

7-20-2012

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Recommended Citation

Kanter, Mark (2012) "Implicit Discrimination in Major League Baseball: Marginality Decisions based on Minor League Offensive Production," *Colgate Academic Review*: Vol. 7, Article 4.
Available at: <http://commons.colgate.edu/car/vol7/iss1/4>

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Implicit Discrimination in Major League Baseball: Marginality Decisions based on Minor League Offensive Production

Mark Kanter, Class of 2010

While Major League Baseball employs a wide variety of races and ethnicities, including white, African-American, Hispanic, and Asian players, it is possible that professional rosters may not be organized based on talent alone. Although studies have shown that salary discrimination is no longer present in Major League Baseball, this paper explores the possibility of a marginality bias in the sport, allowing for whites of comparable ability to non-whites to receive a roster spot due to an implicit bias in managerial and organizational positions. This possibility of marginality is explored within the MLB for the 2009 season by regressing a variable indicating whether a player was called up to a major league team against a player's race and variety of control variables. Results from OLS regressions indicate that on average, neither blacks nor Hispanics must exhibit production numbers superior to whites in order to be "called up" to the major league level. However, it does appear that non-white players perform, on average, to a greater offensive level than their white competitors within the minor league system. While a player's race may not contribute to management's decision to promote them, this study does find a variety of variables that do significantly affect such a decision.

Introduction

Jackie Robinson's debut for the Brooklyn Dodgers in 1947 opened the doors for the addition of non-white players into Major League Baseball. Once this invisible barrier faded, Negro baseball leagues began to function more as a minor league system for African-American players desiring to sign professional contracts, before finally disappearing completely by 1960 (Mills, 2003). While Hispanics made up only 3 percent of MLB rosters in 1950, this representation increased to around 20 percent by 1990 (Gonzalez, 1996). Today, 27 percent of MLB ballplayers are Hispanic, with blacks representing about 10 percent of the league (Lapchick, 2009). Although whites have made up between 58-60 percent of rosters since the late 1990s, there still exists a worry about two

separate phenomena—"centrality" and "marginality". In a 1970 study done by Loy and McElvogue (which focused on professional football), they proposed that whites are more likely to be employed in central positions, such as quarterback, center, and kicker; minorities, they argued, could be found in positions relying not on leadership, but athleticism and instinct, such as running back or receiver.

This same idea of centralization has been applied to baseball. John Phillips defined centrality in his 1980 study as "the tendency to exclude qualified black players from positions which involve interactions with and control of the action of teammates." In 1999, Margolis and Piliavin introduced

this issue to baseball, claiming a disproportionate amount of whites centered in the roles of pitcher and catcher, with blacks usually in one of the three outfield positions. They created a set of control variables (such as size, power, fielding range, speed, and age) to include alongside race, and ran a regression to determine the relationship between race and position centrality. Each position was given a centrality ranking – for example, they determined catchers to have a 1 rating (most central), corner outfielders a 5 rating, and the least central, the designated hitter, a 6. The regression determined that on average, whites exhibit greater centrality over blacks by 1.18 points in the 6-point scale (this result was statistically significant). However, this measure of centrality was an arbitrary number decided upon by the authors, and although they reached a significant conclusion, their results leave little to be expanded upon.

My study also aims to expand on specific research published in 1994 by Lavoie and Leonard, which proposes a separate explanation for discrimination in baseball. Rather than believe that players are moved to specific positions based on their ability to lead (as determined by subconscious discrimination, the aforementioned “centrality” hypothesis), they propose a new “uncertainty hypothesis,” stating that positional segregation occurs most when it becomes difficult to objectively measure performance (Lavoie and Leonard, 1994). Their central concern with the centrality hypothesis is that those positions defined as “central” have been done so “ex post facto” – it is tough

to argue that running backs and centerfielders shouldn’t be considered vital to their respective sports. So, these positions where measuring ability is difficult (which they conclude are positions in which batting is least important) are likely to have a lesser proportion of blacks (they don’t look at Latinos) – essentially, they propose that when managers have no specific criteria, they instead consider race. They claim that catcher, shortstop, and second base are the three positions where batting is least considered. To account for this, this study will use offensive production statistics as independent variables to remove this aspect from the call-up decision, additionally running a regression which considers data for outfielders only.

