RACE, POLICY, AND INDIVIDUAL LABOR PRODUCTIVITY: THE 1964 CIVIL RIGHTS ACT AND PITCHER-BATTER CONFRONTATIONS IN MAJOR LEAGUE BASEBALL*

Andrew W. Nutting** Andrew E. Sfekas

ABSTRACT – We examine how the 1964 Civil Rights Act, passed in the middle of the Major League Baseball season, changed the in-season productivity of pitchers and batters of different races when facing each other. After the Act passed, Southern-born white pitchers gave up higher batting averages and achieved fewer strikeouts against black batters that they had faced earlier in the season. Northern-born, but not Southern-born, black batters hit for higher batting averages and suffered fewer strikeouts against white pitchers. These results suggest racial laws and policies directly affect labor productivity, perhaps through the psychological concept of "locus of control."

Nutting is an Associate Professor of Economics at Bryn Mawr College, 101 N Merion Avenue, Bryn Mawr PA 19010, Phone: 610-524-5407, Fax: 610-526-5655, Email: anutting@brynmawr.edu. Sfekas is a Manager at Cornerstone Research, asfekas@cornerstone.edu.

JEL codes: J71, J78, J24

* Neither author has any funding relationships to disclose.

** Corresponding author.

I. Introduction

Changes in laws, policies, and cultural environments can change outcomes and behavior among different racial and ethnic groups. The Civil Rights Act of 1964 led to fifteen years of continuous relative wage increases for African-Americans in the South region of the United States (Donohue and Heckman 1991). President John F. Kennedy's public request in 1963 that Congress pass civil rights legislation led to significant declines in the share of white Southerners identifying as Democrats (Kuziemko and Washington 2018). The 2016 election of Donald Trump as U.S. president led to increases in racially-motivated hate crimes (Williams 2018)—though some reported hate crimes turned out to be fraudulent (Reilly 2019)—and a significant reduction in the hiring of Muslims in customer service jobs (Gorsuch and Rho 2021). Such findings are not limited to the United States. A 2007 election in Kenya inflamed ethnic tensions and reduced output of a factory's multi-ethnic production teams (Hjort 2014). In Israel, increases in terrorism led Jewish and Arab small-claims court judges to favor own-race litigants in their rulings (Shayo and Zussman 2011, 2017) and Israeli Jews exhibited more customer discrimination against Arab laborers after ethnic violence flared up in Jerusalem and the West Bank (Bar and Zussman 2017). Even beyond the realm of politics and law, cultural events affect behavior. In 2007, heavy publicity of a finding that NBA referees exhibited own-race bias in foul calls—a study that would be published as Price and Wolfers (2010)—immediately ended that referee bias (Pope, Price, and Wolfers 2018).

This paper tests whether changes in race-based policy directly affect something else: individual labor productivity.[1] Evidence suggests that individual-level racial bias, independent

[1] Donohue and Heckman's (1991) finding that relative black wages in the South rose after the Civil Rights Act is not necessarily evidence of increases in Southern black workers' productivity. The returns to their productivity may have risen as labor market discrimination against them fell, in accordance with Becker (1957).

of government policy, is correlated with productivity. Glover, Pallais, and Pariente (2017), using data from France, found that more-biased supermarket managers reduce the attendance and on-the-job performance of Arab and African employees. The enforcement of entrenched social hierarchies also affects productivity. Hoff and Pandey (2014), using data from an experiment involving middle-school-age boys in India, found that openly mentioning the boys' castes in mixed-caste groups reduced productivity of lower-caste boys.

We examine whether the 1964 Civil Rights Act, which was passed approximately halfway through the 1964 Major League Baseball (MLB) season, yielded observable changes in the in-season productivity of black baseball players relative to white ones despite the rules of baseball not changing and the Act not appearing to have any effects on the residential or travel accommodations of any MLB team. This paper thus continues the tradition of using sports data, which captures labor productivity well (Kahn 2000), as an important avenue for research into labor economics issues such as racial discrimination in pay (Kahn 1991), monopsony rents (Scully 1974), and tournament compensation incentives (Ehrenberg and Bognanno 1990).

In baseball, pitchers and batters confront each other in "plate appearances" and "at bats" (the difference between these will be discussed shortly). In 1964 fully 32.8 percent of the 108,349 regular season at-bats featured pitchers and batters of different races. These cross-racial matchups form the identification of our study. We find evidence that over the 1964 season, black batting averages against white pitchers improved after the Act, especially in its immediate wake. We then examine players by both race and region of origin for two reasons: 1) the Civil Rights Act was designed "explicitly and exhaustively" (Risen 2014 p. 256) to dismantle racially discriminatory institutions in one region of the country, the South; and 2) social norms associated with the geographic areas where people grow up affect adult productivity (Charles, Guryan, and

Pan 2018). Results show that after the Civil Rights Act passed, Southern-born white pitchers, but not Northern-born white pitchers, yielded higher batting averages and earned fewer strikeouts against black batters they had also faced earlier in the 1964 season. The Act also led to Northern-born black batters, but not Southern-born black batters, having higher batting averages and fewer strikeouts against white pitchers. This latter result surprised us.

The mechanism through which racial policies affect productivity could be "locus of control," a term from psychology. People with a high locus of control "believe they are responsible for what happens to them" while those with low locus of control "believe their life is controlled by outside forces" (Goldsmith, Veum, and Darity 1997 p. 817). Self-esteem is positively correlated with locus of control (Goldsmith, Veum, and Darity 1997) and noncognitive skills, including locus of control and self-esteem, are positively correlated with wages (Goldsmith, Darity, and Veum 1998; Heckman, Stixrud, and Urzua 2006). The Jim Crow system was an "outside force" with much effect on the lives of Americans in the South. The end of Jim Crow may have decreased the locus of control for Southern whites who had benefitted from segregation, decreasing their psychological capital and labor productivity. It may correspondingly have increased the locus of control of Southern blacks, increasing their psychological capital and labor productivity. Our findings that Southern white pitchers saw productivity losses post-Civil Rights Act is consistent with this theory. Findings showing productivity gains among Northern blacks, but not Southern blacks, when facing white pitchers suggests a more nuanced relationship between anti-discrimination law, region of origin, and locus of control than we had originally anticipated.

Our paper is organized as follows: Section II discusses the history of the 1964 Civil Rights Act and how it pertained to the 1964 baseball season. Section III discusses data. Section IV discusses the empirical strategy and Section V discusses results. Section VI concludes.

II. The Civil Rights Act of 1964

Neither the passage of the Civil Rights Act nor the end of Jim Crow segregation was guaranteed at any stage of its legislative process. Many observers even anticipated that passing the Civil Rights Act would not end Jim Crow. It was not until many Southern businesses, government officials, and institutions complied with the public accommodation provisions of the Act in the immediate wake of its passage—literally *the morning after it passed*—that the public realized it would have major effects.

a. Legislative history[2]

Movements towards Civil Rights began well before the 1960s, and landmarks occurred with the 1947 desegregation of baseball (Rampersad 1998) and President Truman's 1948 order to desegregate the armed forces (Special to the New York Times 1948, Waggoner 1948). A 1948 attempt by Democrats to enact civil rights legislation failed badly, though, and prompted Southern Democrats to support Strom Thurmond's third-party presidential campaign that year. *Brown v. Board of Education* outlawed school segregation in in 1954, but its effects were diluted by the 1955 Supreme Court ruling that desegregation efforts would not be subject to federal supervision and should only proceed "with all deliberate speed." Civil Rights Acts passed by Congress in 1957 and 1960 were toothless.

In June 1960, presidential candidate John F. Kennedy explicitly advocated for civil rights legislation and he reaffirmed his support in an October 1960 debate. In the first few years of his

[2] Much of this section is taken from Risen (2014) and Caro (2002, pp. 558-69).

presidency, though, Kennedy put civil rights on the back burner. Then things changed. In January 1963, Congressmen from both major political parties made public requests for civil rights legislation in the upcoming congressional session. On February 28, Kennedy delivered a speech asking Congress to introduce legislation that expanding voting access and providing federal aid to desegregating school districts.

After a period of anti-segregation demonstrations and unrest in Birmingham, Alabama during the spring of 1963,[3] Kennedy demanded on June 11 that Congress enact laws ending discrimination in public accommodation (which had not been in his February 28 speech) and hastening school desegregation.[4] A bill was submitted on June 19 simultaneously in the House and Senate. Through the summer, testimony in both houses of Congress took place, as did public demonstrations including the famous March on Washington. In September 1963, multiple bombings in Birmingham, including one in a church that killed four African-American girls, prompted an addition to the bill banning employment discrimination. The House Judiciary Committee passed the updated bill on October 29, sending it to the House Rules Committee.

Kennedy was assassinated November 22. On November 26, Lyndon B. Johnson, in his first speech as president, demanded the "earliest passage" of the Civil Rights Act to honor Kennedy.[5] The Rules Committee forwarded the bill to the House floor on January 31, 1964, where it passed February 10 by a vote of 290-130.

This sent matters to the Senate, "the graveyard of civil rights bills" (Caro 2002 p. 560), where Southerners in Senate leadership roles had killed or weakened much civil rights legislation

[3] Kennedy sent soldiers to the Birmingham area as a precaution after hundreds were arrested and anti-segregation demonstration organizers were targeted with bombs. Martin Luther King's famous "Letter from Birmingham Jail" was written after he was arrested during these protests.
[4] Governor George Wallace had publicly defied orders to desegregate the University of Alabama earlier that day.
[5] Johnson, a Texan, had opposed many civil rights bills as a Senator, but as Vice President had delivered a fiery May 1963 pro-civil-rights speech at Gettysburg.

over the years. The Southern strategy was to delay matters until at least the summer, when racial tensions and violence might escalate and turn public opinion against civil rights. Instead, though, pro-civil-rights actions such as write-in campaigns, meetings with Senators, and public religious protests became common. A June 10 cloture vote ended the filibuster 71-29.

