and it is likely that the two are linked: because of fans' preference for white players, the percentage of white players on a team positively affects the team's ticket sales, and white players may consequently be paid more than black players with the same record of performance. The fact that black athletes make up a higher proportion of the NBA's players than of the players in other professional sports may explain the large impact on NBA game attendance of additional white players.

The limited evidence on football shows persistent segregation by position. This segregation may well have salary consequences, but it is not yet clear to what degree it is a demand-side or a supply-side factor.

In hockey, there is evidence that French-Canadians are subject to salary discrimination at the defense position, hiring discrimination, and positional segregation. Further, this evidence supports models of statistical discrimination in which employers use preconceptions to assess the productivity of various groups in jobs for which performance is hard to measure. The salaries of French-Canadian defensemen appear to be higher (relative to others' salaries) inside Quebec than outside it, a finding that supports the notion of customer discrimination. On the other hand, the lack of good performance measures at the defense position could also mean that the French-Canadian salary shortfall there is due to omitted variables.

Finally, top-rated female professional tennis players at some of the major tournaments are faced with a slight pay shortfall that seems to reflect discriminatory treatment. Because of the uniqueness of these tournaments, one might not expect market forces alone to eliminate this shortfall.

Most economic analyses predict an end to discriminatory pay differentials that are based on employer or co-worker prejudice, as long as there are some non-prejudiced employers either in the market or free to enter the market. Such differentials can persist, however, if all employers are prejudiced, or if some have a positive preference for whites (Goldberg 1982), or if there is customer discrimination.

The strongest evidence for the existence of salary discrimination in team sports in recent years is that for hockey and basketball. There is also evidence of customer prejudice in those two sports. In the absence of information on the degree of positive preference for white players (or, in the case of hockey, French- or English-Canadian players) among team owners, customer discrimination seems to be the most likely cause of the salary

discrimination in these sports. Further, for baseball there is no evidence of salary discrimination and no strong evidence of customer discrimination as it affects team revenues. Again, a circumstantial case can be made for the importance of fan prejudice as an explanation for salary differentials when they occur in team sports.

In contrast to baseball, basketball, football, and soccer teams, the major tennis tournaments have no immediate competitors. Thus, if Wimbledon, for example, discriminates against women, its directors' monopsony power can allow employer prejudice to persist for a long time.<sup>38</sup>

The findings cited here on salary discrimination in team sports have for the most part been obtained using far more detailed performance or productivity data than are typically available for the labor force in general. They are thus likely to be much freer of omitted variable biases than estimates of discrimination using standard data bases such as the Current Population Survey. For that reason alone, the studies surveyed here would be of interest to labor economists. In addition, the evidence reviewed here yields some substantive lessons for those interested in issues of race or gender differentials in labor-market outcomes.

First, the consistent evidence of customer preferences for white basketball players has been obtained in the most recent studies of the issue. These racial attitudes among white consumers in the 1980s, as reflected in these studies, may well carry over into other parts of the labor force in which there is contact between producers and customers, such as law, medicine, and a variety of other services. Given the rapid growth of the service sector, there may be ample scope

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<sup>38</sup> Again taking the example of Wimbledon, the tournament committee's need to attract a sufficient number of female players might constrain the degree to which it underpays women. Judging by the competition to get into the tournament, however, it seems unlikely that Wimbledon has driven away its female "applicants."

for such attitudes to adversely affect black workers in the future.<sup>39</sup>

Second, the continued, albeit slowly declining, positional segregation in baseball and football suggests the persistence of negative stereotypes of blacks or unequal access to training facilities. If the latter phenomenon is the explanation, it reminds us that pre-labor market discrimination can still be a powerful force creating racial income differentials, even if there is no evidence of employer discrimination.

Third, the presence of retention barriers facing black athletes in baseball and basketball is reminiscent of the major cause of high unemployment rates for nonwhite men in the United States: a high probability of leaving employment (voluntarily and involuntarily) to become unemployed.<sup>40</sup> Thus, several of the findings reported in this review are consistent with research on the labor force as a whole.

I conclude with some suggestions for further research on discrimination in sports. First, customer discrimination can be investigated in more detail using methods that survey the racial composition of fans. With such information, one could examine the responses of white fans

and nonwhite fans to the race of the players providing entertainment. Second, as yet, little discrimination research has focused on football, due in part to the lack of good performance measures. Such measures should be constructed, and analyses similar to those done for other sports should be attempted. As a setting in which free agency is effectively restricted, football presents an interesting contrast to baseball and basketball (Staudohar 1989; Flanagan 1989). Player mobility under such a system is due to trades, and it would be interesting to know if, as predicted by economic theory, such mobility is sufficient to eliminate discrimination.

Third, co-worker discrimination in sports is a little-explored subject that deserves further study. Fourth, although there are some gender differences in prize money in professional tennis, a systematic study of discrimination in tennis is needed. Such a study could yield interesting international comparisons, since the same players' pay and performance would be evaluated in different countries. Fifth, the low representation of blacks among managers and coaches has not yet been subjected to close scrutiny.

Finally, the relationship between collective bargaining and discrimination in sports has not yet been explored. Collective bargaining is undoubtedly responsible for the advent of free agency. On the other hand, we have no evidence on the impact, if any, of collective bargaining institutions such as salary arbitration or salary caps on racial salary differentials.

<sup>39</sup> For some evidence that customer discrimination has noticeable effects on the economy, see Borjas and Bronars (1989).

<sup>40</sup> See Ehrenberg (1980). There is evidence that among young workers, blacks' quit rates are no different from whites'; blacks' permanent layoff rates, however, are substantially higher than whites'. See Blau and Kahn (1981a, 1981b).

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