Similar research by G. Gonzalez (1996) supports the stacking hypothesis for Latino baseball players. The paper objects that position stacking and centrality is solely a black and white race issue, and uses statistics (not a regression) to analyze Latino positioning over time. They find Latino players have been stacked in the positions of second base and shortstop from the period of 1950-1992, but also conclude that this goes against the centrality hypothesis, as these infield positions require “interaction and control” central to the game (Gonzalez, 1996). Yet this still raises a problem – even if centrality is no longer the greatest issue, if black players are disproportionately stacked in the outfield, with Latinos in the middle infield, there is likely to be increased competition with those of the same ethnicity for a select amount of positional openings. If managers are

considering Latino players specifically adept at these roles, it will likely be tougher for an up-and-coming Latino outfielder or pitcher to arrive to the majors in that same position. In my research, I am not looking to consider stacking by position, but rather the issue of roster competition. If certain ethnicities are struggling more than others to reach the majors, this bias should be revealed.

Even if Margolis and Piliavin have shown that blacks are in positions less central to the game, it has been noted that blacks are overrepresented on baseball rosters, experience no salary discrimination, and on average, are more productive than white baseball players (Lavoie and Leonard, 1994).

In *Diamonds in the Rough: The Untold Story of Baseball*, Zoss and Bowman also discuss this idea, looking at data from 1968 that shows an overrepresentation of blacks among the league's top hitters as compared to the average player (1996). However, it seems strange that blacks are more productive than their white counterparts; might this mean that more marginal whites are making it to the majors? What if even more blacks should be participating in MLB, but for some reason, are stuck in the minor leagues?

Although Phillips considered centrality in his study, his greater emphasis focused on marginality, defined as "the tendency to exclude blacks of marginal ability in favor of whites" (1980). Unlike salary data and productivity, measuring marginality becomes a more difficult task. How can

one prove that whites are being selected over more-qualified members of a different race? Phillips relied purely on statistics to analyze the possibility of marginality, comparing batting averages and slugging percentages of whites and blacks for the 20 year period of 1960-1980. He concluded that the practice of marginalization was indeed present for the two decades, with blacks on average having a batting average around 15-25 points higher than whites, and slugging percentages about 40 points higher. Thus, extrapolated out, Phillips concluded that on average, blacks from 1960-1980 would gain about 15 to 25 more hits than whites per 1000 at-bats. He does note that the separation between statistics for the races begins to weaken as the years progress, with a difference of under 10 points by 1980. Although Phillips reports some data on Hispanic ball-players, he states that even in 1980, there were only 37 Hispanic players on professional teams, so he did not wish to derive any type of conclusive evidence specific to them.

Phillips' study has three potential drawbacks. First, his conclusions are drawn only from a variety of statistics, rather than basing them on an actual model. Additionally, his statistics are from players at the professional level, after they have been chosen to compete in MLB as everyday players, thus prohibiting him from looking at how these players ended up in the major leagues. Many players may perform substantially better once out of the minor leagues, and with his study, there is no way to observe why certain players were chosen to compete at this level. Finally, his focus on black players

compared to white is less relevant today, due to the large increase in Hispanic players from 1980 to the present time. However, although the percentage of blacks in MLB may have decreased, a recent vocal presence from a few black major leaguers has brought the issue of race back into consideration. Orlando Hudson, a black infielder still active in the major leagues, claims that due to their race, qualified black free agents are not getting as many quality contract offers as their talent deserves (Passan, 2010). While others argue that it is these players' age, declining ability, and the changing desires of major league management that are to blame for the lack of a suitable contract, Hudson affirms that "there are some things in the game that shouldn't be going on," alluding to racism without explicitly stating the word. Additionally, veteran outfielder Torii Hunter, expressed discouragement that many Hispanic ballplayers are thought by fans to be black, going as far to refer to his Hispanic coworkers as "imposters" (Lacques, 2010). While Hunter's qualm rests with the excessive hiring of Hispanic players, it also indicates that there is an observable amount of discontent within the non-white baseball community. Finally, Milton Bradley's claim from the 2009 season that he was often the victim of racial abuse from the outfield at Wrigley Field suggests that even with complete integration, unobservable factors may exist affecting non-white major leaguers.

My study includes an empirical model employing both black and Hispanic players, and uses offensive production of players at the minor league level, including those who were called up

to the major leagues at some point in the year, as well as those who were not. Each of these additions should provide a better indication of the differences between players of different races and ethnicities.

