

Racial Disparities in Judicial Outcomes, and Human Behavior

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October 2021

This paper is written for the 64th Annual Economic Conference of the Boston Fed on Racial Disparities in Today's Economy. I thank Philip Marx, Murat Iyigun, and Eric Osborne for valuable comments. All errors and omissions are mine.

Racial Disparities in Judicial Outcomes and Human Behavior

I. Introduction

It has frequently been argued that racial disparities in judicial outcomes in the U.S. contradict the “Equal Justice under Law” proclamation etched on the façade of the United States Supreme Courthouse. For example, even though blacks constitute 13 percent of the U.S. population, they are more than five times as likely to be incarcerated in comparison to whites.¹ Such raw disparities, of course, are not are terribly informative. Although they may reflect racial bias, raw disparities could also mask other underlying race-specific biases. Furthermore, the lack of a raw disparity does not necessarily imply the lack of racial bias. In the first part of this paper, I will briefly summarize the body of knowledge regarding racial disparities in judicial outcomes, and in the remainder of the paper I will focus on some important determinants of judicial biases which only recently started receiving attention.

Consider the table below which displays a hypothetical scenario where a judge makes conviction decisions on black and white defendants. The first row indicates that there are 100 white defendants, and the second row shows that there are 200 black defendants assigned to this judge. Assume that all of the defendants are accused of the same type of offense, they all have the same case attributes, and they all have same

¹ Imprisonment rate (the number of prisoners sentenced to more than one year under state or federal jurisdictions per 100,000 U.S. residents age 18 or older) is 1,134 among blacks, while it is 218 among Whites (U.S. Department of Justice, Bureau of Justice Statistics, Prisoners in 2018, Table 5, April 2020, NCJ 253516)

SCENARIO 1

	Conviction/Acquittal Decisions of a Judge
WHITE DEFENDANTS (N=100)	Probability of Conviction= 0.50
BLACK DEFENDANTS (N= 200)	Probability of Conviction= 0.50

criminal history. Both white and black defendants are equally likely to be convicted with 50 percent probability. Nevertheless, because there are 100 white defendants but 200 black defendants in front of the judge, 50 white defendants will be convicted in contrast to 100 black defendants. Thus, a larger number of black defendants will be imprisoned despite the racially unbiased decisions of the judge.

The number of black defendants in front of the judge could be larger than the number of white defendants because of a variety of reasons. First, the crime commission rate is higher among blacks in comparison to whites.² The higher rate of criminal activity for blacks, especially for property crime, may be attributed to the relatively limited labor market opportunities and lower market wages, which in turn could be the result of lower levels of education, labor market discrimination, or a number of other factors unrelated to the criminal justice system. Second, the behavior of the police may lead to a larger number of black defendants in the courtroom in comparison to white defendants. Even if the offending rate is the same between whites and blacks, if black individuals are treated

² For instance, black arrests for murder and non-negligent manslaughter constitute 51.2 percent of all arrests in this crime category. Black robbery arrests make up 52.7 percent of all robbery arrests, and arrests of black suspects of larceny-theft constitute 30.3 percent of all larceny-theft arrests. (Crime in the United States, FBI, 2019; <https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/tables/table-43>). National Crime Victimization Survey indicates that 25 percent of violent incidents are committed by black perpetrators (Bureau of Justice Statistics Criminal Victimization 2019, Table 13)

less favorably by the police, they will appear in a courtroom more frequently.³ Third, the behavior of prosecutors may lead to disproportioned representation of blacks as defendants in courtrooms. For example, this could be the case if prosecutors file differential charges between white black arrestees (Rehavi and Starr 2014, Yang 2015)

Now consider Scenario 2 in the table below. Continue to assume that the attributes of all defendants are the same. In this scenario there are equal numbers of white and black defendants in front of the judge. However, defendants of different races have different probabilities of conviction. While the judge convicts white defendants 40 percent of the time, the probability of convictions for black defendants is 50 percent.

SCENARIO 2

	Conviction/Acquittal Decisions of a JUDGE
WHITE DEFENDANTS (N=100)	Probability of Conviction= 0.40
BLACK DEFENDANTS (N= 100)	Probability of Conviction= 0.50

This scenario would also lead to a larger number of black defendants in prison compared to whites (50 Black prisoners vs. 40 white prisoners), but again, this does not imply that the judge, who convicts black defendants at a higher rate, is racially biased against blacks. This is because the differential outcome between white and black defendants could be the reflection of a different actor of the judicial system. For example, it has been documented that assigned counsel (private attorneys who are hired by the government on an hourly basis to represent assigned to indigent defenders) produces worse judicial outcomes for their clients in comparison to public defendants, and that the