The Senate passed the bill itself on June 19 by a vote of 73-27. This sent it back to the House, where it passed 289-126 on July 2. Johnson signed it that night on live television in a ceremony beginning at 7 p.m. Eastern.

Since the South had largely circumvented *Brown v. Board of Education*, many believed even the actual passage of the Civil Rights Act would not change the South's social environment. But the day after the Act's passage, previously-segregated restaurants throughout the South allowed entry to black customers, including members of civil rights organizations who spread the word nationally. Many Southern politicians and chambers of commerce urged "full, immediate compliance" (Risen 2014 p. 240), and compliance was, in the words of the Department of Justice, "large-scale." The Civil Rights Act had ended Jim Crow.

b. The Civil Rights Act and Baseball

The Senate filibuster of the Civil Rights Act was underway when the 1964 baseball season began on April 13. On that day, the opening day game of the Washington Senators (the MLB team) was interrupted when the public-address announcer called on all U.S. Senators in attendance to return to the Capitol to meet a filibuster quorum call. When President Johnson signed the Act on July 2, slightly less than half the MLB season had passed.

In 1964, there appears to have been no segregation of hotels used by major league baseball teams, with the St. Louis hotel used by visiting teams having been desegregated in the mid-1950s (Aaron and Wheeler 1991 p. 89). There were major league teams in the Southern

census region cities of Baltimore, Houston, and Washington D.C., the Southern-adjacent city of Cincinnati, and the somewhat culturally Southern city of St. Louis (located in a state that had legal slavery until the 1860s), but the black Alabama-born baseball player Hank Aaron said Major League Baseball would not be played in "Dixieland…the real South" until the Braves moved from Milwaukee to Atlanta for the 1966 season (Aaron and Wheeler 1991 p. 51).

Media outlets do not appear to have engaged in much discussion of the passage of the Civil Rights Act in the context of baseball. David Halberstam's history of the 1964 baseball season (Halberstam 1994) does not mention its passage, though it mentions changing public attitudes towards civil rights and black players' experiences of Jim Crow segregation in the minor leagues and during spring training in Florida. The *New York Times* in 1964 featured no articles that jointly included the terms "civil rights" and "baseball." An article in the April 1964 issue of the African-American magazine *Ebony* chastised black baseball players for their lack of participation in civil rights demonstrations, and this article was referenced by African-American newspapers such as the *Philadelphia Tribune* ("Can Negro Major Leaguers…" 1964), but the *Tribune* did not contain any articles linking baseball to civil rights in the wake of the Act's passage.

Autobiographies by the black baseball players Hank Aaron, Ernie Banks, Bob Gibson, and Willie Mays,[6] all of whom were active in 1964 and are now Hall-of-Famers, contain no mention of the Civil Rights Act's passage even though all discuss racism and especially Southern Jim Crow racism. Aaron mentions his 1963 involvement in the civil rights movement in Alabama (p. 168) and Mays discusses tensions on his 1964 team related to his manager's comments on civil rights (p. 215), but neither mention the Act's passage in July 1964.

[6] Respectively Aaron and Wheeler (1991), Banks and Enright (1971), Gibson and Wheeler (1994), and Mays and Sahadi (1996). These were the only players' autobiographies read in preparation of this paper.

Lastly, the Civil Rights Act was passed the Thursday night before the 1964 All-Star Break, which lasted from Monday July 6 through Wednesday July 8. If Southern players visited home during the break, they could have witnessed the effects of the Civil Rights Act firsthand and experienced immediate changes in locus of control as a result.

III. Data and summary statistics

Play-by-play data for the 1964 baseball regular season was scraped from the websites baseball-reference.com and retrosheet.org.[7] The broadest group of observations in this paper is *plate appearances*, which are confrontations between batters and pitchers that end with the batter either reaching base, becoming out, or causing a baserunner to become out. Plays that are not plate appearances, such as stolen bases, balks, and errors on foul balls, are removed. Many of the estimations in this paper involve a subset of plate appearances called *at-bats* (AB). At-bats are generally defined as plate appearances that end in either a base hit (H) or an out, i.e. plate appearances omitting bases on balls (BB) and hit by pitches (HBP). At-bats also do not include sacrifice bunts (SH) or sacrifice flies (SF), even though such plays record outs.

The primary estimations in this paper have a dependent variable of either batting average (BA) or strikeout (K). Batting average, an official baseball statistic, is defined as $\frac{\text{Total H}}{\text{Total AB}}$. In this paper, it is binary. If a player records a hit (H), his BA for that at-bat is 1. If he records an out (sacrifices not included), it is 0. If the plate appearance is not an at-bat, BA is undefined. Strikeout, an outcome that is considered the apex of a pitcher's dominance over a batter (Beller 2018), is also binary. Estimation samples when the dependent variable is strikeout include all plate appearances, not just at-bats.

[7] Data was first scraped from baseball-reference.com. There was an error in scraping data for the Houston Colt .45s team, which existed from 1962-64 (and in 1965 was renamed the Astros), and their data was scraped from retrosheet.org.

Other estimations have dependent variables of on-base percentage (OBP), slugging percentage (SLG), and hit-by-pitch (HBP). OBP is an official statistic equal to $\frac{\text{H+BB+HBP}}{\text{AB+BB+HBP+SF}}$. In this paper, it is binary: if the batter reaches base by hit, base-on-balls, or hit-by-pitch, his OBP for that plate appearance is 1. If he records an out, including a sacrifice fly (which for some reason is included in OBP), it is 0. Sacrifice bunts have undefined OBP. SLG is officially equal to $\frac{\text{Total Bases}}{\text{Total AB}}$, where Total Bases are 0 for an out, 1 for a single, 2 for a double, 3 for a triple, and 4 for a home run. Plate appearances that are not at-bats have an undefined SLG.

Hit-by-pitches are a means of intimidation (Kanango and Surdam 2020; Kurkjian 2009, 2012) and have ruined batters' careers (Ryan 2013) and caused death (Sowell 2003). The Civil Rights Act may have prompted retaliation, e.g. white pitchers hitting more black batters with pitches. Estimation samples when the dependent variable is hit-by-pitch include all plate appearances.

Player race is either black or white. For American-born players, race was assigned by one of the paper's two co-authors performing a visual inspection of photographs found on the internet.[8] The vast majority of players have photographs available on baseball-reference.com. Among players whose photographs are not there, images were frequently found via google image search on websites like Pinterest. If no photograph was found on the internet—a very rare occurrence involving only players with tiny numbers of games played—the player was categorized as white, since white players formed the majority of major league players and a disproportionately large share of lower-quality players (Hanssen 1998).

Player ethnicity is categorized as Hispanic or non-Hispanic. Players are defined as Hispanic if they were born in a Spanish-speaking country or Puerto Rico, with birthplace data

[8] Masonori Murakami, a Japanese player born in Japan, is classified as white.

coming from the Lahman baseball database at seanlahman.com. Both co-authors of this paper independently classified Hispanic players' race as black or white after visually inspecting photographs. If the authors' initial classifications differed, they debated the player's classification. For all players from 1964, the authors were able to come to an agreement and assign a race to the Hispanic player.

For all plate appearances, the game's date is recorded and the game is classified as either a home or away game for the batter. In 1964 there were ten teams each in the American League and National League, there was no interleague play, and there was no designated hitter. Parsons et al (2011) found that umpire race affects ball-and-strike calls, but since all umpires in 1964 were white (Becker 1966), we do not account for umpire race in our analysis. There were also no black managers in 1964 (Robinson and Anderson 1976).

The Civil Rights Act was signed by President Johnson at approximately 7 p.m. Eastern Daylight Time on July 2, 1964. Games of the 1964 season up to and including those played on July 2 are considered to have preceded the Civil Rights Act. Games played July 3 and after occurred after the Act was passed. A dummy variable *ACT* is 1 for games played after the Act was signed and 0 for games played before it was signed.

Table 1 shows means of some key variables, all of which are dummies. Table 1 means are based on at-bats, except for strikeout, which is based on plate appearances. The batting average of the overall sample was .255, with fewer than 49 percent of at-bats performed by the home team.[9] Slightly over 15 percent of plate appearances ended in a strikeout. Over half of all at-bats occurred after the Civil Rights Act was passed. The variables *WHITEPITCH_WHITEBAT*, *WHITEPITCH_BLACKBAT*, *BLACKPITCH_WHITEBAT*, and

[9] Home batters are rarer than visiting batters because the bottom of the ninth inning is not played when the home team is ahead.

BLACKPITCH_BLACKBAT are determined by the interaction of pitcher and batter race. Almost 65 percent of at-bats occurred between two white players. Over 26 percent occurred between a white pitcher and a black batter. Fewer than 10 percent had a black pitcher. Column 2 removes at-bats with Hispanic batters, Column 3 includes those with Hispanic batters but removes those with Hispanic pitchers, and Column 4 removes those with either Hispanic pitchers or Hispanic batters. The percentage of at-bats involving at least one black player falls from 35.6 percent in Column 1 to 29.6 percent in Column 4, indicating Hispanic players were more likely to be black.