In my study I am expanding on the research in Major League Baseball surrounding centrality and marginality. Specifically, I compare white players with black players and those of Hispanic background in an effort to determine if non-white minor league players must have offensive skills significantly better than their white competitors in order to be placed on a professional roster. If black and Hispanic players must perform better to be called up to a major league team, this becomes relevant for both players and baseball organizations. Although it would be difficult to prove that preferences for white players were actually being exhibited, this study would allow non-white players to benefit from becoming aware that an implicit discrimination was taking place, with their white counterparts of comparable ability being chosen instead of them. Additionally, if organizations are not choosing players based completely on talent, they are limiting their potential to win, thus not maximizing possible profits for their business. Considering that fans do not care about the racial make-up of their team (Phillips, 1980), there is no reason not to employ those players most likely to improve a team's chances at success.

I use individual player data taken from www.thebaseballcube.com of players from the 2009 MLB season who played on a team's AAA affiliate (each

professional team's most competitive minor league team) at some point throughout the season. I regress a variable indicating whether a player was called up to the major leagues against a variety of offensive production variables, a player's race, and variables measuring a player's age and their personal experience in the major leagues. While I expect to see offensive production highly correlated with a player being called up, the main focus of the regression is to determine if a relationship exists between players entering the majors and their respective race. The results of my OLS regression indicate that black and Hispanic baseball players do not face a significant disadvantage at gaining promotion when compared to their white counterparts. The results suggest that a marginality bias is no longer apparent today, appearing to allow non-white players a similar path to the major leagues.

Data and Variables

The website from which data was obtained contains all MLB team rosters from the 2009 season. By analyzing each roster, players with 50 or more minor league at bats at the AAA level who also obtained 10 or more at bats at the professional level for the 2009 season were included in my data. Pitchers were not included in the sample, as their offensive production is not considered by organizations when determining the best level of baseball in which they should play. Additionally, catchers have been excluded from this study for two reasons. For one, a catcher's offensive production is not traditionally seen as their main contribution to the game. A catcher with

excellent fielding skills may be considered valuable to a professional team over one showing offensive success with poor defensive capabilities. These catchers may end up transferring to a different position or finding a job as a designated hitter. Only four catchers at the major league level reached the number of at bats needed to qualify for the batting crown in 2009,¹ with only three of them batting .300 or above. Additionally, of catchers qualifying for this study, over two-thirds were white, and without any of the remaining catchers being black, including them in the study seemed more of a hindrance than a constructive addition. Asian baseball players were also excluded from the study due to an insufficient amount of players fitting the necessary qualifications. A total of 164 players fit the criteria discussed above for this specific season. The sample includes 97 white players, 28 black players, and 39 players who have been identified as Hispanic.

These 164 players make up only half of the data necessary to complete the study. As each of these players was called up to the major leagues in 2009, a group of minor league players who were *not* moved from AAA to the majors was needed in order to identify if certain races were favored. After finding the players who received a call-up, a random number generator was used to select five players from each AAA team who remained in the minor leagues for the entire 2009 season. Like the previous sample, pitchers and catchers were

¹ Ironically, Joe Mauer, one of the four qualifiers, won the title with his .365 average.

excluded, and players needed at least 50 at bats to be included, as offensive statistics for players beneath this threshold are likely to exhibit much greater variance that is unrepresentative of their actual talent. Of these 150 players randomly selected, 102 were white, 14 were black, and 34 were of Hispanic origin.

Each player's profile on The Baseball Cube includes a photograph of the player and the location of their birthplace. Black players were identified by their photograph, while Hispanic players were found based on a mix of their birthplace and physical characteristics. All players born in Latin America, South America, or other Spanish-speaking countries were included in the sample. Players identified as black Hispanics were placed into the appropriate category based on their birthplace – for example, a black Hispanic born outside of the U.S. was considered Hispanic, while those born within the U.S. were considered black.