³ See Fryer 2019, Antonovics and Knight 2009, Persico and Todd 2006, Anwar and Fang 2006, and Knowles, Persico and Todd 2001, for a collection of papers with divergent results on this topic.

disparities in case outcomes (conviction probability and sentence length) can be explained by difference in the attorney quality and effort (Agan et al. 2012, Cohen 2014, Roach 2014, Anderson and Heaton 2012). More generally, to the extent that black defendants have lower levels of income and wealth in comparison to white defendants, black defendants will have less favorable judicial outcomes related to the quality of the defense attorney.⁴

The upshot is that, criminal justice process is multi-layered. Before a case arrives at the bench of the judge, it goes through a multi-step process, involving other actors such as bail judges, prosecutors and criminal defense attorneys. Thus, the ultimate decisions made by judges are influenced by the decisions made by these other actors. For example, suppose prosecutors are racially biased and they prosecute cases against minorities with more diligence and with more aggressiveness. In this case, a racial disparity in the conviction rate and the prison sentence may emerge even if judges themselves are racially unbiased. Alternatively, racially-unbiased prosecutors may adjust their behavior in how they handle cases based on the race of the defendant if they recognize that judges are racially biased. In addition, difficult-to-observe personal attributes of the defendants, which may be correlated with race (such as income, family background, and wealth) may be important elements of these actions.

These examples underline the many challenges in investigating judicial bias. But researchers have long recognized the need to take into account the institutional details of the judicial system, and they have considered and adjusted for the implications of the decisions made at earlier stages of the process. Thus, a large literature on judicial

⁴ Median household income for black households was \$45,400 in 2019, while it was \$72,200 for white households (U.S. Department of Commerce, Census Bureau, 2021).

decisions has focused on the actions/decisions of each decision-maker in the judicial system separately, while accounting for the fact that one actor's decision may impact the decisions of other actors, and that these decisions may be interdependent.

II. What Do We Know About the Source of Racial Disparities?

Over the last decade, a number of sophisticated analyses in economics and political science, taking into account the complicated factors described above, have identified racial disparities in judicial decisions which cannot be easily attributable to the behaviors of other actors of the judicial system. More specifically, the scenario described in Table 2 above seems to be relevant in a general sense, even after adjusting for many factors related to the conviction and sentencing decisions. (Arnold, Dobbie and Yang 2018, Alesina and Ferrara 2014, Mustard 2001)⁵ Thus, at this juncture of scientific inquiry, the interesting question seems to be: “What is the source of the racial bias identified in judicial decisions? Are judges harsher against black defendants because of racial animus, because of racial stereotyping (i.e. judges might believe that blacks are more likely to commit a crime and re-offend after release) or because of some other belief or reason?

This question is obviously important, but its essence is embedded in a bigger inquiry related to human nature: When people evaluate and judge others, what factors come into play and why?

To answer this question, one first needs to investigate disparities in judicial decision-making more broadly. Specifically, one needs to ask (1) Whether judicial disparities exist only in the race of the defendant, or do they also exist in other defendant

⁵ Similar analyses identified racial differences on outcomes attributable to prosecutorial decisions.

attributes? (2) Whether judicial outcomes are impacted by extrajudicial factors which are unrelated to defendant characteristics, but which are connected to judges. For example, do personal attributes of judges, such as their sex or political affiliation, influence their decisions? (3) Whether idiosyncratic external events, which are unrelated to the merits of the case, nevertheless impact judicial decisions in a systematic way?

It turns out that the answers to all of these questions are in the affirmative. For example, Starr (2015) identified large gender gaps in sentencing in favor of women. A similar gender gap in sentencing is reported in France (Philippe 2020). Eren and Mocan (2021) show that female judges are tougher against male juveniles compared to female juveniles. The same is true for state governors in their decisions to commute the sentences of death row inmates (Argys and Mocan 2004). All else the same, federal judges appointed by Republican Presidents are harsher towards black defendants, but they are more lenient towards female defendants compared to Democratic-appointed judges (Cohen and Yang 2019). Analyzing data from the U.S. Courts of Appeals, Sunstein et al. (2006) showed that judges who were Democratic appointees voted in a more liberal fashion in comparison to judges who were appointed by Republicans. Glynn and Sen (2015) found that Appellate Court judges who have daughters consistently voted in a feminist direction. Knepper (2018) showed that female plaintiffs who filed sex discrimination cases with the Equal Employment Opportunity Commission were more likely to win their cases in federal district courts if a female judge was assigned to the case. Boyd et al. (201) find that female judges are more likely to decide in favor of the party alleging sex discrimination.

Emotions also play a role in judicial decisions. Chen and Philippe (2019) found that, in France, if the date on which the judge made his/her decision happened to be the birthday of the defendant, the sentence was reduced by three percent. Eren and Mocan (2018), reported that if the sentencing date in juvenile court cases in Louisiana happened to be during the week following a surprise loss of the Louisiana State University (LSU) football team, defendants received longer sentences—and this impact was driven by judges who received their undergraduate degrees from LSU.

As I describe in the following sections, the interplay between these factors is important as well. An example is the question of whether a match between the defendant and the judge in terms of their race or their sex influences judicial decisions. More generally, although legal formalism suggests that the facts of a case, the fundamental principles of judicial decision making, and the letter of the law should determine judicial outcomes, it has long been argued by legal realists that attributes of judges, ranging from life experiences to ideological beliefs, can have an impact on judicial decisions. Legal scholars discuss the factors that influence judges' motivations in her judicial decisions (Epstein and Knight 2013, Posner 2008). The findings summarized above indicate that judges, as human beings, are impacted by a variety of factors, and it is not a straightforward exercise to identify the most significant underlying factor that determines judicial decisions, and how the impact of that factor varies between groups of individuals.

III. In-group Bias

A directly related line of research, which is important to shed light on the underlying mechanism that leads to discrepancies in judicial outcomes is the analysis of whether decision makers treat member of their own group differently compared to others, where own group (or “the in-group”) may be defined by race, gender or some other classification. This inquiry is related to the connection between questions (1) and (2) posed in the previous section. That is, what is the interplay between the personal attributes of the defendants and judges?

It turns out that it is critically important to analyze whether judges treat defendants “who are like them” differently. This is because of at least two reasons. First, such in-group favoritism may mask an overall bias. Second, analysis of in-group bias can shed light on the group driving the bias. To see this point, consider Scenario 3 in the table below. In this example there is one black judge and one white judge, and there are black and white defendants. The white judge makes conviction decisions on 100 white and on 100 black defendants. The black judge has also 200 defendants; half of them are white, the other half are black. The white judge convicts Black defendants 50 percent of the time, but he is more lenient on white defendants whose conviction probability is only 30 percent. The reverse is true for the Black judge, who convicts 30 percent of Black defendants, but his probability of conviction for white defendants is 50 percent. In this scenario both black and white judges exhibit positive in-group bias. That is, both black and white judges are more lenient towards defendants of their own race. But in the end, 80 of the 200 white defendants are convicted (30 of them are convicted by the white judge and 50 of them are convicted by the black judge). Similarly, 80 of the 200 black

defendants are convicted (50 by the white judges and 30 by the black judge). Thus, the overall conviction rate is the same between white and black defendants, (40 percent), which gives the impression of the absence of any bias, when in fact this result emerges only because two in-group biases cancel each other in the aggregate.

SCENARIO 3

Total Number of Defendants =400	Probability of Conviction by	
	White Judge	Black Judge
WHITE DEFENDANTS (N=200)	0.3 (100 white defendants)	0.5 (100 white defendants)
BLACK DEFENDANTS (N=200)	0.5 (100 Black defendants)	0.3 (100 Black defendants)
Overall Conviction Rate of White Defendants=0.4		
Overall Conviction Rate of Black Defendants=0.4		

Now consider Scenario 4. Here, as before, each judge handles 200 cases (100 white and 100 black defendants), but the number of judges is different. There are four white judges and one black judge. In this example both white and black judges exhibit in-group bias, but the bias is stronger in case of the black judge, whose conviction rate is 30 percent for black defendants but 50 percent for white defendants. White judges have a smaller wedge in their race-specific conviction rates: they convict 40 percent of the white defendants and 50 percent of the black defendants. This scenario would generate a total of 210 white defendants being convicted out of 500. On the other hand, 230 of 500 black defendants would be convicted. Thus, the conviction rates of whites would be 42 percent, while the conviction rate of blacks would be 46 percent. This means that even though in-group bias is stronger for black judges in comparison to white judges, the data would suggest overall bias against black defenders. This picture emerges because a larger

number of cases are adjudicated by white judges.

SCENARIO 4

Total Number of Defendants =1,000	Probability of Conviction by	
	White Judges N=4	Black Judges N=1
	(I)	(II)
WHITE DEFENDANTS (N=500)	0.4 (400 white defendants)	0.5 (100 white defendants)
BLACK DEFENDANTS (N=500)	0.5 (400 Black defendants)	0.3 (100 Black defendants)
Overall Conviction Rate of White Defendants= $(210/500) = 0.42$		
Overall Conviction Rate of Black Defendants= $(230/500) = 0.46$		