IV. Estimation Strategy

Where i is plate appearance, t is game, j is batter, and k is pitcher, the equation

$$\begin{aligned} Y_{itjk} = {} & \alpha_1 + \alpha_2 BATTERHOME_{jt} \\ & + \beta_1 WHITEPITCH\_BLACKBAT_{itjk} + \beta_2 BLACKPITCH\_WHITEBAT_{itjk} \\ & + \beta_3 BLACKPITCH\_BLACKBAT_{itjk} + \beta_4 ACT_t \\ & + \beta_5 ACT_t * WHITEPITCH\_BLACKBAT_{itjk} \\ & + \beta_6 ACT_t * BLACKPITCH\_WHITEBAT_{itjk} \\ & + \beta_7 ACT_t * BLACKPITCH\_BLACKBAT_{itjk} + \gamma_j + \phi_k + \varepsilon_{itjk} \end{aligned} \quad (1)$$

is estimated. In most estimations the dependent variable is batting average (BA) or strikeout (K). When it is BA, the sample only consists of at-bats. When it is K, it is all plate appearances.

BATTERHOME is a dummy variable equal to 1 if batter j played at home in game t. *ACT*, the dummy identifying games played after the Civil Rights Act passed, is included in Equation (1) both as a stand-alone right-hand-side variable and in interactions with *WHITEPITCH_BLACKBAT*, *BLACKPITCH_WHITEBAT*, and *BLACKPITCH_BLACKBAT*. (*WHITEPITCH_WHITEBAT* is omitted.) The coefficients β_5, β_6, and β_7 capture the difference-in-difference effects of the Civil Rights Act depending on the races of the batter and the pitcher.

γ_j and ϕ_k are fixed effects controls respectively capturing batter and pitcher quality over the full 1964 season. Since pitchers and batters often perform differently against right-handed

and left-handed opponents, γ_j and ϕ_k treat each player as two different people depending on opponent handedness.[10] Handedness for both batting and throwing is available in the Lahman database.

Further estimations take the form

$$\begin{aligned} Y_{itjk} = {} & \alpha_1 + \alpha_2 BATTERHOME_{jt} + \beta_1 ACT_t \\ & + \beta_2 ACT_t * WHITEPITCH\_BLACKBAT_{itjk} \\ & + \beta_3 ACT_t * BLACKPITCH\_WHITEBAT_{itjk} \\ & + \beta_4 ACT_t * BLACKPITCH\_BLACKBAT_{itjk} + \theta_{jk} + u_{itjk} \end{aligned} \quad (2)$$

where the fixed effects γ_j and ϕ_k are replaced by θ_{jk}, a fixed effects vector capturing the *matchup* of batter *j* and pitcher *k*. Whereas the Equation (1) fixed effects capture the general quality of specific pitchers and batters, the Equation (2) fixed effects capture idiosyncrasies of specific pitcher-batter matchups (Griffey 1993, Mearns 2015). Since the dummy variables *WHITEPITCH_BLACKBAT*, *BLACKPITCH_WHITEBAT*, and *BLACKPITCH_BLACKBAT* do not vary within-matchup, they are not included as stand-alone variables in Equation (2).

There are no dummy variables for Hispanic ethnicity in Equations (1) or (2). Instead, estimations include or omit observations based on the Hispanic status of the pitcher and/or batter.

All estimations of Equations (1) and (2) are OLS. Standard errors are clustered at the team-game level, i.e. there are two clusters for each game, one for each batting team. Clustering is commonly understood to be necessary when error terms are expected to be correlated across observations (e.g., Cameron & Miller 2015). Clustering at the game level allows correlation between at-bats within the same game, which could occur if, for example, starting pitchers have game-to-game variation in productivity. This clustering rationale leaves open other possible

[10] Against switch hitters, pitchers are assumed to face the opposite of their own pitching hand, i.e. right-handed pitchers face left-handed batters and vice versa.

clusters, including clustering by pitcher-batter matchup across the entire season. The question of which clustering approach is more reasonable may be resolved by Abadie et al. (2017), who note that clustering is appropriate when either (i) the sample does not include all clusters in a population, or (ii) the assignment of the treatment was clustered. Our sample includes the universe of plays within the 1964 season, so we can assume that the sample includes observations from all clusters in the population. Assignment of the treatment depends on time of year: games played after passage of the Act are "treated," while games played before passage are not. Thus, game-level clustering is the most reasonable approach. Qualitative results do not change if we cluster at the matchup level.

V. Results

a. Results by Race

Throughout this paper, we only show results from estimations omitting Hispanic batters. Since the Civil Rights Act was designed to alter institutional arrangements between blacks and whites in a specifically American context, foreign-born batters may cloud our results.[11]

Table 2 shows coefficients on *ACT* and its interaction terms with batting average (Columns 1-4) and strikeout (Columns 5-8) as the dependent variables. The Column 1 estimation includes Hispanic pitchers and controls for individual fixed effects for pitcher and batter. Column 1 shows that, at the 10% level of significance, white batters performed worse post-Act when facing black pitchers. This is consistent with the Civil Rights Act improving the productivity of blacks vis-à-vis whites. The coefficient falls and becomes insignificant when controlling for matchup fixed effects instead of individual fixed effects (Column 2).

[11] Baseline estimates when including Hispanic batters are available upon request, and they tend to either reaffirm our findings or be statistically insignificant instead of significant.

Column 2 shows black batters had significantly, at the 10% level, higher batting averages post-Act when facing white pitchers. That this occurs with matchup fixed effects shows that black batters improved their batting averages against white pitchers they had faced earlier in the season before the Act passed. Columns 3-4 repeat Columns 1-2 but drop Hispanic pitchers from the sample, limiting the sample to American-born players. No coefficients are significant in these two columns. Table 2 Columns 1-4 thus show some evidence that the Civil Rights Act led to improvements in the productivity of blacks relative to whites. Results are not robust to different populations or specifications, though.

Columns 5-8 repeat Columns 1-4 but change the dependent variable to strikeout. Three coefficients show that black batters suffered fewer strikeouts against white pitchers post-Act. These suggest improved relative black productivity after the Civil Rights Act Passed.

Figure 1 shows 95 percent confidence intervals on coefficients when interacting *WHITEPITCH_BLACKBAT* with the month of the season. This serves as a test of the parallel trends assumption (e.g. Anti 2021) and shows other interesting results. Results for the four significant *ACT*WHITEPITCH_BLACKBAT* coefficients in Table 2 are shown. To separate pre-Act months from post-Act months, and since games on July 1-2 are considered pre-Act, the first two days of each month are assigned to the previous month, i.e. May 1-2 are assigned to April, June 1-2 to May, July 1-2 to June, etc. All October games (the final regular season games were October 4) are assigned to September. The reference month is June, the last pre-Act month.

Figure 1a shows the parallel trends assumption holds for the finding that black batters post-Act hit for higher batting averages off white pitchers when including Hispanic pitchers and controlling for matchup fixed effects. In July, in the immediate wake of the Act, black batters improved their batting average against white pitchers by 0.035 compared to June, a difference

that is significant at the 5% level.[12] Figure 1b shows the parallel trends assumption holds for the Table 2 Column 5 estimation where the dependent variable is strikeout, when including Hispanic pitchers, and when controlling for individual fixed effects. Figure 1b shows that strikeouts by black batters against white pitchers fell by 0.023 in July compared to June, a difference that is significant at the 1% level. Figures 1c-d show the parallel trends assumption fails when the dependent variable is strikeout and when controlling for matchup fixed effects.

b. Results by Race and Region

It is possible that any effects the Civil Rights Act had on ending discrimination in public accommodation changed player productivity not only by race but by region of origin, since the Civil Rights Act was designed to have a strong effect on one specific region of the country: the South. With the end of legalized Jim Crow segregation, white players from the South may have experienced reductions in locus of control and productivity. Black players from the South may have experienced increases in locus of control and productivity.

This section takes a gradual approach in examining how region interacted with the Civil Rights Act's impact on productivity. First, only white players are separated into Northerners and Southerners, and only when facing black players. Then, only black players are separated by region, and only when facing white players. Lastly, both black and white players are separated by region, to see whether the Act affected region and race in an interactive fashion.

Players are classified as from the South if they were born in the census South region. All players not from "the South," including those born in Latin America, are from "the North." Among blacks, Southerners comprised the majority of batters (76.5% of at-bats when omitting Hispanic pitchers and batters) and pitchers (59.9%), and a larger share of batters than pitchers.

[12] When omitting Hispanic pitchers (not shown), the increase in batting average in July is 0.032 and it is significant at the 10% level.

Among whites, Southerners also formed a larger share of batters (32.6% of at-bats when omitting Hispanics) than pitchers (24.7%).

i. Northern and Southern whites

Table 3 shows results from full-season estimations when separating whites by region, and only when facing blacks. When the dependent variable is batting average, the coefficient on *ACT*WHITEPITCHSOUTH_BLACKBAT* is significantly positive when controlling for matchup fixed effects (Columns 2 and 4). That these results are significant only when including matchup fixed effects suggests that after the Civil Rights Act passed, Southern white pitchers yielded batting averages that were 38-39 points higher against those black batters that they had also faced earlier in the season. This is a very substantial increase. Columns 6 and 8 further show that these higher batting averages were associated with significantly fewer strikeouts. These results suggest that ending legal segregation provided a decrease in productivity for Southern white pitchers when facing black batters with whom they were familiar. One result in Column 5 showing that Northern white pitchers accrued fewer strikeouts against black batters post-Act is not accompanied by a change in batting average and does not survive when either controlling for matchup fixed effects or when dropping Hispanic pitchers from the sample.