Three variables specific to offensive production were included for each player. Batting average, slugging percentage, and on-base percentage were each considered as independent variables (see definitions in the glossary). Additionally, each player's position was noted, as perhaps there are differences in the effects of a marginality bias due to this – for example, outfielders are generally considered to be better offensive players, while infielders (specifically shortstops and second-basemen) may be awarded with playing time based more on their defensive ability. This issue is addressed later in a

specific regression. It is also noted whether a player is a rookie or veteran. A player is considered a rookie if they had played in less than 50 MLB games at the end of the 2009 season. Organizations are sometimes judged by fans and columnists based on the number of prospects they move through their minor league system; if a team is able to have their previous draft picks succeed in the majors, the organization and its scouts are likely to receive continued support. Due to this, rookies may not need as impressive minor league statistics as players who shuffle in and out of the major leagues; however, for older players who have never had significant playing time in the major leagues, this attribute may be harmful to their value, hurting their chances for a call-up. A player is considered a veteran if they have played in more than 500 major league games. Veterans may have been sent down to AAA to work on a specific aspect of their game or for rehabilitation purposes, and their production in the minor leagues may be less important than a player trying to establish themselves on a professional roster. Overall age is also considered, as older players may find it more difficult than young talent to reach the major leagues.

Also included are a few variables measuring diversity within each team's organization. The study considers whether the manager of a player's team is non-white, as well as the team's general manager, as those people higher up in the system may often be making choices independent of a coach's desires. It is possible non-white managers and general managers treat potential non-

white players differently than white managers, either not exhibiting any bias whatsoever, or perhaps even a bias in favor of non-white players. Non-white owners were not considered in the study, as only one professional team has a non-white majority owner.²

Finally, the study observes whether a team plays within a city containing a high percentage of non-white citizens. Perhaps management takes the fan base into consideration when constructing a team, preferring to draft or promote non-white players to allow the team's diversity to coincide with the city itself. With the majority of MLB teams playing in large, diverse metropolitan areas, to be considered a diverse city for this study teams must play in a metropolitan area with non-Hispanic whites representing about a third of the population. Specifically, teams playing in cities with a non-Hispanic white population below 37% are considered diverse for this study.³ For variables indicating a non-white manager, non-white general manager, and diverse city population, new variables were constructed for the regression interacting a player's race with the aforementioned variables; in doing this, the analysis will show whether non-white players on

these teams exhibited an ease of promotion different than white players.

Summary Statistics

Before introducing an empirical model, it may be beneficial to analyze summary statistics to get an idea of the differences between each race's production within the sample. Totaling the race breakdown for the two samples (players called up and those who spent the entire year on a AAA affiliate), 199 of the 314 players were white, 42 were black, and 73 were Hispanic. The 42 black players in the sample represent 13.3% of the total players identified for the study, while the 73 players of Hispanic origin are about 23.2% of the total players. Whites make up the remainder, at 63.3%. The amount of non-whites in the sample is a bit different than their representation in all of the MLB, with blacks here representing 13, rather than 10 percent, and Hispanics at 23 percent, rather than 27; however, these differences appear small enough to still likely portray an accurate picture of the league's racial make-up.

First, as the basis of this study is to conclude whether non-white players being called up must exude greater offensive productivity than whites, it may be beneficial to look at the data for those players who have been called up. The average offensive production at the AAA level for these players in the sample is outlined below in Table 1. It is clear from the data that whites in the sample exhibited a batting average of about 20 points lower than the non-whites. To illustrate how significant this 20 point difference is, it is interesting to consider

² As of the 2010 season, Arte Moreno, majority owner of the Los Angeles Angels of Anaheim, is the only non-white owner of an MLB team.

³ While this percentage appears arbitrary, the majority of cities clustered in either the 50-70% or 20-40% range; in order to capture a representative amount of extremely diverse cities, the 37% cutoff was implemented.

batting averages in the major leagues for the 2009 season. For players with an average of at least 3.1 at bats per team game, the top 56 players in the league hit better than .290, while the top 100 hit .270 or better⁴. Considering that only 102 batters in the MLB qualified for the necessary at bats, a difference of 20 points can propel a player from the lowest percentile to right around the league average.

For on-base percentage and slugging percentage, on average, whites and Hispanics appear to have more similar statistics, with whites lower in on-base percentage and higher in slugging, while blacks exhibit greater averages in all categories. However, the most notable difference appears to be batting average, where the .271 average for whites stands far below the numbers for other races.

However, a better sample to consider might include the players who were *not* called up. Doing so should present a clearer picture as to whether non-whites who didn't get called up achieved offensive statistics superior to whites who were called up. Before furthering the study, this might help in predicting the possible outcome. Production numbers for all players not called up are listed below in Table 2.