Although there are examples of negative in-group bias (where decision-makers treat people of their in-group more harshly), the majority of the literature reports positive in-group bias both in laboratory experiments and in the field.⁶ For example, Shayo and Zussman (2011) analyzed data from Israeli small claims courts, and showed that a claim was more likely to be accepted if assigned to a judge who was of the same ethnicity as the plaintiff. Similarly Gazal-Ayal and Sulitzeanu-Kenan (2010 JELS) found in-group bias in Israeli Arab and Jewish judges' decisions on criminal cases. Bielen, Mocan and Marneffe (2021) documented significant in-group bias among Belgian law students and economics

⁶ For example, Depew, Eren and Mocan (2017) found that Louisiana juvenile court judges assign longer sentences to defendants who are of the same race as them. This could be because judges are elected in Louisiana and therefore they may be avoiding giving the impression to the voters of favoring their own race, and thus they may go overboard. Another explanation could be that a minority evaluator might consider a defendant of that minority group as a representative of the group. In that case, the evaluator might be harsher towards the defendant for badly representing the group for just being put in front of the judge, and this sentiment can translate into convicting the defendant even if the case against him in the court hearing may not have been very strong (Goette et al. 2012, AEJ, Bernhard et al. 2006) Negative in-group bias that can be attributed to this effect has also been detected in lab experiments where in- group members have violated a social norm (Mendoza et al. 2014, Goette et al. 2006)

students when making conviction and sentencing decisions. Bar and Zussman (2020) found ethnic in-group bias in between Arabs and Israelis in the decisions of the evaluators of driving tests in Israel.

IV. What is the Reason for In-group Bias?

Recent research in experimental psychology sheds light on potential foundations of in-group bias. This fascinating work suggests that the reason for in-group bias is not hatred of others, but instead people' inborn compassion and empathy for those who look like themselves. Surprising insights are obtained from experiments done with young children, infants and babies around the world. For example, in-group bias in punishment was detected among 6 year old children (Jordan, McAuliffe and Warneken 2014), and in-group preference is observed in 5 year old children (see Dunham et al. 2011, and the literature they cite). Infants as young as 3 months old demonstrated a significant visual preference for faces from their own ethnic groups (Kelly, et al. 2005), and own race (Bar-Haim et al. 2006, Kelly et al. 2007). Infants prefer speakers of their native language (Kinzler, Dupoux and Spelke 2007).

Mahajan and Wynn (2012) indicate that a central feature of human psychology is humans' pervasive tendency to divide their social world into "us" and "them" and to hold more positive beliefs about those who are similar. The authors show that independent of "familiarity", infants demonstrate social preferences based on "similarity to self." Hamlin et al. 2013) find that infants treat similar others well and they treat dissimilar others poorly.

Along the same lines, a striking line of experimental research in social psychology has shown that when people are randomly assigned to “minimal” groups where group members have no particular reason to favor the members of their group other than mere categorical distinction from the out-group, such meaningless social groupings produce in-group preferences. (see Tajfel et al. 1971 and Muzafer et al. 1961 for the origin of social identity theory which emerged following early experiments in minimal grouping). Once the notion of ‘group’ was introduced, the subjects discriminated against those assigned to another random category (Billig and Tajfel 1973). Economists also confirmed this insight (Bernhard, Fehr and Fischbacher 2006, Chen and Li, 2009, Goette, Huffman and Meier 2012).

The reasons for such natural compassion toward one’s own group can be attributed to the forces of evolutionary biology. Psychologist Paul Bloom (2013, p.108) states that

“.. A focus on race could be a by-product of an evolved interest in who is and who isn’t family. Kin has always mattered; it makes perfect Darwinian sense to favor someone who looks like you, because that individual is likely to share more of your genes. Instead of being a proxy for coalition, then, race could be a proxy for kinship.”

V. Another Layer: Peer Effects

An example of the impact of the interplay between the attributes of the decision-makers and external factors, mentioned in Section II, is the influence of peers. For example, De Paola and Scoppa (2017) showed that the promotion of females is less likely if the panel of decision-makers consists of exclusively males, but that the gender gap disappears if there is one female member of a five-member panel. Anwar et al. (2012)

reported that, in Florida, black defendants are more likely to be found guilty by a jury if the jury pool contains only white individuals. Kastellec (2013) found that randomly assigning a black judge to a three judge panel of the Courts of Appeals almost ensures that the panel will vote in favor of an affirmative action program. Eren and Mocan (2021) showed that an increase in the proportion of female peers in the courthouse generates an increase in female judges' propensity to incarcerate and leads to longer sentences.

The main takeaway from these findings is that judicial decisions are complex functions of judges' perceptions and interpretations of the context, their emotions as well as their own identity, and there is evidence indicating that evolutionary biology could be a primary force leading to behaviors driven by implicit biases.

VI. A Final Complication

A final complication pertains to the lack of a clear yardstick with which to evaluate these disparities. Research on judicial disparities identifies relative differences between groups, because typically there is no benchmark to which the results can be anchored. For example, if research points out that judges assign longer sentences to black defendants in comparison to whites, this tells us that judges are relatively harsher towards blacks, but it does not tell us whether whites are receiving lenient sentences in comparison to what they should have received, or whether blacks are receiving stiffer sentences than what should have been assigned.

This is important in the search of the underlying root causes such as racial animus, the dictionary definition of which is “a usually prejudiced and often spiteful or malevolent ill will.” To make this point clear, assume that the “optimal” or typical

sentence of a particular crime is a 12 month prison term. Assume, however, that a judge assigns convicted white defendants 4 months, and black defendants receive a sentence of 5 months from the same judge. Now compare this to a situation in which a judge sentences white defendants to 10 months (which is below the standard sentence), but assigns 14 months of prison term (which is above the judicial norm for that particular crime) to black defendants. Finally consider a situation where the judge hands down 24-month prison terms to white defendants, and 26-month terms to black defendants for the crime that deserves a 12 month prison term. The first judge is lenient towards all defendants, but he is more lenient towards white defendants. The third judge is harsh towards all defendants but she is harsher towards blacks. The second judge assigns sentences to the white defendants which are shorter than the standard, but he assigns sentences to black defendants which are longer than the standard benchmark. It would arguably be a mistake to label each one of these scenarios as being (equally) driven by malevolent ill will against black defendants. The upshot here is that, it is important to discern what the “optimal decision” is, but this is typically unknown.

Related to this point, it is generally not possible to determine whether convictions and acquittals were wrongful. In other words, in the overwhelming majority of cases, it is unknown whether the judge made a Type-I error in her decision (convicting an innocent person), or a Type-II error (acquitting a guilty person). This is important because the behavior of judges, based on such parameters as their risk aversion, concerns for public safety and so on can, increase the error rate of their decisions in one direction or the other.⁷

⁷ For example, Philippe and Ouss (2018) found that in France sentences are 3 months longer when there was news coverage of local crime before the verdict. Asadi (2021) shows that immigration

VII. A Quizi-Judicial Context: NBA Referees as Judges

In a new research paper, Mocan and Osborne (2021) shed new light on some of these issues. They analyze the decisions of NBA referees who, much like judges, evaluate “cases” in front of them and make judgement calls to declare the potential offender either guilty or innocent. Put differently, referees make conviction or acquittal decision based on what they observe in front of them. Similar to judges, these referees are highly-experienced professionals who operate within well-defined rules that guide their decisions. The paper focuses on decisions made during the last two minutes of close games. They are high-stakes decisions with consequences about the game outcomes. They are also high-stakes decisions for the decision maker because the accuracy of these decisions are evaluated by the NBA, and these assessments impact referees’ future assignments and compensation.⁸

There are a number of advantages to the analysis of Mocan and Osborne (2021). Most importantly, NBA’s assessment of the accuracy of referee decisions allows the authors to determine the Type I and Type II errors in these decisions. More specifically, the authors evaluate the determinants of wrongful convictions (the referee blowing the whistle to call a foul, when there was no foul on the play) and wrongful acquittals (the referee letting the play continue when in fact the player committed a foul). Second, the authors are able to analyze the impact of the decision-makers’ peers on these decisions. Although there exist research on the impact of the peer composition of a panel (e.g. a

judges are less likely to grant asylum if there was a terrorist attack during the 60 day period before the decision. These results may be a reflection of judges’ enhanced concerns about public safety and their updated calculus about the tradeoff between making a Type I vs. Type II errors.

⁸ <https://www.usatoday.com/story/sports/nba/2019/04/12/how-nba-selects-its-playoff-refs/3435412002/>

panel of three judges) on the decisions made by the panel, there is paucity of research on how judges' solo-decisions (bench decisions) are influenced by the variation of their peer composition in the courthouse (an exception is Eren and Mocan 2021). The analysis of the judgements of the NBA referees and the extent to which these judgements are influenced by the composition of their peers (the other referees on the court) brings new insights into the impact of peers on individuals' evaluations and judgments of others.

Another advantage of investigating the decisions of the NBA referees is the large share of black individuals among these decision makers. In most settings of judicial analyses, the proportion of black judges is small, which limits the power of these analyses.

Mocan and Osborne (2021) analyze the last two minutes all NBA games between 2015 and 2019 seasons (1,482 games), focusing on the last two minutes of close games (where the teams were within three points of each other at any point during these last two minutes.) These games are reviewed by NBA's League Operations' senior management team. All decisions of the referees during the last two minutes are evaluated. The observers identify the offending player and the disadvantaged player (if there is one) and determine the correctness of the call or non-call. There were 81 referees who officiated these games, and 43 of these referees were black. These referees made 16,129 decisions involving 590 unique players, 462 of whom (78 percent) were black. Figure 1 summarizes the key components of their analysis.

The authors first estimate referees' probability of calling a foul (convicting the "committing player") holding constant all player characteristics (ranging from the position of the player, to very detailed performance measures in the season) game attributes (e.g. home vs. away game, playoff game), the race of the coach, and the race of the

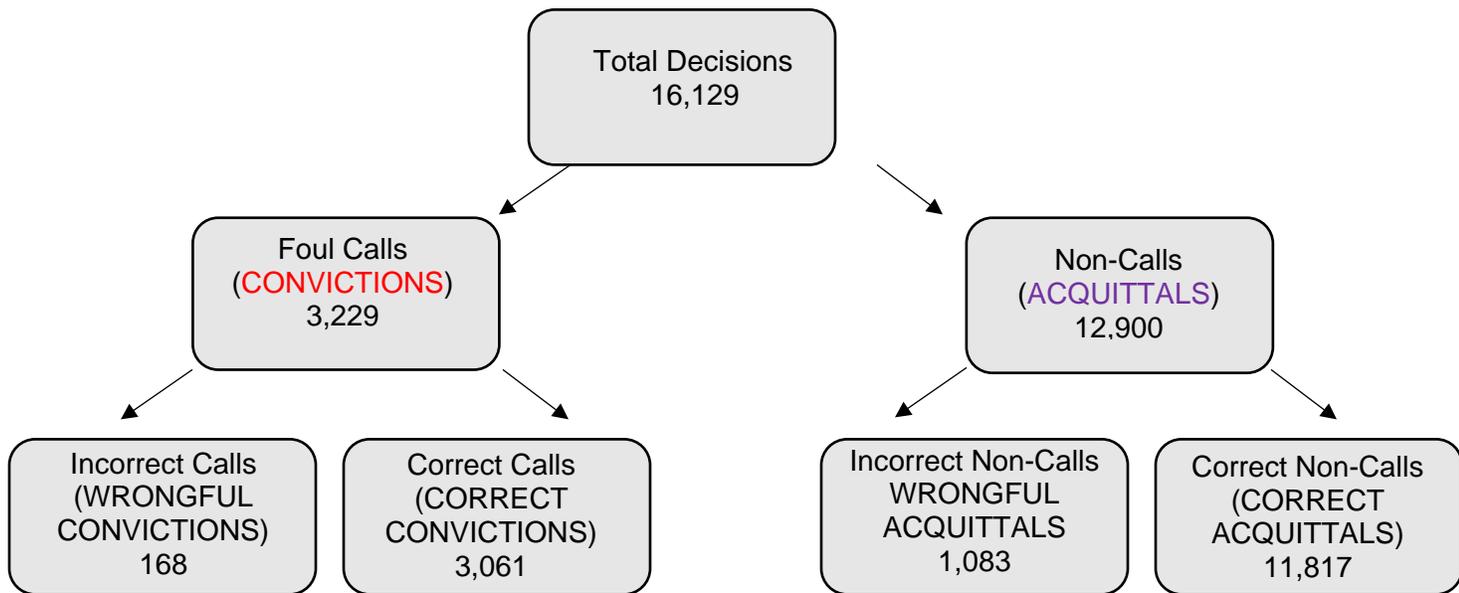
disadvantaged player (the “victim”), and dichotomous indicators for each referee. The authors find that the impact of being a black player on the probability of receiving a foul call is not different from zero. This means that there is no indication of racial bias in foul calls (convictions) against black players.

Recall that the NBA has assessed whether the decisions made by the referees were correct or incorrect. This means that it has been determined whether each foul call was made correctly or incorrectly (correct vs. incorrect convictions) and whether a non-call was correct or incorrect (correct vs incorrect acquittals). This information allows the authors to analyze potential racial bias in Type I vs. Type II errors. Put differently, the authors are able to ask whether the referee’s propensity to make a wrongful conviction (making an incorrect foul call), or their propensity to acquit incorrectly (not calling the foul) depends on the race of the player who was judged by the referee.

The result of this investigation reveals no racial bias either. The estimated coefficient of the indicator for black player is very small and not statistically different from zero in the analysis that separates wrongful convictions from correct convictions (the two boxes on the left-hand-side of the bottom row in Figure 1).⁹

⁹ The proviso here is that there are very few incorrect calls to have power to determine bias.

Figure 1



Similarly, the race of the player has no role when analyzing the factors that separate wrongful acquittals from correct acquittals (the two boxes on the right-hand-side of the bottom row in Figure 1). Thus, there is no evidence of any overall racial bias in Type I or Type II errors. Put differently, in comparison to a white player, a black player is no more or no less likely to receive a foul call for a play which was legal. Similarly a black player is no more or no less likely to get away with a foul, compared to a white player.

In-Group Bias in Referee Decisions

To investigate the existence in-group bias in these decisions, Mocan and Osborn (2021) estimate models of the following type:

$$(1) \text{ Decision}_{prgs} = \alpha + \beta \text{ Black Player}_p + \gamma \text{ Black Referee}_r + \delta \text{ Black Player}_d \times \text{ Black Referee}_r + \Omega \text{ Control Variables}_{pgs} + \varepsilon_{prgs}$$

where Decision_{pr} stands for the decision made on player p by referee r (i.e. calling vs. not calling a foul). The authors also analyze whether these decisions are correct or incorrect. Each player p can have multiple interactions with referee r in a particular game (g) of season (s). The models adjust for season and game attributes as well, although I do not explicitly specify them in equation (1) to keep the notation simple. All offending player and disadvantaged player attributes as well as team and coach attributes are subsumed by the vector *Control Variables*. The coefficient δ signifies the magnitude and the direction of the in-group bias.

The authors estimate different versions of Equation (1), and the results of these analyses reveal no in-group bias in referees' decisions to make a foul call. Put differently, referees are not more or less lenient in making a foul call against a player who is of the same race as the referee.¹⁰ The same inference is obtained when analyzing incorrect calls. In these cases the referees made the wrong decision by calling the event as a foul although there was no foul on the play. Although these were wrongful "convictions" there was no in-group bias in these decisions either.

¹⁰ Price and Wolfers (2010) investigated in-group bias in foul calls in NBA games using data from 1991 to 2003 seasons. Their data did not contain information on which referee made which call. But the authors conducted player-level analyses, where the number foul calls received by players are explained by the percent white referees in that game (which could be 0%, 33%, 67% or 100%). The authors reported in-group bias, where more fouls are called against players when the number of opposite-race referees officiating the game increases. Although the authors cannot disentangle this impact further, they provide suggestive evidence that the bias they document primarily affects white players (Price and Wolfers 2010, p. 1867).

On the other hand, a different picture emerges in the analysis of incorrect non-calls. The referees made 12,900 non-calls. That is, the committing players were “acquitted” 12,900 times. In 1,083 of these were wrongful acquittals in which the players were in fact guilty of a foul (See the bottom right-hand-side of Figure 1). The authors detected in-group bias in these decisions. A player is approximately two percentage points more likely to get away with a foul if the referee is of the same race as the player. This is a sizable impact as fewer than 9 percent of all non-calls are incorrect.

To summarize, race-matching between the player and the referee has no impact on the likelihood of the referee wrongly “convicting” the player (incorrectly calling a foul). *But, if the player is of the same race as the referee, the referee is more likely to incorrectly “acquit” the player (by not making the foul call).* This finding is important as it shows that looking for racial bias in a conventional space (conviction decisions) may not reveal racial bias, because the bias may exist in an unconventional and difficult-to-analyze space (acquittal decisions).

Unbundling the In-group Bias in Wrongful Acquittals

The referees decide on making a foul call or letting the play continue based on what they observe in front of them on the court. That is, players do not choose the referees who will judge their actions. Nor do the referees choose the player on whom they make decisions. Thus, the analysis sample may be divided by the race of the referee to unbundle the in-group bias.

This analysis revealed in-group bias in incorrect no-calls (wrongful acquittals) by black referees. More precisely, black referees are more likely not to call a foul if the

committing player is also black. The impact in the sample of white referees was zero, indicating that the likelihood of a Type II error (wrongful acquittal) does not depend on the race of the committing player if the referee is white. *These results indicate that the in-group bias in wrongful acquittals is driven by black referees.*

Further Unbundling the In-group Bias

Mocan and Osborne (2021) also analyze the extent to which referees' decisions are impacted by their peers. There are always three referees on the court, which means that each referee has two peers in each game. These peers could be both white, both black, or one white and one black. The authors report the results of regression models estimated separately for black and white referees by dividing each group into sub-samples where the referees had two white peers, two black peers, or one white and one black peer. The results show that a black referee is 3 percentage points more likely not to make a foul call on a black player, when the action was a foul, if this black referee has at least one black peer with him on the court. That is, black referees treat black players favorably by not calling fouls on them (or acquitting them wrongfully) if one or both of their peers on the court is also black. On the other hand, if black referees have two white peers, they no longer exhibit in-group favoritism.

Interestingly, peer effects emerge in case of white referees as well. Although there is no overall in-group bias for white referees, the bias pops up when a white referee has two black peers. White referees are 5 percentage points more likely not to call a foul on a white player if both of the other referees are black.

To summarize, black referees let black players get away with a foul (a wrongful acquittal) unless both of their peer referees on the court are white; and white referees do the same for white players if both of the peer referees are black.

These findings underscore a number of important points. First, the lack of racial bias may be misleading because the lack of bias may mask underlying in-group bias. Second, an analysis of overall racial disparity may not reveal the complete picture unless researchers are able to dig deeper into lower layers, such as the investigation of in-group bias and the impact of peers. Third, the bias may not be in conviction-acquittal margin, but it may be in the domain of Type I or Type II errors of decision making, which is more difficult to analyze because the correctness/incorrectness of the decisions are hard to discern.

VIII. Synopsis

While lay observers attribute racial disparities in judges' decisions to discrimination, these differences do not necessarily indicate racial bias. This is because a number of defendant and case characteristics may be correlated with race, and these characteristics may directly or indirectly impact judicial outcomes. Thus, detailed characteristics of the defendants and those of their case files need to be accounted to tease out their impact on judicial decisions. Only then is it possible to identify the true impact of defendant's race on judicial outcomes.

Researchers over the last decade have increasingly recognized these, and other complicating issues (such as potential non-random sorting of defendants across judges, the impact of various other actors of the criminal justice system, and so on) and implemented

appropriate statistical procedures to address these challenges. The aim has been to investigate the existence of any residual disparity in judicial outcomes that cannot be attributed to such confounding factors. The results, by and large, revealed that defendants' race has an impact on judicial outcomes, even after adjusting for many factors that should matter for the adjudication of the case. This is taken as indication of racial bias, and the next step in scientific inquiry seems to be the investigation of the root causes of this bias, such as whether it is driven by racial stereotyping or by racial animus.

Related to racial bias in judicial decision-making, a parallel line of research has demonstrated the existence of in-group bias. Preferential treatment of decision-makers of those who belong to the same group (in-group) has been shown in variety of settings ranging from judicial decisions (Bielen, Marneffe, Mocan 2021, Depew, Eren, and Mocan 2017) to the decisions of driving test evaluators (Bar and Zussman 2020), to teacher perception of student performance (Dee 2005), teaching evaluations of professors by their students (Boring 2017), and evaluations of Olympic athletes in dressage competitions (Sanberg 2018). Research in psychology points to the potential evolutionary sources of in-group bias, and it is important to recognize that in-group preference does not imply out-group hatred.

The recent paper by Mocan and Osborne (2021) investigates the existence of racial Bias in the decisions of NBA referees, while addressing the complicating issues listed earlier. NBA referees are not judges of the legal system. But, similar to judges, they are highly trained professionals who are instructed to use specific guidelines in their decisions. Like judges, NBA referees make conviction and acquittal decisions. These are consequential decisions both for the player and the teams involved. But these decisions

are also consequential for the referees as their performance is evaluated based on the accuracy of their decisions. After controlling for a host of player, and game attributes, Mocan and Osborne (2021) find no racial bias against black or white players in referees' propensity to make a foul call (i.e. to convict). Similarly, there is no in-group bias in these decisions.¹¹

Unlike the analysis of judicial decisions made in a court houses, the primary advantage of Mocan and Osborne (2021) is the ability to identify wrongful convictions as well as wrongful acquittals. In the legal environment this corresponds to the evaluation of lower courts' decisions by the Appellate Courts. In this case, the NBA acts like the appellate court which evaluates the accuracy of referee decisions. Mocan and Osborne (2021) find that the entire activity of racial bias takes place in the domain of wrongful acquittals. More specifically, there is in-group bias in wrongful acquittals, which is driven by black referees. This means that black referees are more likely not to make a foul call if the committing player is also black.

A further layer of nuance emerges when investigating the impact of referees' peers who are the other two referees on the court. The authors find that black referees' in-group favoritism in incorrect non-calls (wrongful acquittals) exist if black referees have one or two black peers on the court, but that in-group bias disappears if black referees have two white peers. The authors also find that although there is no in-group favoritism in non-calls of white referees, this bias emerges if a white referee has two black peers.

¹¹ Price and Wolfers (2010) detected in-group favoritism of NBA referees, linking the foul rate of each player to the proportion of white referees in the corresponding game. It is interesting to note that a re-analysis using the same empirical design but more recent data revealed no in-group bias, which is attributed by the authors to the wide-spread media attention received by the first study and the NBA's and referee's reaction to it that altered their behavior (Pope, Price and Wolfers, 2018).

These findings underscore the central message of this paper: Judges are not bizarre beings. They are humans, who are exposed to, and shaped by the same forces as other humans, ranging from the impact of evolutionary biology to the influence of their peers and the society at large. Therefore, any analysis of judicial decisions should aim to address the impact of these forces in an effort to isolate the “root cause” of these decisions.

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