Figure 2 shows month-by-month effects in 1964 of *WHITEPITCHSOUTH_BLACKBAT*, corresponding with the four significant coefficients in Table 3 when controlling for matchup fixed effects. In all four cases, the parallel trends assumption holds. Every post-Act month in Figures 2c and 2d shows significantly, at least at the 10% level, fewer strikeouts by white Southern pitchers against black batters, suggesting a long-term reduction in productivity for white Southern pitchers after the Act passed.

Table 4 shows results from falsification tests that determine whether the significant results in Table 3 were unique to 1964 or were frequently observed around mid-seasons of adjacent years. The Civil Rights Act was passed the Thursday night before the 1964 All-Star break, and it is possible that, season after season, white Southern pitchers performed worse against black batters after the All-Star break. Table 4 shows coefficients on *ACT*WHITEPITCHSOUTH_BLACKBAT* when assigning *ACT* = 1 for games played after the Thursday before the All-Star game for each season from 1962 (the first season with 20 teams instead of 16) through 1966.[13] We extend beyond the adjoining 1963 and 1965 seasons because those years both had substantial Civil-Rights-Era activity—the written proposal of civil rights legislation in the summer of 1963, the passing of the Voting Rights Act in August 1965—that may pollute results. 1964, the year of the Civil Rights Act, is the only year white Southern pitchers experienced worse outcomes against black batters in the second half of the season compared to the first.

Table 5 shows coefficients on *ACT*WHITEPITCHSOUTH_BLACKBAT* in 1964 estimations when using different dependent variables.[14] When controlling for matchup fixed effects, Southern white pitchers post-Act yielded higher slugging percentages. Curiously they did not yield higher on-base percentages, suggesting the higher batting averages black batters experienced off of white Southern pitchers may have come at the expense of bases on balls. Hit-by-pitches is never significant, showing no significant evidence of retaliation by Southern white pitchers against black batters.

[13] 1962 was the last season with two All-Star games and two All-Star breaks. Table 4 uses the first All-Star break (July 10) as the reference point. The second was on July 30.

[14] When the dependent variable is slugging percentage, observations are limited to at-bats, the same as for batting average. When it is hit-by-pitches, it is all plate appearances, the same as for strikeouts. When it is on-base percentage, it is plate appearances minus sacrifice hits (bunts).

ii. Northern and Southern blacks

Tables 6-8 separate black players into Northerners and Southerners when they face whites. Table 6 shows baseline estimation results for 1964. The coefficient on *ACT*WHITEPITCH_BLACKBATNORTH* is significantly positive when the dependent variable is batting average (Columns 1-4) and significantly negative when it is strikeout (Columns 5-8). *ACT*WHITEPITCH_BLACKBATSOUTH* is insignificant in every specification. Northern black batters, but not Southern ones, increased their productivity against white pitchers post-Act. Columns 1 and 3 show that Southern black pitchers yielded lower batting averages against white batters, suggesting an increase in their locus of control. That is insignificant when controlling for matchup fixed effects, though, and does not correspond with more strikeouts.

Figure 3 shows month-by-month effects of *WHITEPITCH_BLACKBATNORTH* for the findings regarding batting average in Columns 1-4. In all four specifications, the parallel trends assumption holds. Controlling for matchup fixed effects shows an especially massive, statistically significant increase in batting average in July—the immediate wake of the Civil Rights Act—compared to June. The increase is 0.071 when including Hispanic pitchers (Figure 3b) and 0.064 when omitting them (Figure 3d). Figure 4 repeats Figure 3 for the strikeout estimations in Table 6 Columns 5-8. In all four specifications the parallel trends assumption again holds. In Figures 4a-c, the months of July, August, and September all have significantly fewer strikeouts than June at least at the 10% level, indicating a sustained improvement in productivity for Northern black batters post-Act.[15]

Table 7 shows that the improvement of Northern black batters' batting average when facing white pitchers did not happen in the years around 1964, though there is evidence that

[15] The parallel trends assumption also holds for the findings that Southern black pitchers yielded lower batting averages post-Act against white batters in Table 6 Columns 1 and 3 (not shown).

Northern black batters struck out less against white pitchers in 1966 after the midseason point. Table 8 shows coefficients on *ACT*WHITEPITCH_BLACKBATNORTH* in 1964 estimations when using different dependent variables.[16] The increase in post-Act batting average for Northern black batters in 1964 is associated with a significantly higher on-base percentage in every specification. Slugging percentage significantly increases when including matchup fixed effects. Hit-by-pitches is never significant, showing no significant evidence of retaliation against Northern black batters by white pitchers.

Our finding that productivity rose post-Act for Northern, but not Southern, black batters surprised us. We had expected an increase in locus of control and productivity to be experienced by Southern black batters because of their new freedoms, but our results suggest that the Act was received by America's black population—or at least its black baseball players—in a more complex way than that. Southern black players may have remained wary of race relations—the Voting Rights Act would not be passed until 1965, for example—while Northern black players, many if not most of whom had experienced explicit Southern segregation either in the minor leagues or at spring training in Florida (and almost certainly had family members who had lived under Jim Crow segregation) received the Civil Rights Act's passage more optimistically.

Perhaps buttressing our finding, McAdam (1999) notes that in the second half of the 1960s the central stage for civil rights activities moved from the South to the North. One especially noticeable change in the country's post-Act racial environment that was concentrated in the North and began soon after the Civil Rights Act was passed was the series of major race riots. The riots are often considered to have begun in New York City two weeks after the Act

[16] When the dependent variable is slugging percentage, observations are limited to at-bats, the same as for batting average. When it is strikeouts or hit-by-pitches, it is plate appearances. When it is on-base percentage, it is plate appearances minus sacrifice hits (i.e. sacrifice bunts).

was signed ("Race Riots of the 1960s" 2020, Collins and Margo 2007).[17] The three deadliest riots (Los Angeles in 1965, Detroit in 1967, and Newark in 1967) were all outside the South. According to a metric created by Collins and Margo (2007), only two of the 15 most severe race riots from 1964-71 were in the census South region, and both of those were in border areas (the riots in Washington and Baltimore after the 1968 assassination of Martin Luther King).[18]

iii. Northern and Southern whites and blacks

Table 9 shows results when separating both whites and blacks by Northern/Southern status. The omitted interaction term is *ACT*WHITEPITCHNORTH_WHITEBATNORTH*.[19] Results in Columns 1-8 show that the primary finding in Table 3, that Southern white pitchers performed worse post-Act against black batters when including matchup fixed effects, applies to Southern white pitchers' performances both against Northern black batters and Southern black batters. They also show that the primary results from Table 6, that Northern black batters improved their hitting off white pitchers post-Act, applies to their performance against both Northern white pitchers and Southern white pitchers. There is no evidence that Southern black batters improved their batting post-Act against Northern white pitchers.

Columns 9-12 show results when the dependent variable is hit-by-pitch. All four columns show that Northern black pitchers significantly increased their hit-by-pitches of Southern black batters after the Civil Rights Act passed. Effects are very large, especially considering that the mean 1964 HBP value when black pitchers faced black batters was 0.0040 (0.0032 when omitting Hispanic pitchers), compared to 0.0057 (both with and without Hispanic

[17] Collins and Smith (2007) use Cleveland, a Northern city, as a case study for the effect of riots.
[18] We thank Collins and Margo for sharing their data with us. According to their factor analysis methodology, Washington D.C. and Baltimore riots were respectively the third-most and fifth-most severe riots of the era. Newark was fourth, despite yielding more fatalities than Washington.
[19] Cross-racial results are similar when not separating players by region if they face a same-race player. In those cases, the omitted interaction term is *ACT*WHITEPITCH_WHITEBAT*.

pitchers) when white pitchers faced white batters. Figure 5 shows month-by-month effects of *BLACKPITCHNORTH_BLACKBATSOUTH* on HBP. All four specifications satisfy the parallel trends assumption and show a large increase in HBP in July compared to June. The differences for July are significant at the 10% level in Figures 5a-c and have a p-value of 0.109 in Figure 5d. Effects steadily decrease after July.

The autobiography of the black pitcher Bob Gibson—a Northerner born in Nebraska—may help shed some light on this finding. In it, Northern-born black batter Dick Allen is quoted as saying (Gibson and Wheeler 1994 p. 165),

> We played in a time when black people were supposed to stick together, so I asked Gibson one time why he always threw at the brothers [black batters]. He said, "Because they're the ones who are gonna beat me if I don't."

This quote suggests black pitchers took a conscious approach to hitting black batters with pitches. It seems possible, since hit-by-pitches are often signs of retaliation (e.g. Lupica 2020), that Northern-born black pitchers were hesitant pre-Act to bean Southern-born black batters, then "took the gloves off," perhaps with pent-up sentiments, in the immediate wake of its passage.

VI. Conclusion

We find that changes in a country's laws and policies regarding race significantly alter the labor productivities of individuals of different races. We perform difference-in-difference estimations to determine whether the passage of the 1964 Civil Rights Act affected the outcomes of cross-racial confrontations between pitchers and batters during the 1964 baseball season. We find that post-Act black batters increased their batting averages against white pitchers, particularly in the month immediately after the Act's passage. We also find that white Southern pitchers yielded higher batting averages and achieved fewer strikeouts post-Act when facing black batters that they had faced earlier in the 1964 season. Black Northern batters improved

their batting averages and suffered fewer strikeouts against white pitchers post-Act. Northern black pitchers hit more Southern black batters with pitches in the immediate wake of the Act.