First, the numbers reveal that neither blacks nor Hispanics who were not called up were statistically superior in any category to the white players who were called up; such a difference would have been extremely revealing for the

study. It appears that the disparity between races may not be as extreme as it appeared before. While blacks and Hispanics still have an average batting average greater than whites, the difference is reduced to 5-10 points. Additionally, white slugging is no longer lowest, now centered relatively evenly between Hispanics and blacks. Again, Hispanics experienced the lowest slugging percentage, this time to a much greater extent than before. Hispanics who were not called up exhibited an average slugging percentage a full 40 points below whites, and over 60 points below blacks. The difference of slugging for Hispanics not called up and those who were turns out to be almost 100 points, an enormous difference, that if anything, shows that management may keep a particular eye out for Hispanics with the ability to hit for power, as this category is shown to be weakest for Hispanics in both samples. A table summarizing statistics for call-ups and non-call-ups can be found in the appendix. All three measures included in the tables above are included as independent variables within the later regression, as the decision-makers on each ballclub may weight certain production measures greater than others.

The average age of each player in the total sample is 26.9, with whites being the oldest at 27.3 years of age, followed by Hispanics at 26.4, and blacks at 26.1. While these numbers may not tell us much, it is interesting to consider that blacks and Hispanics may develop more quickly than whites, or that teams are more willing to bring whites into the league at a later age, thus allowing them more time to develop in the minor

⁴ Data obtained from www.mlb.com

leagues. However, it is important to note that Hispanic players born outside of the U.S. are eligible to be signed without a high school education, while U.S.-born players must first graduate high school before becoming eligible, thus giving some Hispanic players a greater time to develop in the professional system. Of the 152 rookies in the sample, 100 were white, 19 were black, and 33 were Hispanic. For veterans, of which there were only 27, the majority was white, with 17 in the sample; of the remainder, 4 were black and 6 Hispanic.

Of the 30 MLB teams, 8 employed non-white managers for the 2009 season, while 5 had non-white general managers. A total of 14 teams qualified for the diverse city measure, with Detroit's 12.3% non-Hispanic white population making it the least white city in the sample.

Empirical Model and Results

My empirical model is based on one specific equation, which is run first for all players within the study. As the dependent variable *calledup* is binary, coefficients on the independent variables will represent each variable's influence on the probability a player will be called up to the major leagues. My initial regression is based on the following equation:

$$(1) \text{ Called Up}_{\text{allplayers}} = \beta_0 + \beta_1 \text{black} + \beta_2 \text{hispanic} + \beta_3 \text{battingaverage} + \beta_4 \text{obp} + \beta_5 \text{slugging} + \beta_6 \text{age} + \beta_7 \text{rookie} + \beta_8 \text{veteran} + \beta_9 \text{NWmanager} * \text{NWplayer} + \beta_{10} \text{NWgm} * \text{NWplayer} + \beta_{11} \text{diversecity} * \text{NWplayer} + u.$$

Note: 'NW' stands for Non-white.

This equation seeks to discover if there is a link between a player's race and their propensity to be called up to the major league level. Offensive production, as well as other variables throughout the equation, are used to control for the many factors influencing an organization's decision to promote a player. Using an OLS regression, the null hypothesis being tested is that β_1 and $\beta_2 = 0$. Under normal circumstances, it is assumed that a player's race should not have an effect on the probability they are promoted from AAA to the major leagues. As this study is testing whether Hispanics and blacks have a decreased probability of getting called up, this will be a one-tailed test, as results causing the null hypothesis to be rejected will be indicated by negative coefficients on β_1 and β_2 . However, the significance of all other variables in this test is measured based on a standard two-tailed test. If the two coefficients from the null hypothesis are significant and less than 0, this would suggest that for black and/or Hispanic players, their race alone inhibits them from having the same probability as an equally talented white player from reaching the majors. All variables from β_7 to β_{11} are binary, functioning as either a 0 or 1 depending on if the player fits specific criteria. Age is measured as a whole number, based on the player's age at the end of the 2009 season. It should also be noted that values for batting average, on-base percentage, and slugging percentage were converted into whole numbers for the analysis. Table 3, as seen in the appendix, reveals the results for the regression using Equation 1.

The majority of the significance within the results takes place on the control variables. However, before considering each of these, let us first consider the outcome for the variables from the null hypothesis. We fail to reject the null hypothesis that β_1 and β_2 are equal to zero; in fact, both coefficients proved to actually be *positive*, suggesting that if the results would have been statistically significant, blacks and Hispanics may have an advantage over whites in reaching the major leagues. According to the results, a black AAA player would be about 3% more likely to reach the majors for the 2009 season, while Hispanics would receive a 1% advantage. Of course, due to their insignificance, these coefficients cannot actually be considered to actually reach this conclusion. When comparing white, black, and Hispanic player outcomes, it appears that a marginality bias in favor of whites is not present in the 2009 season.

Of the offensive productivity control variables, both on-base percentage and slugging percentage proved statistically significant at the 5% and 1% level, respectively. Both coefficients were positive, as would be expected – it seems natural that the greater a player’s production, the more likely they are to be promoted. For every point increase in on-base percentage, a player, regardless of race, should expect a 0.2% increase in the probability of being called up; so, if an average black player is hitting 20 points higher than an otherwise identical white player (for example, .280 compared to .260), there is a predicted 4% greater chance they are promoted to the major league level. For

slugging, the results are similar, suggesting a 0.1% increased chance of being called up for each one point increase in slugging percentage. It is extremely interesting to note that the results for batting average were both negative and insignificant. One modern columnist writes that batting average “remains the one consistently understood aspect of the game” (Morrissey, 2007), as even the most lay fan has little trouble interpreting the measure. However, the explosion of the more obscure statistic as made publicly popular in Michael Lewis’ *Moneyball*, as well as the way in which modern baseball has “create[d] some stunning numbers for at bats [and] home runs” (2007), each suggest that both organizations and fans alike may be less focused on a simple statistic such as batting average, paying more attention to other possible outcomes at the plate. When there exist seven ways to reach first base,⁵ why would people want to limit their observation to simply hits per at bat? On-base percentage is able to include additional ways in which a player may get on base, and slugging adequately measures a player’s ability to hit for extra bases. A handful of the MLB’s top current players are known for having traditionally low batting averages while maintaining much larger on-base and slugging percentages.⁶ Of the three offensive measures, it seems appropriate that batting average did not provide

⁵ Hit, walk, hit by pitch, fielder’s choice, error, catcher interference, and dropped third strike

⁶ Adam Dunn and Lance Berkman each finished within the top 15 for OBP and the top 35 in slugging for the 2009 season, while neither batted over .275

significant results, as it seems it has been overlooked in recent years, and players may be exuding talent in alternative ways to impress organizations.

The variable for age showed significance, indicating that for every year older a player becomes, their chances of being called up decrease by about 2%. While this coefficient seems appropriate, as one would assume teams would be less likely to bring up an older player with less potential and fewer successful years ahead of him, it is unlikely that age possesses a completely linear relationship. It is more likely that this variable would be negative for the youngest players and become positive for a brief time when players are at the average period of sufficient development to be ready for the majors. After drafting a player, a team is allowed to keep him within the minor league system for six years before they must either promote him to the major leagues or find an alternative solution, such as releasing or trading the individual. With this in mind, it is likely that players aged 24-27 are being called up the majors more than those falling out of that range.

The significant coefficient on the variable for rookies illustrates that for players who have not played in at least 50 games at the major league level, their chance at gaining promotion is hindered by almost 15%. It makes sense that a player with past major league experience would be more likely to have the skills to reach a professional team again. Additionally, while one may consider this coefficient to be inflated due to extremely young players without present hopes of promotion, it is important to

remember that all players within the study have already established themselves at the AAA level, where they are only one step away from the major leagues.

While the results for rookies appear legitimate, more caution should be considered when analyzing the results for veterans. Although the coefficient suggests that having played in at least 500 major league games garners a 25% increase in the likelihood of promotion, of the 27 veterans in the study, only 7 were not promoted to the majors in the 2009 season. It is unlikely that all 27 of these players were in the minors fighting for a chance to move up, as many could have been either recovering from an injury or called up at different intervals throughout the year to act as pinch hitters or fill a spot on the roster. Also noteworthy is that veteran players, as defined by MLB as those with five or more years of service, must approve of being sent down to the minor leagues – if they don't, the team can either keep them on the major league roster or release the player and continue paying their salary. With this in mind, it is possible some of the veteran players in this study agreed to play in the minor leagues, perhaps acknowledging that their talent level has decreased.

Unfortunately, none of the interaction variables accounting for diversity within management or the team's city proved significant. The results indicate that non-whites playing under diverse management actually had a more difficult time reaching the majors. However, it does appear that non-whites in the most diverse cities

were more likely to be called up, a statistic that was significant at the 25% level.

In Phillips' study, to control for the fact that in 1980 many black baseball players played predominantly outfield positions, he decided to control for this and directly compare statistics for white and black outfielders. In doing so, any variation in offensive productivity based on position is eliminated. Similarly, I decided to run a separate regression which includes only players involved in one of the three outfield positions. Of the 111 outfielders in the study, 70 were white, 27 were black, and 14 were Hispanic. The regression was run based on the same equation as before, only with a different sample of players. The equation is reprinted below.

$$(2) \text{ Called Up}_{\text{outfielders}} = \beta_0 + \beta_1 \text{black} + \beta_2 \text{hispanic} + \beta_3 \text{battingaverage} + \beta_4 \text{obp} + \beta_5 \text{slugging} + \beta_6 \text{age} + \beta_7 \text{rookie} + \beta_8 \text{veteran} + \beta_9 \text{NWmanager} * \text{NWplayer} + \beta_{10} \text{NWgm} * \text{NWplayer} + \beta_{11} \text{diversecity} * \text{NWplayer} + u.$$

Again, using an OLS regression, the null hypothesis being tested is that both β_1 and $\beta_2 = 0$. All of the same control variables are used, with the only difference in regressions being that non-outfielders have been removed from the data. Results are shown in table 4 in the appendix.

The results appear extremely consistent with those from the first equation. Each variable significant in the previous results, except for the rookie variable, is again significant here.

However, the coefficients for on-base percentage and slugging are only significant at the 10% level, where before they reached significance at the 5 and 1% levels, respectively. The coefficient for on-base percentage has increased from about .002 to .003, indicating that this statistic may be of more importance to management for outfielders than remaining position players. Slugging, however, appears almost unchanged, moving from .0013 down to .0012. Older players may have a more difficult time being called up for outfield positions, with a negative coefficient of -.047 for the age variable, suggesting that an outfielder has about a 5% less chance of being called up for each year older they become. Again, it is important to realize that it is unlikely age represents a linear relationship. Although 51 of the 111 outfielders in the sample qualified as rookies, the -.046 coefficient, over three times as large as that of the first equation, was insignificant. However, it appears veteran outfielders, of which there were 7, found it almost twice as likely as non-veterans to be called up, although it is unwise to over-analyze this, as only one veteran outfielder in the study was not called up. One final area of note for this second equation is the higher R-squared value of .2605 as compared to the initial .1906, suggesting that it may be easier to predict call-ups for outfielders than for all players as a whole. Of course, this makes sense, as by limiting the model to outfielders, we have eliminated the possibility of a player's position affecting the results.

Conclusion

Unlike previous studies, which often evaluated players who were already established in the major leagues, this study examines the path that players of different races must take in order to play on a professional roster. Players who moved from a AAA affiliate to a major league ballclub during the 2009 season were included in the data, as well as randomly selected players who were not promoted within the season. A regression using whether a player was called up as the dependent variable used a variety of variables to find what organizations consider when promoting a player; specifically, the study desired to find if non-white players exhibited a more difficult time being called up from AAA to a major league team. Although many of the control variables proved significant, neither blacks nor Hispanics appeared to face any additional barriers when seeking promotion.

With such results, one must return to the drastic differences in offensive production between white and non-white players. What is to account for the discrepancies in offensive production between the races? Perhaps one idea to consider is the raw number of individuals of each race within the system. From the table in the appendix of all players in the sample, we see that at least for batting and on-base percentage, white minor leaguers tend to perform inferior to other races. If the number of whites in the minors is significantly greater than other races (which it is, making up about two-thirds of the league), then the distribution of offensive production makes more sense. With a large portion of whites pulling down these average numbers, those who *are*

performing well are likely to have similar statistics to the blacks and Hispanics being promoted. In this situation, a lower percentage of black and Hispanic players in the minor leagues are performing as poorly as whites, with a greater portion from each race promoted than whites. So, wouldn't this mean that there are more whites in the minor leagues than the majors? By referring back to the summary statistics for those players who were not called up, it appears the figures for this study support this idea. About 68% of the 150 players not called up were white, while whites represented only 60% of players in the MLB last year. Similarly, Hispanics not called up were only 22.6% of the sample, over 4% lower than their MLB presence. Although blacks not called up were proportionately only 1% lower than the MLB average, those who did make the move to the majors overrepresented the league average by 3%.

While the results of this study do not support the idea of a marginality bias currently present in the MLB, a great deal is still captured by these results. It appears that more in-depth offensive statistics, such as on-base percentage and slugging percentage, are being given more weight when deciding a player's promotion. Additionally, regardless of the manager, general manager, or racial make-up of the city in which a team plays in, it still does not appear that race is a factor in promotion. Although Orlando Hudson correctly points out that both Jermaine Dye and Gary Sheffield remain unsigned, successful white players, including pitcher Jarrod Washburn and power-hitting third

baseman Joe Crede, remain on the market as well.

It would be interesting to expand this study in a few different ways. Adding variables measuring defense could be worthwhile, as well as a variable specific to language. While this study examines race, it is likely that a large range of fluency in English exists among the players included. The data also does not capture if there was a specific reason a player was called up; situations in which a player is needed to replace an injured starter are not included in this data. Additionally, teams out of playoff contention may bring up minor league players for a period of evaluation, having no real intention of keeping them on the roster for the following season. Of course, with the constantly changing trends in baseball, be it statistically or in the league's racial make-up, there is no reason a similar study at a later date couldn't produce revealing results different than those observed here.

Appendix:

Table A-1: Average Minor League Offensive Production By Race (All Players)			
	Batting Average	On-Base Percentage	Slugging Percentage
White	0.26046	0.33297	0.41064
Black	0.28088	0.35567	0.43383
Hispanic	0.27597	0.33390	0.38945

Table 1: Average Minor League Offensive Production By Race (Call-ups Only)			
	Batting Average	On-Base Percentage	Slugging Percentage
White	0.27172	0.34601	0.44225
Black	0.2913	0.36839	0.44971
Hispanic	0.29505	0.35208	0.43346

Table 2: Average Minor League Offensive Production By Race (Non Call-ups Only)			
	Batting Average	On-Base Percentage	Slugging Percentage
White	0.24975	0.32056	0.38059
Black	0.26014	0.33021	0.40207
Hispanic	0.25409	0.31306	0.33897

Table 3: Regression using Equation (1)	(1) Dependent Variable: Called Up (All Players)
β_1 Black	.0307(.0950)
β_2 Hispanic	.0113 (.0831)
β_3 BattingAverage	-.0007 (.0012)
β_4 OBP	.0021** (.0010)
β_5 Slugging	.0013*** (.0005)
β_6 Age	-.0237** (.0103)
β_7 Rookie	-.1381** (.0605)
β_8 Veteran	.2529** (.1062)
β_9 NWmanager*NWplayer	-.0164 (.1041)
β_{10} NWgm*NWplayer	-.0412 (.1291)
β_{11} Diversecity*NWplayer	.1082 (.0918)
β_o Constant	.1182 (.3579)
Number of Observations	314
R-Squared	.1906
Adjusted R-Squared	.1611
***Significant at the 1 percent level.	
**Significant at the 5 percent level.	
*Significant at the 1 percent level.	

Table 4: Regression Using Equation (2)	(2) Dependent Variable: Called Up (Outfielders)
β_1 Black	.0293 (.1352)
β_2 Hispanic	.1804 (.1742)
β_3 BattingAverage	-.0016 (.0020)
β_5 Slugging	.0012*(.0007)
β_6 Age	-.0469**(0.0193)
β_7 Rookie	-.0459(.1052)
β_8 Veteran	.4482**(0.2007)
β_9 NWmanager*NWplayer	.0421(.1712)
β_{10} NWgm*NWplayer	-.1323(.2300)
β_{11} Diversecity*NWplayer	.0576(.1628)
β_0 Constant	.6261(.6482)
Number of Observations	111
R-Squared	.2605
Adjusted R-Squared	.1783
***Significant at the 1 percent level.	
**Significant at the 5 percent level.	
*Significant at the 1 percent level.	

Glossary

Batting Average: Number of Hits / Number of At Bats

Slugging Percentage: Number of Bases / Number of At Bats (for example, a double would count as two hits, a triple three, and a home run four)

On-Base Percentage (OBP): Number of Hits, Walks, or Hit-By-Pitch / Number of At Bats + Number of Walks + Number of Hit-By-Pitch

Designated Hitter: In the American League, a player who is part of the nine person lineup but does not play a

position in the field (the pitcher does not bat)

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