The reduced productivity of white Southern pitchers when facing black batters post-Act appears consistent with an interpretation of "locus of control" affecting productivity. Southern whites had been aided by a Jim Crow system, and its abolition made their lives more subject to "outside forces" than it had been. That Northern, but not Southern, black batters saw productivity improvements post-Act surprised us, but is evidence that black Americans responded to the Civil Rights Act in a more complicated fashion than we had anticipated.

This difference-in-difference analysis can be applied to many other changes in laws or social backgrounds. It may be interesting, for example, to examine players of different races and whether their performances changed in the wake of race riots that plagued the United States during the second half of the 1960s (Collins and Margo 2007). That study would require something more complex than a difference-in-difference study, of course, because it would have to account for a player's proximity to a given riot.

DISCLOSURE STATEMENT

The authors declare that they no conflicts-of-interest or funding sources to disclose.

REFERENCES

Aaron, Hank; Wheeler, Lonnie. 1991. *I Had a Hammer: The Hank Aaron Story*. New York: HarperCollins Publishers.

Abadie, Alberto; Athey, Susan; Imbens, Guido W.; Wooldridge, Jeffrey. 2017. "When should you adjust standard errors for clustering?" NBER Working Paper 24003.

Anti, Sebastian. 2021. "Land Grabs and Labor in Cambodia." *Journal of Development Economics* 149, article 102616.

Banks, Ernie; Enright, Jim. 1971. *Mr. Cub*. Chicago: Follett Publishing Company.

Bar, Revital; Zussman, Asaf. 2017. "Customer Discrimination: Evidence from Israel." *Journal of Labor Economics* 35:4, pp. 1031-1059.

Becker, Gary S. 1957. *The Economics of Discrimination*. Chicago: The University of Chicago Press.

Becker, Bill. 1966. "Ashford Is Displaying a Zest for Umpiring." *The New York Times*. February 27, Section 5 p. 2.

Beller, Michael. 2018. "Kerry Wood's 20-Strikeout Outing Is the Greatest Pitching Performance Ever ... And I Missed It." *SI.com*. May 4. Retrieved October 23, 2019.

Cameron, A. Colin; Miller, Douglas L. 2015. "A practitioner's guide to cluster-robust inference." *Journal of Human Resources* 50:2, pp. 317-372.

"Can Negro Major Leaguers Enroll In Rights Fight?" 1964. *The Philadelphia Tribune*. April 28, p. 12.

Caro, Robert A. 2012. *The Years of Lyndon Johnson: The Passage of Power*. New York: Alfred A. Knopf.

Charles, Kerwin Kofi; Guryan, Jonathan; Pan, Jessica. 2018. "The Effects of Sexism on American Women: The Role of Norms vs. Discrimination." NBER Working Paper 24904.

Collins, William J.; Margo, Robert A. 2007. "The Economic Aftermath of the 1960s Riots in American Cities: Evidence from Property Values." *Journal of Economic History* 67:4, pp. 849 - 883.

Collins, William J.; Smith, Fred H. "A neighborhood-level view of riots, property values, and population loss: Cleveland 1950–1980." *Explorations in Economic History* 44:3, pp. 365-386.

Donohue, John J. III; Heckman, James J. 1991. "Continuous Versus Episodic Change: The Impact of Civil Rights Policy on the Economic Status of Blacks." 1991. *Journal of Economic Literature* 29:4, pp. 1603-43.

Ehrenberg, Ronald G.; Bognanno, Michael L. 1990. "Do Tournaments Have Incentive Effects?" *Journal of Political Economy* 98:6, pp. 1307–24.

Gibson, Bob; Wheeler, Lonnie. 1994. *Stranger to the Game: The Autobiography of Bob Gibson*. New York: Penguin Books.

Glaeser, Edward L.; Shliefer, Andrei. 2005. "The Curley Effect: The Economics Of Shaping The Electorate." *Journal of Law, Economics and Organization* 21:1, pp. 1-19.

Glover, Dylan; Pallais, Amanda; Pariente, William. 2017. "Discrimination as Self-Fulfilling Prophecy: Evidence from French Grocery Stores." *Quarterly Journal of Economics* 132:3, pp. 1219-60.

Goldsmith, Arthur H.; Darity, William Jr.; Veum, Jonathan R.. 1998. "Race, Cognitive Skills, Psychological Capital, and Wages." *Review of Black Political Economy* 26:2, pp. 9-21.

Goldsmith, Arthur H.; Veum, Jonathan R.; and Darity, William Jr. 1997. "The Impact of Psychological and Human Capital on Wages." *Economic Inquiry* 35:4, pp. 815-829.

Gorsuch, Marina Mileo; Rho, Deborah. 2021. "Customer Prejudice & Salience: The Effect of the 2016 Election on Employment Discrimination." Forthcoming, *Journal of Population Economics*.

Griffey, Ken Jr. 1993. "Ask Junior." *The Seattle Times*, August 17 p. C1.

Halberstam, David. 1994. *October 1964*. New York: Ballantine Books.

Hanssen, Andrew. 1998. "The Cost of Discrimination: A Study of Major League Baseball." *Southern Economic Journal* 64:3, pp. 603-27.

Heckman, James J.; Stixrud, Jora; Urzua, Sergio. 2006. "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior." *Journal of Labor Economics* 24:3, pp. 411-82.

Hjort, Jonas. 2014. "Ethnic Divisions and Production in Firms." *Quarterly Journal of Economics* 129:4, pp. 1899-1946.

Hoff, Karla; Pandey, Prikiya. 2014. "Making up people—The effect of identity on performance in a modernizing society." *Journal of Development Economics* 106, pp. 118-31.

Kahn, Lawrence M. 1991. "Discrimination in Professional Sports: A Survey of the Literature." *Industrial & Labor Relations Review* 44:3, pp. 395–418.

Kahn, Lawrence M. 2000. "The Sports Business as a Labor Market Laboratory." *Journal of Economic Perspectives* 14:3, pp. 75-94.

Kanango, Bryce; Surdam, David George. 2020. "Intimidation, Discrimination, and Retaliation: Hit-by-Pitches during the Integration of Major League Baseball." *Atlantic Economic Journal* 48:1, pp. 67-85.

Kurkjian, Tim. 2009. "Reliving the Randy Johnson experience." ESPN.com, June 3.

Kurkjian, Tim. 2012. "The horrors of getting hit by a pitch." ESPN.com, August 3.

Kuziemko, Ilyana; Washington, Ebonya. 2018. "Why Did the Democrats Lose the South? Bringing New Data to an Old Debate." *American Economic Review* 108:10, pp. 2830-67.

Lupica, Mike. 2020. "The 'code' is outdated … and dangerous." *MLB.com*. September 2. Accessed via MLB.com on September 14, 2020.

Mays, Willie; Sahadi, Lou. 1996. *Say Hey: The Autobiography of Willie Mays*. Norwalk, Connecticut: Easton Press.

McAdam, Doug. 1999. *Political Process and the Development of Black Insurgency, 1930-1970: Second Edition.* Chicago: The University of Chicago Press.

Mearns, Andrew. 2015. "Upon Pedro Martinez's induction to the Hall of Fame, a remembrance of his Yankees nemesis: Enrique Wilson." *Pinstripealley.com*, January 9. Accessed October 23, 2019.

Parsons, Christopher A.; Sulaeman, Johan; Yates, Michael C.; Hamermesh, Daniel S. 2011. "Strike Three: Discrimination, Incentives, and Evaluation." *American Economic Review* 101:4, pp. 1410-35.

Pope, Devin G.; Price, Joseph; Wolfers, Justin. 2018. "Awareness Reduces Racial Bias." *Management Science* 64:11, pp. 4988-95.

Price, Joseph; Wolfers, Justin. 2010. "Racial Discrimination Among NBA Referees." *The Quarterly Journal of Economics* 125:4, pp. 1859-87.

"Race Riots of the 1960s." 2020. encyclopedia.com. Accessed September 20, 2020.

Rampersad, Arnold. 1998. *Jackie Robinson: A Biography*. New York: Ballantine Books.

Reilly, Wilfred. 2019. *Hate Crime Hoax: How the Left is Selling a Fake Race War*. Washington D.C.: Regnery Publishing.

Risen, Clay. 2014. *The Bill of the Century: The Epic Battle for the Civil Rights Act*. New York: Bloomsbury Press.

Robinson, Frank; Anderson, Dave. 1976. *Frank: The First Year*. New York: Holt, Rinehart, and Winston.

Ryan, Bob. 2013. "Tony Conigliaro would have been an all-time great." *The Boston Globe*. August 17. Accessed via bostonglobe.com.

Scully, Gerald W. 1974. "Pay and Performance in Major League Baseball." *American Economic Review* 64:5, pp. 915–30.

Shayo, Moses; Zussman, Asaf. 2011. "Judicial Ingroup Bias in the Shadow of Terrorism." *The Quarterly Journal of Economics* 126:3, pp. 1447-84.

Shayo, Moses; Zussman, Asaf. 2017. "Conflict and the Persistence of Ethnic Bias." *American Economic Journal: Applied Economics* 9:4, pp. 137-65.

Sowell, Mike. 2003. *The Pitch That Killed: The Story of Carl Mays, Ray Chapman, and the Pennant Race of 1920*. Chicago: Ivan R. Dee.

Special to the New York Times. 1948. "Army Segregation to Go, Says Truman." *The New York Times*. July 30, p. 2.

Waggoner, Walter. 1948. "Negroes Propose a 7-Point Plan To Stop Segregation in Services." *The New York Times*. September 30, p. 15.

Williams, Aaron. 2018. "Hate crimes rose the day after Trump was elected, FBI data show." *The Washington Post*. March 23. Accessed via washingtonpost.com.

Figure 1: White Pitcher, Black Batter
Month-by-Month 95% Confidence Intervals

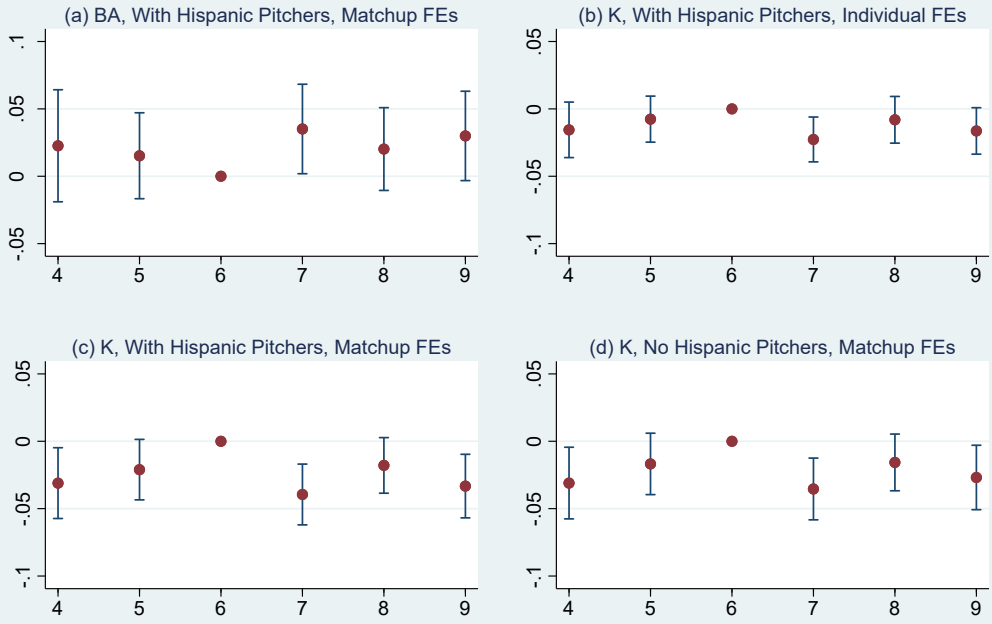

Figure 2: White Southern Pitcher, Black Batter
Month-by-Month 95% Confidence Intervals

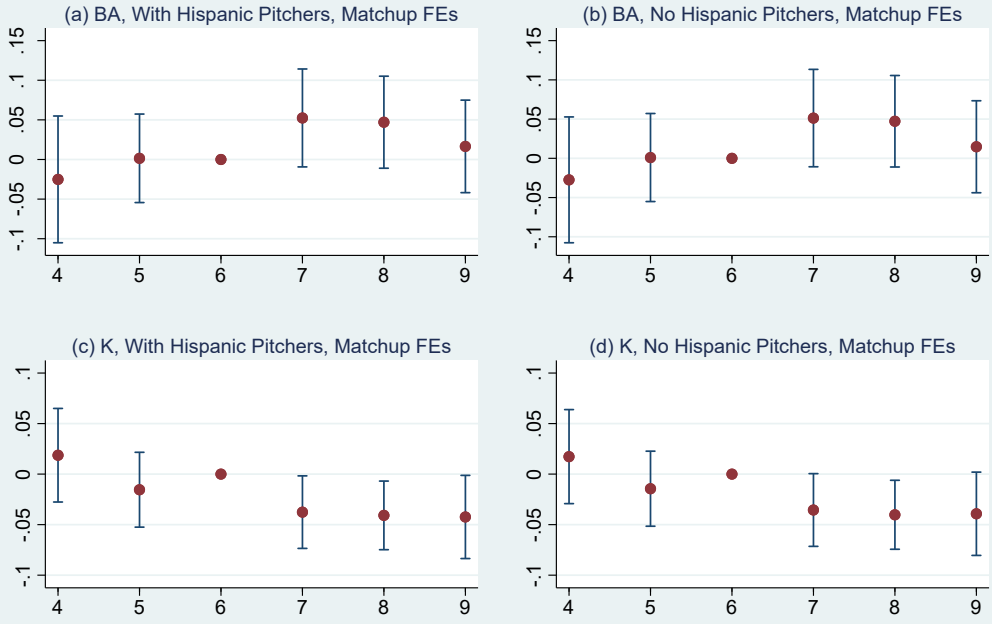

Figure 3: White Pitcher, Black Northern Batter - Batting Average, Month-by-Month 95% Confidence Intervals

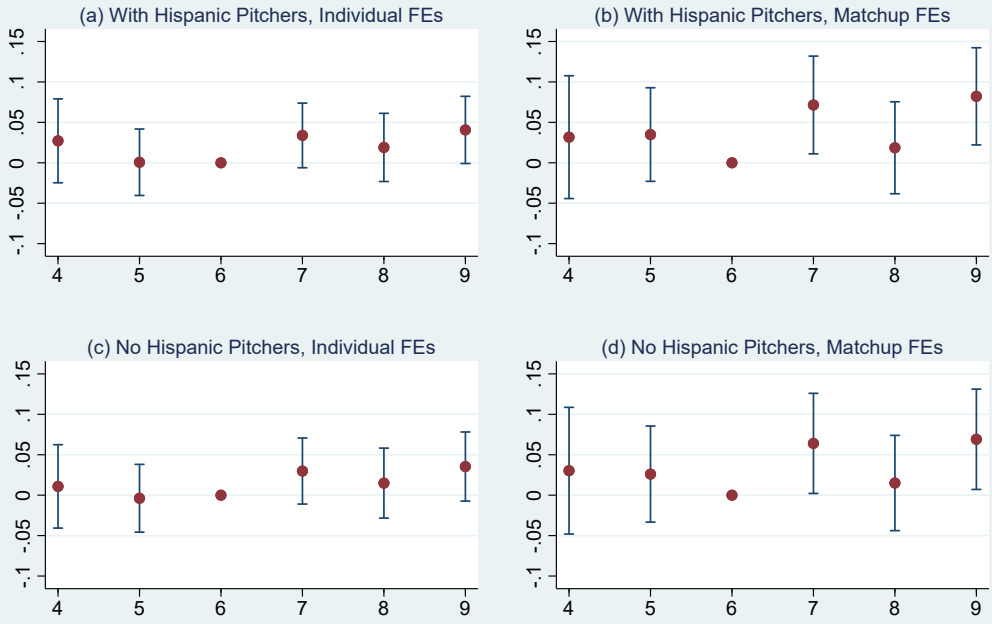

Figure 4: White Pitcher, Black Northern Batter - Strikeout, Month-by-Month 95% Confidence Intervals

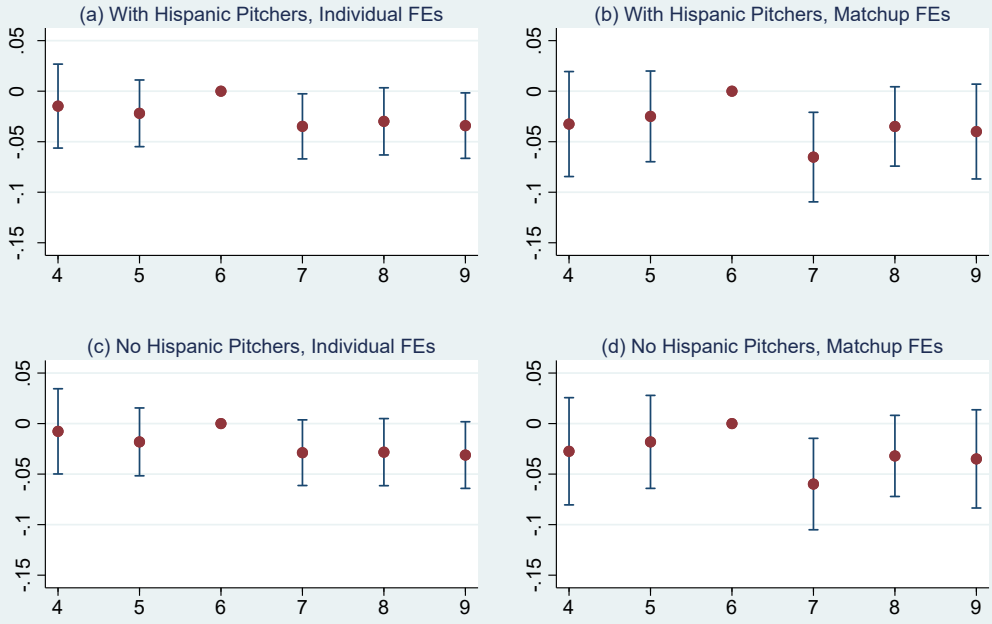

Figure 5: Black Northern Pitcher, Black Southern Batter, HBP
Month-by-Month 95% Confidence Intervals

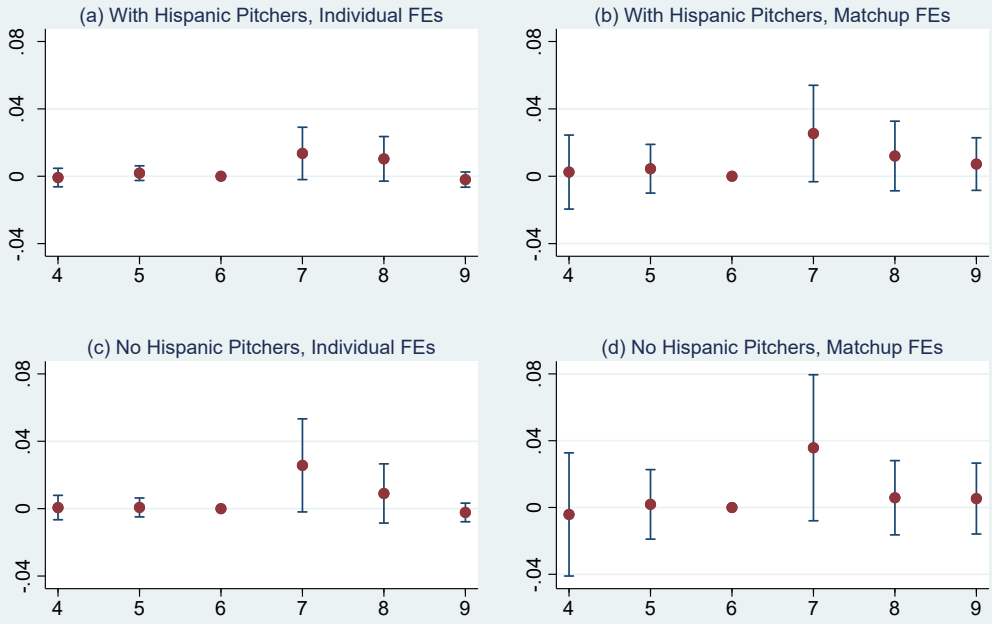

Table 1
Sample means

	(1)	(2)	(3)	(4)
BATTING AVERAGE (BA)	0.255	0.253	0.255	0.254
*STRIKEOUT (K)**	0.153	0.156	0.151	0.154
ACT	0.541	0.534	0.539	0.532
BATTER_HOME	0.488	0.488	0.488	0.488
WHITEPITCH_WHITEBAT	0.644	0.691	0.656	0.704
WHITEPITCH_BLACKBAT	0.262	0.215	0.271	0.223
BLACKPITCH_WHITEBAT	0.066	0.071	0.052	0.055
BLACKPITCH_BLACKBAT	0.028	0.023	0.021	0.017
Observations	108,349	95,751	101,569	89,708
Hispanic Pitchers Included	Yes	Yes	No	No
Hispanic Batters Included	Yes	No	Yes	No
*Observations (K)	122,828	108,828	115,244	102,040

Table 2
Regression results: No Interaction with Region
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BA	BA	BA	BA	K	K	K	K
ACT	0.002	0.004	0.003	0.004	0.004	0.002	0.003	0.001
	[0.004]	[0.005]	[0.004]	[0.005]	[0.003]	[0.004]	[0.003]	[0.004]
*ACT*WHITEPITCH_BLACKBAT*	0.008	0.017*	0.007	0.014	-0.010*	-0.015**	-0.008	-0.013*
	[0.007]	[0.010]	[0.007]	[0.010]	[0.005]	[0.007]	[0.006]	[0.007]
*ACT*BLACKPITCH_WHITEBAT*	-0.021*	-0.017	-0.017	-0.010	-0.006	-0.002	-0.005	-0.002
	[0.011]	[0.015]	[0.013]	[0.017]	[0.009]	[0.011]	[0.010]	[0.013]
*ACT*BLACKPITCH_BLACKBAT*	-0.009	-0.024	0.000	-0.021	-0.007	0.001	-0.003	0.007
	[0.020]	[0.025]	[0.024]	[0.029]	[0.017]	[0.020]	[0.017]	[0.022]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No
Hispanic Batters Included	No	No	No	No	No	No	No	No
N	95751	95751	89708	89708	108828	108828	102040	102040
R-sq	0.030	0.273	0.031	0.276	0.080	0.324	0.082	0.329
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 3
Regression results: Whites Interacted with Region
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BA	BA	BA	BA	K	K	K	K
ACT	0.002	0.004	0.003	0.004	0.005	0.002	0.003	0.001
	[0.004]	[0.005]	[0.004]	[0.005]	[0.003]	[0.004]	[0.003]	[0.004]
*ACT*WHITEPITCHNORTH_BLACKBAT*	0.006	0.011	0.005	0.006	-0.012**	-0.009	-0.010	-0.007
	[0.008]	[0.011]	[0.008]	[0.011]	[0.006]	[0.008]	[0.006]	[0.008]
*ACT*WHITEPITCHSOUTH_BLACKBAT*	0.014	0.039**	0.014	0.038**	-0.005	-0.033***	-0.004	-0.032***
	[0.013]	[0.018]	[0.013]	[0.018]	[0.009]	[0.012]	[0.009]	[0.012]
*ACT*BLACKPITCH_WHITEBATNORTH*	-0.021	-0.003	-0.015	0.004	-0.001	0.008	0.001	0.007
	[0.013]	[0.018]	[0.015]	[0.021]	[0.012]	[0.013]	[0.013]	[0.015]
*ACT*BLACKPITCH_WHITEBATSOUTH*	-0.021	-0.046*	-0.021	-0.041	-0.017	-0.021	-0.020	-0.022
	[0.018]	[0.024]	[0.022]	[0.028]	[0.015]	[0.019]	[0.017]	[0.023]
*ACT*BLACKPITCH_BLACKBAT*	-0.009	-0.024	-0.000	-0.021	-0.007	0.001	-0.003	0.007
	[0.020]	[0.025]	[0.024]	[0.029]	[0.017]	[0.020]	[0.017]	[0.022]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No
Hispanic Batters Included	No	No	No	No	No	No	No	No
N	95751	95751	89708	89708	108828	108828	102040	102040
R-sq	0.030	0.273	0.031	0.276	0.080	0.324	0.082	0.329
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 4
Coefficients on *ACT*WHITEPITCHSOUTH_BLACKBAT* , 1962-66
Hispanic Batters Omitted
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BA	BA	BA	BA	K	K	K	K
1962	-0.013	-0.010	-0.013	-0.010	-0.008	0.005	-0.008	0.006
	[0.014]	[0.020]	[0.014]	[0.020]	[0.010]	[0.013]	[0.010]	[0.013]
1963	0.003	0.021	0.003	0.020	0.006	0.005	0.005	0.005
	[0.014]	[0.018]	[0.014]	[0.018]	[0.009]	[0.012]	[0.010]	[0.012]
1964	**0.014**	**0.039****	**0.014**	**0.038****	**-0.005**	**-0.033****	**-0.004**	**-0.032****
	[0.013]	**[0.018]**	**[0.013]**	**[0.018]**	**[0.009]**	**[0.014]**	**[0.009]**	**[0.014]**
1965	0.005	0.004	0.004	0.004	0.006	0.006	0.005	0.005
	[0.013]	[0.017]	[0.013]	[0.017]	[0.009]	[0.011]	[0.009]	[0.011]
1966	0.000	0.005	-0.000	0.005	0.001	-0.001	0.001	-0.001
	[0.012]	[0.015]	[0.012]	[0.015]	[0.009]	[0.011]	[0.009]	[0.011]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 5
Coefficients on *ACT*WHITEPITCHSOUTH_BLACKBAT* , 1964
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

Panel A: Including Hispanic Pitchers

	(1) BA	(2) K	(3) OBP	(4) SLG	(5) HBP
Individual FEs	0.014	-0.005	0.006	0.007	0.001
	[0.013]	[0.009]	[0.008]	[0.026]	[0.002]
Matchup FEs	0.039**	-0.033***	0.014	0.070**	0.001
	[0.018]	[0.012]	[0.010]	[0.035]	[0.003]

Panel B: Omitting Hispanic Pitchers

	(1) BA	(2) K	(3) OBP	(4) SLG	(5) HBP
Individual FEs	0.014	-0.004	0.004	0.004	0.001
	[0.013]	[0.009]	[0.008]	[0.026]	[0.002]
Matchup FEs	0.038**	-0.032***	0.010	0.065*	0.001
	[0.018]	[0.012]	[0.011]	[0.036]	[0.003]

Table 6
Regression results: Blacks Interacted with Region
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BA	BA	BA	BA	K	K	K	K
ACT	0.002	0.004	0.003	0.004	0.004	0.002	0.003	0.001
	[0.004]	[0.005]	[0.004]	[0.005]	[0.003]	[0.004]	[0.003]	[0.004]
*ACT*WHITEPITCH_BLACKBATNORTH*	0.034**	0.043**	0.034**	0.039**	-0.029***	-0.035***	-0.029***	-0.035***
	[0.013]	[0.019]	[0.014]	[0.020]	[0.010]	[0.013]	[0.011]	[0.014]
*ACT*WHITEPITCH_BLACKBATSOUTH*	0.000	0.010	-0.001	0.007	-0.004	-0.009	-0.002	-0.006
	[0.008]	[0.011]	[0.008]	[0.011]	[0.006]	[0.007]	[0.006]	[0.007]
*ACT*BLACKPITCHNORTH_WHITEBAT*	-0.002	-0.008	0.024	0.018	-0.003	0.003	-0.002	0.003
	[0.014]	[0.019]	[0.018]	[0.024]	[0.013]	[0.015]	[0.016]	[0.019]
*ACT*BLACKPITCHSOUTH_WHITEBAT*	-0.045***	-0.029	-0.045***	-0.029	-0.009	-0.007	-0.008	-0.006
	[0.016]	[0.023]	[0.016]	[0.023]	[0.013]	[0.017]	[0.013]	[0.017]
*ACT*BLACKPITCH_BLACKBAT*	-0.008	-0.024	-0.001	-0.021	-0.008	0.001	-0.003	0.007
	[0.020]	[0.025]	[0.024]	[0.029]	[0.017]	[0.020]	[0.017]	[0.022]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No
Hispanic Batters Included	No	No	No	No	No	No	No	No
N	95751	95751	89708	89708	108828	108828	102040	102040
R-sq	0.030	0.273	0.031	0.276	0.080	0.324	0.082	0.329
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 7
Coefficients on *ACT*WHITEPITCH_BLACKBATNORTH* , 1962-66
Hispanic Batters Omitted
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	BA	BA	BA	BA	K	K	K	K
1962	-0.001	-0.017	-0.000	-0.015	0.000	0.013	-0.002	0.013
	[0.014]	[0.019]	[0.014]	[0.019]	[0.010]	[0.012]	[0.010]	[0.012]
1963	0.016	0.009	0.013	0.008	0.014	0.025*	0.012	0.022
	[0.015]	[0.021]	[0.015]	[0.022]	[0.011]	[0.015]	[0.011]	[0.015]
1964	**0.034****	**0.043****	**0.034****	**0.039****	**-0.029*****	**-0.035*****	**-0.029*****	**-0.035*****
	[0.013]	**[0.019]**	**[0.014]**	**[0.020]**	**[0.010]**	**[0.013]**	**[0.011]**	**[0.014]**
1965	0.011	-0.006	0.012	-0.006	-0.015	-0.021	-0.017	-0.022
	[0.014]	[0.020]	[0.015]	[0.020]	[0.011]	[0.014]	[0.011]	[0.014]
1966	0.002	0.002	-0.001	0.004	-0.006	-0.025*	-0.007	-0.028**
	[0.014]	[0.020]	[0.014]	[0.020]	[0.011]	[0.014]	[0.011]	[0.014]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes

Table 8
Coefficients on *ACT*WHITEPITCH_BLACKBATNORTH* , 1964
Hispanic batters omitted
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

Panel A: Including Hispanic Pitchers

	(1) BA	(2) K	(3) OBP	(4) SLG	(5) HBP
Individual FEs	0.034**	-0.029***	0.031**	0.034	-0.003
	[0.013]	[0.010]	[0.014]	[0.025]	[0.002]
Matchup FEs	0.043**	-0.035***	0.036*	0.074**	-0.000
	[0.019]	[0.013]	[0.019]	[0.035]	[0.003]

Panel B: Omitting Hispanic Pitchers

	(1) BA	(2) K	(3) OBP	(4) SLG	(5) HBP
Individual FEs	0.034**	-0.029***	0.030**	0.032	-0.003
	[0.014]	[0.011]	[0.014]	[0.026]	[0.002]
Matchup FEs	0.039**	-0.035***	0.034*	0.065*	0.000
	[0.020]	[0.014]	[0.019]	[0.036]	[0.003]

Table 9
Regression results - Whites and Blacks Interacted With Region
Full 1964 Season
***: Significant at 1% level; **: Significant at 5% level; *: Significant at 10% level
Robust standard errors in brackets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	BA	BA	BA	BA	K	K	K	K	HBP	HBP	HBP	HBP
ACT	0.000	-0.005	0.003	-0.002	0.004	0.004	0.001	0.001	-0.001	-0.001	-0.001	-0.001
	[0.005]	[0.007]	[0.005]	[0.007]	[0.004]	[0.005]	[0.004]	[0.005]	[0.001]	[0.001]	[0.001]	[0.001]
*ACT*WHITEPITCHNORTH_WHITEBATSOUTH*	0.004	0.018	-0.004	0.012	0.003	-0.002	0.005	-0.002	0.002	0.002	0.002	0.002
	[0.009]	[0.012]	[0.009]	[0.012]	[0.006]	[0.008]	[0.007]	[0.008]	[0.001]	[0.002]	[0.001]	[0.002]
*ACT*WHITEPITCHSOUTH_WHITEBATNORTH*	0.008	0.027*	0.006	0.025*	0.005	-0.006	0.007	-0.004	-0.002	0.001	-0.002	0.001
	[0.010]	[0.015]	[0.010]	[0.015]	[0.008]	[0.011]	[0.008]	[0.011]	[0.002]	[0.002]	[0.002]	[0.002]
*ACT*WHITEPITCHSOUTH_WHITEBATSOUTH*	-0.004	-0.004	-0.006	-0.006	-0.006	0.000	-0.004	0.002	0.003	0.003	0.004*	0.003
	[0.014]	[0.019]	[0.014]	[0.019]	[0.011]	[0.014]	[0.011]	[0.014]	[0.002]	[0.003]	[0.002]	[0.003]
*ACT*WHITEPITCHNORTH_BLACKBATNORTH*	0.036**	0.041*	0.034**	0.034	-0.027**	-0.033**	-0.026**	-0.033**	-0.003	0.000	-0.003	0.000
	[0.016]	[0.022]	[0.016]	[0.023]	[0.012]	[0.015]	[0.012]	[0.016]	[0.002]	[0.003]	[0.003]	[0.003]
*ACT*WHITEPITCHNORTH_BLACKBATSOUTH*	-0.000	0.012	-0.005	0.007	-0.006	-0.004	-0.002	0.000	-0.001	0.001	-0.001	0.001
	[0.010]	[0.012]	[0.010]	[0.013]	[0.007]	[0.009]	[0.007]	[0.009]	[0.002]	[0.002]	[0.002]	[0.002]
*ACT*WHITEPITCHSOUTH_BLACKBATNORTH*	0.036	0.086**	0.033	0.083**	-0.030	-0.048*	-0.028	-0.045*	-0.002	0.003	-0.001	0.003
	[0.027]	[0.038]	[0.027]	[0.038]	[0.021]	[0.027]	[0.021]	[0.027]	[0.004]	[0.006]	[0.004]	[0.006]
*ACT*WHITEPITCHSOUTH_BLACKBATSOUTH*	0.011	0.036*	0.008	0.034	0.005	-0.031**	0.007	-0.029**	0.002	0.001	0.002	0.001
	[0.016]	[0.021]	[0.016]	[0.021]	[0.011]	[0.013]	[0.011]	[0.013]	[0.003]	[0.004]	[0.003]	[0.004]
*ACT*BLACKPITCHNORTH_WHITEBATNORTH*	-0.005	0.017	0.019	0.041	0.003	0.007	0.009	0.006	0.001	0.004	0.001	0.004
	[0.018]	[0.024]	[0.023]	[0.031]	[0.017]	[0.019]	[0.021]	[0.023]	[0.002]	[0.003]	[0.003]	[0.004]
*ACT*BLACKPITCHNORTH_WHITEBATSOUTH*	0.010	-0.031	0.036	-0.014	-0.011	-0.010	-0.018	-0.004	-0.001	-0.006	-0.004	-0.010
	[0.025]	[0.029]	[0.036]	[0.040]	[0.020]	[0.024]	[0.027]	[0.033]	[0.004]	[0.005]	[0.006]	[0.007]
*ACT*BLACKPITCHSOUTH_WHITEBATNORTH*	-0.037*	-0.009	-0.040**	-0.011	-0.003	0.005	-0.001	0.007	0.001	-0.001	0.001	-0.000
	[0.020]	[0.028]	[0.020]	[0.028]	[0.016]	[0.019]	[0.016]	[0.019]	[0.002]	[0.002]	[0.002]	[0.002]
*ACT*BLACKPITCHSOUTH_WHITEBATSOUTH*	-0.057**	-0.046	-0.060**	-0.049	-0.017	-0.039	-0.015	-0.037	0.001	0.004	0.001	0.004
	[0.028]	[0.039]	[0.028]	[0.039]	[0.023]	[0.031]	[0.023]	[0.032]	[0.003]	[0.003]	[0.003]	[0.003]
*ACT*BLACKPITCHNORTH_BLACKBATNORTH*	0.044	-0.028	0.118*	0.070	-0.066	0.013	-0.123*	-0.044	0.003	0.002	0.005	0.003
	[0.046]	[0.057]	[0.064]	[0.073]	[0.051]	[0.056]	[0.069]	[0.090]	[0.004]	[0.002]	[0.009]	[0.003]
*ACT*BLACKPITCHNORTH_BLACKBATSOUTH*	-0.024	-0.006	-0.026	-0.023	0.007	-0.032	0.032	-0.012	0.007**	0.013**	0.011*	0.016*
	[0.030]	[0.037]	[0.040]	[0.047]	[0.026]	[0.027]	[0.027]	[0.032]	[0.003]	[0.007]	[0.006]	[0.009]
*ACT*BLACKPITCHSOUTH_BLACKBATNORTH*	-0.045	-0.108	-0.049	-0.110	0.052	0.102	0.056	0.104	0.001	0.001	0.001	0.001
	[0.066]	[0.075]	[0.066]	[0.075]	[0.046]	[0.068]	[0.046]	[0.068]	[0.001]	[0.001]	[0.001]	[0.001]
*ACT*BLACKPITCHSOUTH_BLACKBATSOUTH*	0.008	0.001	0.007	-0.002	-0.015	0.002	-0.015	0.004	0.001	0.002	0.001	0.002
	[0.037]	[0.045]	[0.037]	[0.045]	[0.026]	[0.033]	[0.026]	[0.033]	[0.004]	[0.007]	[0.004]	[0.007]
Hispanic Pitchers Included	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
Hispanic Batters Included	No	No	No	No	No	No	No	No	No	No	No	No
N	95751	95751	89708	89708	108828	108828	102040	102040	108828	108828	102040	102040
R-sq	0.030	0.273	0.031	0.276	0.080	0.324	0.082	0.329	0.022	0.261	0.023	0.261
Individual Fixed Effects	Yes	-	Yes	-	Yes	-	Yes	-	Yes	-	Yes	-
Matchup Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes