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ABSTRACT

This paper examines the impact of jury racial composition on trial outcomes using a unique data set of all felony trials in Florida between 2000-2010. We utilize a research design that exploits day-to-day variation in the composition of the jury pool to isolate quasi-random variation in the composition of the seated jury, finding evidence that: (i) juries formed from all-white jury pool convict black defendants significantly (16 percentage points) more often than white defendants and (ii) this gap in conviction rates is entirely eliminated when the jury pool includes at least one black member. IV estimates of the of the racial composition of the seated jury on trial outcomes are about 2.5 times greater than the corresponding OLS estimates, implying that the impact of jury race is much greater than what a simple correlation of the race of the seated jury and conviction rates would suggest. These findings imply that the application of justice is highly uneven and raise obvious concerns about the fairness of trials in jurisdictions with a small proportion of blacks in the jury pool.

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1. Introduction

The Sixth Amendment to the U.S. Constitution establishes the right of a defendant charged with a crime to a trial by an impartial jury.[1] Yet the history of American criminal justice is replete with cases where the abstract promise of jury impartiality has been called into question. Of special concern are settings where a minority member of a population is tried in a location in which few, if any, members of the same minority are likely to serve on the jury.[2] This concern has arisen repeatedly in the context of race, as blacks generally constitute a small fraction of the population, and therefore seated juries, in the majority of U.S. states and counties. Vastly unequal outcomes – the proportion of blacks in the prison population is almost four times that in the general population – along with anecdotal evidence from many cases have led numerous observers to question whether the criminal justice system treats black defendants (and victims) fairly.

Despite the fundamental importance of the equal and impartial application of the law for the American criminal justice system, the empirical literature on the effect of jury racial composition on trial outcomes is sparse and flawed. Studies based on experimental evidence from "mock" trials are limited by numerous simplifications made for experimental expediency and, more fundamentally, by the substantially lower stakes compared to real criminal trials.[3] And, the few studies that examine the correlation between the composition of the seated jury and trial outcomes are problematic because the seated jury results from a non-random selection process.[4] In particular, in the vast majority of criminal trials in the United States, prosecution and defense attorneys are able to exclude a sizeable number of potential jurors in the jury pool from the seated jury without explanation through the use of *peremptory challenges*. As a result, even if the initial jury pool is randomly drawn, the composition of the seated jury may be correlated with the nature of the charges and evidence in the case as well as the attributes of the defendant.

Given the limitations of the existing literature, the main goal of this paper is to provide the first empirical evidence of the effects of jury composition on trial outcomes based on quasi-random variation in jury composition *and* data from real criminal trials. We do so by combining a unique dataset that provides information on both the seated jury and jury pool for each trial with a novel research design that

[1] The 6th Amendment states that "In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed;"

[2] Sommers and Ellsworth (2003) highlight some of the higher profile cases where there have been questions about the role of race in jury decisions.

[3] For instance, mock jurors typically hear a substantially condensed version of a case, i.e. a one-page write-up, do not see a "defendant", and decide the verdict individually rather than coming to a unanimous decision as a group. In addition, they are rarely representative of the population and are actually often white college students.

[4] See, for instance, Bowers et al. (2001) study of capital cases and Daudistel et al (1999) study of non-felony cases.

seeks to isolate a random source of variation in jury composition. Our data set consists of all felony trials for which jury selection began in Sarasota and Lake Counties, Florida during 5.5- and 10-year periods, respectively, in the 2000s. The data are unusually rich in providing information on the age, race, and gender not only for each of the 6-7 members of the seated jury but also for the approximately 27 members of the jury pool for the trial from which the seated jury is selected. The data set also contains detailed information about the race and gender of the defendant, the criminal charge(s), and the final jury verdict.

Our research design exploits the variation in the composition of the jury pool across trials, which is driven primarily by which eligible jurors in the county are randomly called for jury duty on a given day.[5] In essence, we examine how conviction rates for white and black defendants vary with the composition of the jury pool rather than the seated jury. The day-to-day variation in the composition of the jury pool does in fact appear to be random – the composition of the pool is uncorrelated with the characteristics of the defendant and the criminal charges. And, because the eligible jury population in both Sarasota and Lake Counties is less than 5 percent black, much of the variation in the sample is between pools in which there are no black potential jurors (36 percent) and those with at least one black member (64 percent).

The evidence regarding the impact of the jury pool on conviction rates is straightforward and striking: the presence of even one or two blacks in the jury pool results in significantly *higher* conviction rates for white defendants and *lower* conviction rates for black defendants. Specifically, in cases with no blacks in the jury pool, black defendants are convicted at an 81 percent rate and white defendants at a 66 percent rate. When the jury pool includes at least one black potential juror, conviction rates are almost identical: 71 percent for black defendants and 73 percent for white defendants. The estimated impact of the racial composition of the jury pool on trial outcomes is statistically significant and leads to three main conclusions: (i) there is a significant gap in conviction rates for black versus white defendants when there are no blacks in the jury pool, (ii) the gap in conviction rates for black versus white defendants is eliminated when there is at least one black member of the jury pool, and (iii) conviction rates for white defendants are significantly higher when there is at least one black member of the jury pool (versus all-white jury pools). The estimates are robust to a number of alternative specifications, e.g., the inclusion of other case and defendant characteristics interacted with jury race, and the same pattern holds in both Lake and Sarasota counties independently.

[5]Though we are not aware of other studies that use random variation in jury composition as a source of identification, there are a handful of studies utilizing random variation in other aspects of the criminal justice system. Abrams et al. (2009), for instance, take advantage of the random assignment of cases to judges to study whether there are disparities across judges in the racial gap in sentencing. Kling (2006) uses random judge assignment as a source of exogenous variation in sentence length. Abrams and Yoon (2007) use the random assignment of felony cases to public defenders in Las Vegas to study the effect of attorney ability on case outcomes.

Having established that the racial composition of the jury pool has a substantial impact on conviction rates, we consider a number of possible channels through which random variation in the composition of the jury pool might affect trial outcomes. Most obviously and directly, having at least one black member in the jury pool makes it feasible to have a black member on the seated jury. Black representation on the seated jury might affect trial outcomes not only through the jury deliberation and decision process but also by affecting how the case is presented and argued by the prosecution and defense attorneys.

Adding black potential jurors to the pool can also affect trial outcomes even when these jurors are not ultimately seated on the jury. This *indirect* effect comes about through the jury selection process if attorneys on each side use their peremptory challenges to strike the potential jurors most likely to be hostile to their case. We would expect the defense attorney, for example, to systematically strike those jurors with the highest *ex ante* probabilities of conviction (i.e., those in the upper tail of the distribution) based on their observable attributes and answers to pre-trial questioning. In this way, whenever attorneys use peremptory challenges to strike black members of the pool (presumably when they are in the tail of the distribution), they forgo the possibility of excluding another potential juror with a similar *ex ante* probability of convicting. This pulls the likelihood of conviction for the seated jurors towards that excluded person's position even though he or she does not wind up serving on the jury.

In addition to illustrating how a member of the jury pool could affect trial outcomes even without being seated, this view of the selection process also provides an explanation for another striking fact from the data: that black and white potential jurors in the pool are about equally likely to be seated. While attorneys may have additional motivations for seating black jurors in proportion to their representation in the pool – in particular, it is illegal to consider race when using peremptory challenges –the distributions of *ex ante* likelihoods of conviction for white and black members of the jury pool may naturally overlap significantly when there is substantial within-race heterogeneity. Given this heterogeneity, the attorneys will effectively seat a significant number of black potential jurors whose *ex ante* likelihoods of conviction are not all that different than those of the seated white jurors.

In the penultimate section of the paper, we attempt to distinguish which of these mechanisms are most consistent with the data on trial outcomes and jury selection. We present OLS and IV estimates of the effect of the race of the seated jury on trial outcomes (using the composition of the jury pool as an instrument). We focus on two broad results. First, the estimated OLS effect of adding a *black juror to the seated jury* on the black-white conviction gap is about the same size as the reduced form estimate of the impact of adding a *black potential juror to the pool*. Second, the magnitude of the estimated effect in the IV specification is about 2.5 times greater than that of the OLS estimate. There are two possible explanations for these results: (i) that the addition of black potential jurors to the pool has a significant

effect on trial outcomes *regardless of whether or not these jurors are actually seated* (the indirect mechanism described above) and/or (ii) that jury selection induces substantial correlation between the race of the seated jury and unobserved aspects of the case or defendant leading to significant bias in the OLS estimate of the effect of jury race on the black-white conviction gap. While we argue below that the weight of the evidence favors the former explanation, importantly, either explanation implies that the effect of jury race on conviction rates is much greater than what the naive OLS estimates of the effect of the seated jury would suggest.

We conclude the paper with a discussion of the implications of our findings regarding the fair and equal application of the law. Our main findings imply that the application of justice is highly uneven, as even small changes in the composition of the jury pool have a large impact on average conviction rates for black versus white defendants. They also show that defendants of each race do relatively better when the jury pool contains more members of their own race, raising obvious concerns about whether black defendants receive a fair trial in jurisdictions with a small proportion of blacks in the jury pool. The implications of our analysis for the fairness of trial outcomes are fundamentally limited by the fact that the strength of the evidence in cases brought against white and black defendants is not observed directly in the data. As a result, it is impossible to draw firm conclusions about what relative conviction rates should be for black and white defendants. If in fact the strength of the evidence in cases involving black and white defendants is comparable, our results would imply that juries resulting from all-white jury pools require weaker standards of evidence to convict black versus white defendants, while juries resulting from jury pools with at least some black members apply comparable standards. We discuss how future research could address the vital question of fairness in the conclusion of the paper.

The remainder of the paper proceeds as follows. Section 2 provides background information on jury selection in the United States, jury trials in Florida, and relevant literature, while Section 3 describes the data. Section 4 presents our main analysis of the impact of jury racial composition on conviction rates for black and white defendants as well as a number of alternative specifications that establish the robustness of our main findings. Section 5 interprets our findings in the context of a number of additional empirical regularities and potential channels through which variation in the jury pool might affect trial outcomes. Section 6 concludes by discussing the implications of our findings for the fair and equal application of the law.

2. The Jury Trial

Overview of the Jury Selection Process

The jury trial is a prominent part of the U.S. justice system. Hannaford-Agor et al. (2007) estimate that there are 154,000 jury trials per year in the U.S., 66 percent of which are criminal trials.

They also estimate that 32 million people are summoned each year for jury service and that 1.5 million jurors are impaneled each year. While many details are determined at the state level, the core elements of jury selection are fairly standard across jurisdictions. Each jurisdiction has a master jury list, a list of individuals that are considered to be potential jurors.[6] Eligibility criteria for jury service are also fairly consistent across states: an individual must be a U.S. citizen, a resident of the geographic jurisdiction served by the court, able to speak/understand English, and not under a legal disability (felony conviction or incompetence) (Rottman and Strickland, 2006). Individuals from the master jury list are randomly selected to receive a summons for jury service, which requests that the individual appear at the courthouse on a given date for jury selection (voir dire).

To give a brief overview of the process, let us suppose that 100 individuals receive a summons to appear (and that they actually do appear) on a given day. For simplicity, assume that the jury for just one trial is to be chosen. Of the 100 potential jurors, 30 are called into the courtroom to be in the venire, i.e. the actual pool of jurors from which the jury is chosen. The prosecutor and defense attorneys (or the judge, depending on the state) then ask the potential jurors a series of questions, which are designed to determine whether the individual is fit to serve as an impartial member of the jury. Some individuals are simply excused from service, perhaps because of a medical condition. Other individuals are removed for cause by the judge because they cannot be impartial or follow the law; for instance, they may have a personal relationship with the defendant or state that they are unwilling to impose a particular punishment, like the death penalty. Both prosecutor and defense attorneys can request a removal for cause, and there is generally no limit to the amount of such requests.

Finally, both the prosecutor and defense attorneys have the option to use peremptory challenges to strike potential jurors from the jury. Such challenges are differentiated from removals for cause in that the attorneys do not have to state the reason for the strike and there are a limited number of peremptory challenges available to both the prosecution and defense.[7] Though the attorneys do not have to provide a reason for dismissing a juror, a peremptory challenge cannot be used to strike a juror solely on the basis of race or gender.[8] Numerous studies, however, indicate that the use of the peremptory challenge is not

[6] Nineteen states use a combined list of registered voters and licensed drivers (Hannaford-Agor, Mize, and Waters, 2007).

[7] The number of challenges allocated to both sides depends on the state and type of trial (criminal or civil, felony or misdemeanor, capital or non-capital); in some states, the prosecution and defense are allotted different numbers of strikes.

[8] The Supreme Court first confronted the issue of race-based peremptory challenges in 1965 in *Swain v. Alabama*, in which they ruled that the "State's purposeful or deliberate denial to Negroes on account of race of participation as jurors in the administration of justice violates the Equal Protection Clause". However, the burden of proof on the defendant of such bias was very high, as they had to show that there was a systematic striking of black jurors in the

race neutral; rather, they often find that prosecutors are more likely to strike black venire members and defense attorneys are more likely to strike white venire members (Diamond et. al., 2009; Baldus et. al, 2001; McGonigle, Becka, LaFleur, and Wyatt, 2005; Rose, 1999; Sommers and Norton, 2007; Turner, Lovell, Young and Denny, 1986).[9] Though race appears to play a role in both the prosecutor's and defense's use of peremptory challenges, studies have also shown that these opposing challenges cancel each other out, in the sense that there is no overall effect on the racial composition of the jury (Diamond et. al., 2009 and Rose, 1999). Importantly, however, even without affecting the number of seated jurors of each race, the use of peremptory challenges may affect trial outcomes by altering the attributes (potentially unobserved in the data) of the seated jurors of each race.

Thus, jury selection begins with a pool of 30 individuals; potential jurors are then interviewed in sequence and potentially excused, removed for cause, or struck via the peremptory challenge. Those who survive voir dire make up the jury, the size of which depends on the jurisdiction and type of trial. Historically, juries were composed of 12 individuals; 12-member juries are still used in many states and especially in serious criminal trials. In part to reduce court costs, however, many states now use smaller juries (6-8 jurors) for civil trials and less serious criminal trials (Hannaford-Agor, 2009; Waters, 2004). In addition, one or two alternates are often chosen at this time (through the same set of questioning and dismissing procedures).

Jury Trials in Sarasota County and Lake County, Florida

In Florida, circuit courts have jurisdiction over felonies, family law matters, civil cases of over $15,000, probate/guardianship/mental health, and juvenile dependency and delinquency. County courts have jurisdiction over misdemeanors, small claims (up to $5,000), civil cases of $15,000 and less, and traffic offenses. We will be studying felony jury trials in Sarasota County and Lake County and hence are using data from two circuit courts. Chapter 913 of The 2009 Florida Statutes provides details about the jury trial in Florida. First, all non-capital cases have 6-person juries with 0-2 alternates; capital cases have 12-person juries. Second, the state and the defendant are both allocated equal numbers of peremptory

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whole county, and not just in their own case. *Batson v. Kentucky* (1986) significantly lessened the burden of proof on the defendant, as they now could rely on the record only in their own case.

[9] Baldus et. al. (2001) provide anecdotal evidence that race plays a role in jury selection. They describe a 1986 attorney training video created by Philadelphia prosecutor Jack McMahon, which says that the 'best' jurors to obtain a conviction are conservative, middle class individuals of comparable intellectual ability. He says the 'worst' jurors are blacks from low-income areas who resent law enforcement and have a general tendency to resist authority. He also says that prosecutors should particularly avoid black female jurors, but that older black men were less problematic. Additional anecdotal evidence is provided by Stevenson and Friedman (1994), who describe the trial of Albert Jefferson in Alabama. The prosecutor exercised his discretionary challenges against 24 of the 26 African Americans among the prospective jurors, resulting in an all white jury. Long after the trial, the defense discovered the prosecution's juror ranking system: strong, medium, weak, and black (the least desirable category).

challenges, which depend on the type of offense. If the offense is punishable by death or life imprisonment, then there are ten challenges; if the offense is punishable by imprisonment of more than 12 months, then there are six challenges; for all other offenses, there are three challenges.

We obtained the following details specific to jury trials in Sarasota County Circuit Court and Lake County Circuit Court from the Courts' websites and communications with administrators of the courts.[10] Both Sarasota and Lake Counties use one source list, driver's licenses from the Department of Highway Safety and Motor Vehicles, to compile the master jury list. Both counties use a jury management software program to randomly choose individuals from this master list to receive a summons requesting that they appear at the courthouse on a particular date.[11] Some individuals who receive a summons are eligible for an automatic exemption and need not appear in court.[12] The eligibility criteria (also listed on the websites) are in line with those described in the general overview in the previous section.[13]

Individuals who do not excuse themselves for the reasons stated above and who are eligible to serve check-in on the date summoned; upon check-in, they are entered into the jury management software program.[14] From the sample of checked-in individuals, this software randomly chooses individuals to participate in a particular panel. It is important to note that the jury management software program only utilizes data about jurors and does not have information about the defendants or case characteristics. Individuals whose names are called out enter the courtroom to participate in voir dire, during which questioning is done by both the attorneys (defense and prosecution) and the judge.[15]

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[10] http://www.sarasotaclerk.com/default.asp?Page=68 ; http://lakecountyclerk.org/courts/jury_management.aspx

[11] Each juror in Lake County is assigned a group number on their summons. Individuals who receive a summons are instructed to call a recording prior to reporting. If their group number is called in, according to this recording, then the individual would report. The number of groups that are called is primarily determined by the number of trials in a given week.

[12] Individuals can be automatically excused if: (i) they are an expectant mother, (ii) they are a parent who is not employed full time and has custody of a child under 6, (iii) they are a full time law enforcement officer, (iv) they served as a juror in Sarasota county in the last 365 days, (v) they are responsible for the care of another who is incapable of caring for himself, or (vi) they are 70 or older and wish not to report (at this time or permanently).

[13] Perhaps of particular relevance for these jurisdictions is the fact that individuals are only eligible for jury duty if they are a legal resident of the State of Florida and Sarasota or Lake County and they possess a valid Florida driver's license or identification card. Thus, individuals who are permanent residents of other states, such as Illinois or New York, but spend the winter months in Florida would not be eligible for jury duty. Thus, while there is potentially seasonal variation in the composition of the populations in Sarasota and Lake Counties, this seasonal variation should not affect the composition of the jury pool or jury.

[14] In Lake County, for instance, jurors check in using a form attached to their jury summons, which has a bar code on it. Scanning the bar code give the potential juror "attendance for reporting" and places them into the pool.

[15] Details about compensation are also available on the website. Jurors whose employers continue to pay them during jury service do not receive any additional compensation from the courts for the first three days of service.

Literature Review

The majority of the literature that has examined the impact of jury composition on trial outcomes has used mock jury trials. Participants or "mock jurors" hear a condensed version of a trial, typically a one-page write-up of a court case and are asked individually whether they want to convict or acquit the defendant. These studies test for discrimination by keeping the summary of the case the same, but varying the race of the defendant.

Sommers (2007) provides a recent review of this literature and notes that the findings from these studies are mixed. Some studies (McGuire and Bermant, 1977 and Skolnick and Shaw, 1997) find that the defendant's race does not have a consistent effect on white jurors; others (McGowen and King, 1982, and Poulson, 1990) find that white jurors treat white versus non-white defendants more severely; and still others show the exact opposite (DeSantis and Kayson, 1997; Hymes et. al., 1993; Klein and Creech, 1982). Sommers (2007) highlights the fact that there is very little research that looks at whether black and white jurors are differentially affected by a defendant's race. One exception, Skolnick and Shaw (1997), finds that white mock jurors rendered comparable decisions for black and white defendants while black mock jurors are more likely to convict white defendants. In contrast, Bernard (1979) found that white jurors showed less compassion, particularly towards black defendants, and that black jurors as a whole were more likely to acquit, regardless of race.

Several studies by Sommers (2002, 2006) examine the difference in behavior of diverse versus homogenous juries. In these studies, Sommers created mock juries using jury eligible citizens for a rape trial with a black defendant and varied the racial composition of the jury. He found that the racial composition of the jury influenced both the content and scope of the discussions between the jurors: compared to all white juries, racially mixed juries tended to deliberate longer, discuss more case facts, and raise more questions about what was missing from the trials. Diverse juries were also more likely to discuss race issues, such as profiling, during deliberations, with white jurors often raising these issues. Finally, he found that white jurors on racially mixed juries were less likely to vote to convict than white jurors on all white juries, even when the vote was taken before the deliberations occurred. This implies that white jurors can behave quite differently when they are seated with other whites versus when they are seated with black jurors. Consistent with this, Hans and Vidmar (1982) suggest that a diverse jury composition motivates whites to avoid the appearance of bias.

The main drawback to these mock jury trials is their external validity. Of particular concern is the fact that most of these mock jurors are white college students with trial conditions and stakes that are

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Jurors who are unemployed (or whose employers do not pay them while they are serving) receive $15.00 per day for the first three days. After three days of service, all jurors are paid $30.00 per day.

much lower than those in a real criminal trial. Moreover, in the vast majority of studies, individuals reach their decision in isolation, quite unlike actual jury deliberations where jurors must deliberate collectively and reach a unanimous verdict. Furthermore, the role of race may be much less central in mock trials, where the defendant's race is simply noted when compared to an actual trial in which the defendant is seated in the same room as the jury.

A small handful of studies have used data from actual trials to examine the correlation of jury composition and trial outcomes. Bowers et al. (2001) examined 340 capital trials and found that the greater the proportion of whites to blacks on the jury, the more likely a black defendant was to be sentenced to death, especially when the victim was white. Daudistel et al. (1999) find similar results for 317 non-felony juries in Texas comprised of whites and Latinos.[16] The main limitation of all of the previous studies that use data from actual trials is that the conclusions are based entirely on the correlation between jury composition and trial outcomes and, therefore, subject to serious concerns related to the non-random jury selection process.

3. Data

Description of Jury Data from Sarasota and Lake Counties

Our analysis is conducted using felony jury trial data for Lake County and Sarasota County, Florida. As each county circuit court maintains their own records of jury trials, these data were obtained through separate requests to each county. To the best of our knowledge, Sarasota County and Lake County are the only two circuit courts in Florida (of reasonable size) that maintain information on the race of jurors and members of the jury pool. The inclusion of the race of each jury member, let alone each member of the jury pool, makes these data particularly unique.[17] Since a standardized record system is not used throughout Florida, the type of information and format of the data available vary somewhat across counties. Thus, the majority of our analysis is conducted with a single, combined data set of Lake and

[16] Also of note, Lee (2009) finds evidence that states that switched from key-man jury selection procedures to more random selection procedures saw a resulting drop in the share of new admissions to prison accounted for by non-whites and infers that having more blacks on the jury resulted in blacks being less likely to be convicted. In addition to the possibility that other unrelated factors (changes in the criminal behavior of whites versus non-whites over this period) had an effect on new prison admissions, it is impossible to tell whether Lee's result is obtained simply because black and white jurors use different standards for all defendants or discriminate on the basis of defendant race.

[17] Generally, few courts maintain records that identify the race of each jury member and even fewer identify the race of the jury pool member; in fact, many do not even keep records of who was on the jury pool. To obtain the data used in this paper, we sent data request letters to every felony court in fifteen states: Maryland, Pennsylvania, Arizona, California, Connecticut, Florida, Georgia, Illinois, Massachusetts, New Jersey, New York, North Carolina, Texas, Virginia, and Washington.

Sarasota County trials, using those variables that can be commonly identified in both counties. Following is a brief description of the data obtained for each county as well as the combined data set.

The office of the Clerk of the Sarasota County Circuit Court provided us with information on all felony trials for which jury selection began between January 1, 2004 and June 1, 2009. Note that because of the (oftentimes long) lag between the date at which an offense is filed with the courts and the date at which a verdict is rendered, our data set contains trials for offenses dating as far back as 1999. For each trial, we have data for both the defendant and the jury. The defendant data includes the name, race, and gender of the defendant as well as information about the charged offenses, including a detailed crime code, the date that the offense was filed, the date that the judgment was handed down, and the verdict for each offense. For our main analysis, we restrict our sample to trials in which at least one of the charged offenses resulted in a verdict of guilty or not guilty *by the jury*.[18] The jury data includes the name, date of birth, gender, and race of each individual in the jury pool as well as whether or not they were seated. However, we cannot distinguish between individuals who are seated and those who became alternates; all of these individuals appear to be 'seated'.

Data were also provided to us by the Lake County Clerk of Courts for all felony jury trials from March 1, 2000 to April 2, 2010. As in Sarasota County, we know each potential juror's name, race, gender, date of birth, and whether they were seated or assigned as alternates.[19] In terms of the defendant information, the Lake County Clerk of Courts only provided the case number and defendant name. We used this information to manually collect the following information from the Lake County Clerk of Courts Online Court Records website: city of residence, sex, race, attorney, judge, the number of charges, the type of charge, and the verdict for each charge.[20] As in Sarasota, we restrict our sample to trials in which at least one of the charged offenses resulted in a verdict of guilty or not guilty *by the jury*.[21]

Since all felony trials in Florida other than capital trials have six-member juries, we exclude capital trials from our analysis. Since each jury should have six members plus zero to two alternates, we drop those cases with less than six jurors/alternates identified in the data and those with more than 8. We also drop those cases with multiple defendants and those in which the defendant names do not match the

[18] Charges for which the verdict was neither guilty nor not guilty had the following possible outcomes: dropped, Noelle prosequi, filed, dismissed due to speedy trial, dismissed with no reason given, consolidated, adjudication withheld by judge and unable to stand trial. We will test the sensitivity of our results to the exclusion of these cases.

[19] In Lake County, we can distinguish between alternates and those that are seated. However, we group all of these individuals together so that the Lake County measures conform to those for Sarasota County.

[20] The data was collected from the following website: http://www.lakecountyclerk.org/record_searches/court_records_agreement.aspx?to=%2Frecord%5Fsearches%2Fonline%5Fcourt%5Frecords%2Fonline%5Fcourt%5Frecords%2Easp?target%3D%5Fblank.

[21] Other possible verdicts include: pled, nolle prosequi, no information, dismissed by judge, and mistrial. We will test the sensitivity of our results to redefining pleas as decisions of guilty by the jury.

online record (i.e. in Lake County). We are left with a dataset of 785 felony jury trials, 401 of which are from Sarasota County and 384 of which are from Lake County. Our analysis focuses on the 712 trials in which the main dependent variables are defined and the defendant is identified as being either black (n = 333) or white (n = 379).

Summary Statistics

Table 1 presents descriptive statistics for both the defendant and jury variables for all 785 felony trials overall and separately for the black and white defendants used in our analysis. We also break the overall sample down into Lake versus Sarasota County cases. Overall, 44 percent of defendants are black (50 percent in Lake County and 38 percent in Sarasota County). The average number of charges is 2.99, with a slightly higher average in Lake than Sarasota County (3.5 versus 2.6). We identify whether each defendant is charged with an offense in the following categories, regardless of the verdict associated with the charge: murder (non-capital), robbery, other violent offenses, property offenses, drug offenses, sex offenses, weapons offenses, and other offenses. Overall, the most common crime categories are other offenses (33 percent), other violent offenses (31 percent), and drug offenses (25 percent). There are some differences in the distribution of crime types across defendant race: 38 percent of black defendants have at least one drug charge compared with 14 percent of white defendants. In contrast, 8.1 percent of black defendants are charged with a sex offense compared to 17.9 percent of white defendants.

We consider two possible outcome measures or verdicts: whether the defendant was convicted of at least one offense and the percent of the first five offenses for which the defendant was convicted. 74.5 percent of black defendants and 70.2 percent of white defendants were convicted of at least one offense.[22] On average, seated juries have seven members (including alternates) drawn from jury pools with 27 individuals. The average composition of the seated jury is 52 percent female while 23 percent are age 40 or younger and 49 percent are between the ages of 40 and 60. These statistics are fairly constant across defendant race.

Approximately 64 percent of Lake and Sarasota cases had at least one black potential juror in the pool, while just 28 percent of trials had at least one black member of the seated jury. These numbers are driven primarily by the small proportion of blacks in the jury pool – 3.9 percent.[23] In fact, blacks are

[22] One feature of the data to note is that there are generally lower conviction rates by juries in Lake County than in Sarasota County: 65 percent of Lake County charges result in a guilty jury verdict compared to 80 percent in Sarasota. Given this and the differences in the racial composition of Sarasota and Lake Counties described below, we also present our results separately for each county.

[23] Fukurai, Butler, and Booth (1991) and Sommers (2008) suggest numerous reasons that the jury pool is disproportionately less black than the population, including: (i) many blacks are disqualified because of criminal records, (ii) master lists are based on driver licenses and voter registration lists, which are disproportionately

slightly more represented on seated juries (4.6 percent) than in the jury pool, implying that potential black jurors are slightly more likely to be seated than white jurors. In general, there is a higher proportion of blacks in both the jury pool and seated jury in Lake versus Sarasota County, which is consistent with cross-county differences in demographics.[24]

Table 2 examines whether variation in the demographic composition of the jury pool across trials is uncorrelated with defendant and case characteristics, consistent with the notion that the jury pool varies quasi-randomly from trial to trial. Specifically, we regress a particular demographic characteristic, such as the proportion of black jurors in the pool, on several observable defendant and case characteristics.[25] If the jury pool were truly randomly assigned to cases, the regression coefficients should be close to zero and statistically insignificant. This is essentially what we find, as just five of the 84 coefficients presented in this table are statistically significant at the 5 percent level and the magnitudes of all coefficients are quite small. While these regressions cannot rule out the possibility that the composition of the jury pool is related to attributes of the defendant or case that are unobserved to us, they suggest that this should not be a major concern. These results are also consistent with the jury management software: (i) randomly choosing potential jurors from the master list to receive summons for jury duty and (ii) randomly choosing from the group of summoned individual those who will participate in voir dire for a particular trial.

4. The Effect of the Racial Composition of the Jury Pool on Conviction Rates

In this section, we examine the impact of the racial composition of the *jury pool* on conviction rates for white and black defendants. Table 3 presents cross-tabulations that show how conviction rates vary with whether there are any blacks in the jury pool. When there are no potential black jurors in the pool, black defendants are significantly more likely than whites to be convicted of at least one crime (81 percent for blacks versus 66 percent for whites). However, as the number of blacks in the pool increases, this differential goes away: in fact, with at least one black member of the jury pool, conviction rates are almost identical (71 percent for blacks and 73 percent for whites).

The first column of Table 4 expresses these results in regression form: the dependant variable is an indicator for whether the defendant was convicted of at least one charged crime and the regressors include indicators for (i) whether the defendant is black (*def_black*), (ii) whether there are any black

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nonblack, (iii) blacks are less likely respond to a summons because they mistrust the judicial system, and (iv) source lists are often not updated as often as they should be, which could result in mobile citizens (renters) being difficult to reach.

[24] According to the U.S. Census Bureau, 9.4 percent of Lake County residents were black in 2009 compared to 4.8 percent in Sarasota County.

[25] Note that 14 cases are dropped from these regressions due to incomplete charge information.

jurors in the pool (*any_black_pool*), and (iii) the interaction of these two variables (*def_black*any_black_pool*). The remaining columns of the table show how these key coefficients change as additional control variables are included in the specification. In particular, Column (2) reports results for a specification that adds controls for the gender and age composition of the pool to account for potential correlations between jury race, gender, and age. Column (3) adds county dummies while Column (4) adds a set of dummy variables for the year of filing to address the possibility that there have been trends in crime patterns or convictions rates over time. In all of the specifications reported in Table 4, the additional control variables described above are fully interacted with the defendant's race. This allows for the possibility that these control variables have a differential effect for black and white defendants, just as we have allowed for the racial composition of the jury pool.[26]

The point estimates for the three key coefficients in these four specifications are remarkably robust and statistically significant in all of the specifications that include controls. For expositional convenience, we use the specification reported in Column (4) as our *benchmark* specification for the remainder of the paper and discuss the results referring to this specification. The coefficient estimates in this benchmark specification support three main conclusions. First, there is a large (16 percentage point) gap in conviction rates for black versus white defendants when there are no blacks in the jury pool. Second, the gap in conviction rates for black versus white defendants is significantly lower when there is at least one black member of the jury pool. In fact, the point estimate implies that the *entire* gap is eliminated in this case. And, third, conviction rates for white defendants are sharply (10.5 percentage points) higher when there is at least one black member of the jury pool (versus all-white jury pools).[27] Table 5 repeats the same structure as Table 4 using the fraction of the first five offenses on which the defendant was found guilty as the dependant variable. The results are similar in both magnitude and statistical significance.

Before considering the robustness of these findings to additional alternative explanations, it is worth emphasizing that the coefficient estimates reported in Tables 4 and 5 are not only significant in the statistical sense but are also large in magnitude. Given that very few jury pools have more than two black members, the results presented above reveal large changes in conviction rates with the addition of just one or two black members to an otherwise homogeneously white jury pool. Moreover, it is important to bear

[26] In addition, each control variable is demeaned (prior to being interacted), which ensures that the main coefficients in Table 4 are reported at the sample mean in each specification and therefore comparable; i.e. there is no need to look at the coefficients on the interaction variables included in the vector of controls.

[27] The findings from this benchmark specification are also qualitatively and quantitatively comparable when estimated via a probit model rather than a linear probability model. Specifically, the following marginal effects are found: def_black (0.18), any_black_pool (0.10), and def_black*any_black_pool (-0.19). Each of these estimates is significant at the 5 or 1 percent level.

in mind that the magnitude of these effects reflects the average impact potential black jurors have on conviction rates *regardless of whether they are actually seated on the trial jury* – in fact, each black member of the jury pool has about a one-third chance of being seated. In the next section of the paper, we discuss ways in which members of the jury pool might affect trial outcomes both when they are seated and when they are dismissed through peremptory challenges.

Table 6 reports estimates for a number of alternative specifications using whether the defendant was convicted of at least one crime as the dependant variable. Column (1) repeats the benchmark specification (Column 4 of Table 4). Column (2) of Table 6 reports estimates for specifications that include controls for a set of additional defendant and case characteristics (gender, offense category, and number of offenses), fully interacted with the jury pool composition.[28] Including controls for defendant and case characteristics addresses the possibility that the effect of jury race on conviction rates is not driven directly by the race of the defendant but by other differences across cases (e.g., the type of offense the defendant is charged with) that are correlated with defendant race. In effect, the specification shown in Column (2) compares outcomes by defendant and jury race *within the same crime category*. Despite adding twenty additional control variables to a regression with 712 observations, the point estimates for all three key coefficients remain similar to the benchmark specification and statistically significant at standard confidence levels. Column (3) adds a full set of judge fixed effects fully interacted with defendant race (50 variables in all) to the benchmark specification, again leading to essentially the same conclusions both qualitatively and quantitatively.

Columns (4)-(6) consider the robustness of the results to alternative ways of categorizing trial outcomes that are not simple verdicts of "guilty" or "not guilty" by the jury. For instance, Column (4) redefines as guilty 133 cases in Lake County that are pled by the defendant at some point after a jury pool is chosen (but before the case actually goes to the jury). It is theoretically ambiguous whether such cases should be included in the analysis (categorized as guilty verdicts). On the one hand, it makes sense to include them if these plea bargains are reached because the composition of the jury implies that a guilty verdict is very likely. On the other hand, if these plea bargains are reached for reasons unrelated to the jury composition (as they would be if reached prior to jury selection), including them biases the coefficients towards zero as the outcome is, by construction, the same for all of these trials regardless of the jury composition.[29] Column (5) recodes those 25 Sarasota cases that did not have guilty or not guilty jury verdicts associated with it (see footnote 18) as not guilty while Column (6) repeats the same exercise,

[28] As above, when interactions of the controls and jury composition are included, the point estimates are reported at the mean to ensure comparability across specifications.

[29] It appears that many of the plea bargains included here are reached the day the case is scheduled to be heard in court but before *voir dire* begins. In particular, in about one-third of cases, we observe data characterizing the composition of the jury pool but not a seated jury, suggesting that *voir dire* did not actually occur in these cases.

coding these cases as guilty. In all cases, the results are very similar to the benchmark results reported in Column (1) of Table 6.

Table 7 explores the heterogeneity of the results across a number of different subsamples. Given the relatively small number of observations in each of these specifications, we report results for the baseline specification (i.e., without any additional control variables). Column (1) repeats the baseline specification (Column 1 of Table 4), while columns (2) and (3) report analogous specifications, estimated separately for Lake and Sarasota Counties, respectively. These specifications reveal a remarkably similar qualitative pattern of results in each county; the magnitude of the key coefficients is generally greater in Lake County.

The final three columns of Table 7 examine heterogeneity across crime categories, reporting separate estimates for defendants charged with drug, violent, and property crimes, respectively.[30] While the standard errors are larger than for the full sample due to the small number of observations in each crime category, many of the key coefficients are statistically significant and especially large for drug and violent crimes. The point estimates imply that all-white jury pools convict black defendants of drug crimes at an almost 25 percentage point higher rate than white defendants *and* that this gap is not only eliminated but even reversed when at least one black potential juror is added to the pool. In this case, the gap closes both because conviction rates for white defendants rise while those for blacks fall significantly. A similar pattern emerges for violent crimes, although the only coefficient that is statistically significant in this case is the interaction term, which implies that adding at least one black potential juror to the pool decreases conviction rates for black defendants relative to whites. The impact of jury race is statistically insignificant for property crimes; if anything, the point estimates imply that jury pools with at least one black member are more favorable to white versus black defendants for these crimes.

5. Understanding the Impact of Jury Race on Trial Outcomes

The evidence presented in Tables 2-7 leads to a number of robust conclusions about the impact of the racial composition of the jury pool on trial outcomes. Having established these main results, we now consider possible mechanisms through which the jury pool might affect conviction rates and attempt to distinguish which mechanisms are most consistent with the pattern of trial outcomes and jury selection observed in the data.

[30] Note that it is possible for defendants to be charged with multiple crimes. The dependant variable here is whether the defendant was found guilty of the crime in the corresponding category. These dependant variables are only defined, however, for those cases in which a jury verdict was reached in the given category. Given the small sample sizes, the large set of benchmark controls are excluded from these specifications; when they are included, the qualitative pattern of results remains but there is a decrease in precision.

Possible Mechanisms

The most *direct* way that the racial composition of the jury pool might affect trial outcomes is through its impact on the racial composition of the seated jury. It is, of course, impossible to have any black members on the seated jury if there are no black members of the jury pool. Black members of the seated jury might affect trial outcomes in a number of ways, including through: (i) the jury deliberation and decision process and (ii) the way that the attorneys present the evidence in the case. In the deliberation and decision process, a black member of the seated jury could have an effect on the outcome either if she was generally more (or less) likely to vote to convict than the white juror that she replaced or if her presence changed the nature of the deliberations, thereby affecting the votes of the other white members of the jury. The latter could arise if the black member of the jury was able to contribute a unique perspective to the jury deliberations or if white jurors were more concerned about appearing racially biased in the presence of a black colleague.

The addition of one or two blacks to the jury pool could also have an *indirect* effect on trial outcomes even when no blacks are seated on the jury. If the attorneys can use observable attributes of potential jurors (e.g., age, appearance, race) along with their answers to pre-trial questioning to form *ex ante* expectations of their likelihoods of conviction, we would generally expect the attorneys on each side to use their peremptory challenges to strike those potential jurors most likely to be hostile to their side. As a result, whenever an attorney uses a peremptory challenge to strike a black potential juror, she forgoes the possibility of excluding another potential juror with a similar *ex ante* likelihood of convicting. Put another way, even when black potential jurors are struck via peremptory challenges, they are essentially replaced on the jury by white jurors with similar attitudes towards the case.

Figures 1-3 illustrate the logic of this indirect effect on trial outcomes. We begin by considering a setting in which the jury pool is homogeneously white. Figure 1 depicts a normal distribution $\phi_w(x)$ with mean μ_w that characterizes the *ex ante* likelihood of conviction for white potential jurors. Jurors with higher values of x are more likely to convict; for example, the probability of conviction might be written $P(x) = \exp(x)/(1+\exp(x))$. To keep this illustration simple, we assume that jurors affect outcomes only through their position x and assume that the attorneys use their peremptory challenges to strike the potential jurors that are ex ante most hostile to their side; we discuss the implications of relaxing these assumptions below. In this way, defense attorneys strike those potential jurors with *ex ante* probabilities of conviction in the upper tails of the distribution while the prosecution strikes potential jurors in the

lower tail. If each attorney strikes a fixed percentage of the jury pool, the seated jury would consist of jurors drawn from truncated distributions with cutoffs x_H and x_L.[31]

Figure 1: The Distribution of x for White Jurors in Pool

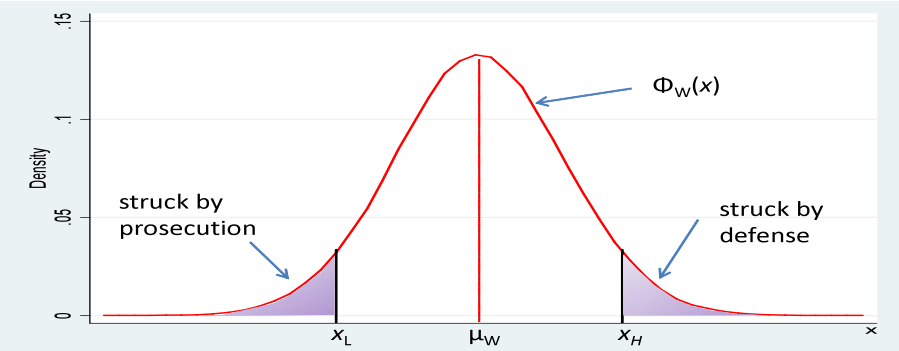


Figure 2 considers a setting with at least some black potential jurors in the pool. It depicts two normal distributions $\phi_w(x)$ and $\phi_B(x)$ with means μ_w and μ_B that determine the *ex ante* likelihood of conviction for white and black potential jurors, respectively. For expositional convenience, we have drawn normal distributions with the same variance and with $\mu_w > \mu_B$, which, given our main results above, might illustrate the case of a black defendant. An analogous figure that is consistent with our findings for white defendants could be created by switching the locations of $\phi_w(x)$ and $\phi_B(x)$ in the figure. As illustrated in Figure 2, compared to a world with only white potential jurors, adding black potential jurors to the pool puts more weight in the overall distribution of the jury pool on lower levels of x, thereby shifting the truncation points towards the location of the black distribution: to x_H* and x_L*. [32]

[31] Note that we ignore the fact that in practice a finite number of potential jurors are drawn from these distributions and so the truncation points will vary from case to case. This distinction does not alter the conclusions that we reach from this simple model of jury selection. Thus, to simplify the exposition, we essentially assume that a continuum of jurors is in the pool and that attorneys on each side can strike a fixed percentage of jurors.

[32] In thinking about where the truncation points should be drawn in Figure 2, it is important to keep in mind that the distribution function for the full jury will more closely resemble the distribution for whites since jury pools in the data are generally less than 5 percent black.

Figure 2: The Distribution of x for White and Black Jurors in Pool

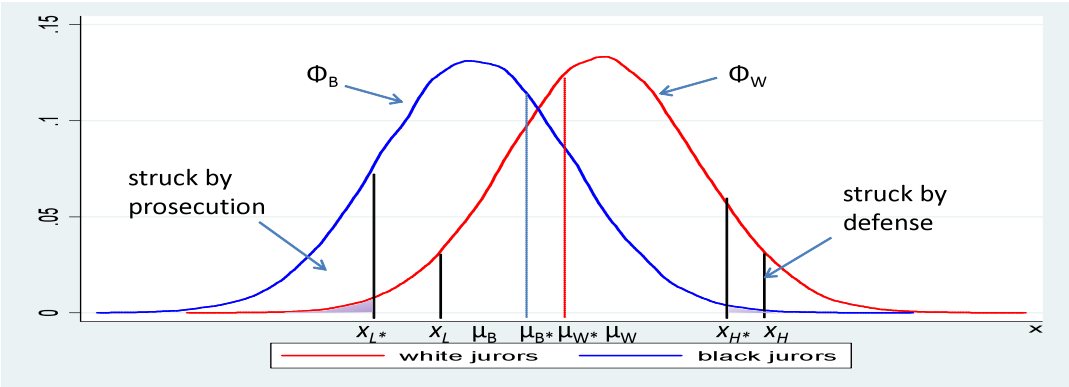
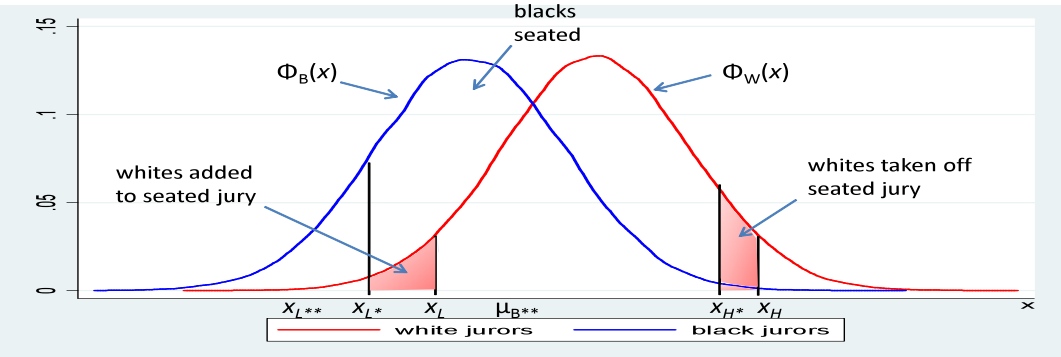


Figure 3 repeats Figure 2 but shades the regions of the distributions affected by the addition of some potential black jurors to the jury pool. There are two effects of adding blacks to the jury pool. First, those blacks with values of x between the truncation points x_H* and x_L* are seated on the jury – this leads to the *direct effect* described above, as the average position of seated black jurors μ_B* is lower than the average position of white jurors seated when the pool is all-white: μ_w. Second, because the prosecution now uses some of its peremptory challenges to strike black potential jurors drawn from the lower tail, it has fewer challenges left to remove potential white jurors with relatively low values of x. As a result, white jurors with *ex ante* likelihoods of conviction between the lower truncation points x_L and x_L* replace those between the higher truncation points x_H and x_H* on the seated jury. In this way, the presence of black potential jurors with low enough values of x such that they were excused via a peremptory challenge has the effect of pulling the *ex ante* likelihood of conviction of the marginal white member of the seated jury towards their own position. This is the *indirect effect* described above.

Because the black members of the jury pool that are seated are those with relatively high values of x, the mean of the truncated normal distribution that characterizes the *ex ante* likelihood of conviction for blacks on the seated jury is higher than that for the jury pool: μ_B* > μ_B. Notice also that the difference in the average position of black jurors seated on the jury relative to the white jurors seated when there is an all-white pool $|\mu_B$* - $\mu_w|$ is less than the impact on the position of the marginal seated juror when a

black member of the jury pool with a low value of x is struck via a prosecution's challenge. This suggests that the indirect effect has the potential to be quite large, even compared to the direct effect.

Figure 3: The Impact of Adding Black Jurors to the Jury Pool



Explaining the Observed Patterns of Trial Outcomes and Jury Selection

In addition to illustrating the indirect mechanism through which the racial composition of the jury pool can affect trial outcomes, this simple description of the jury selection process can also help explain a number of patterns in the data. Table 8 examines how the conviction rates of white and black defendants are related to the proportion of blacks on the *seated jury* for our two main dependant variables. Columns (1) and (4) repeat the corresponding reduced form (RF) estimates of the impact of the racial composition of the jury pool on conviction rates from Column (4) of Tables 4 and 5. Columns (2) and (5) show OLS estimates of the effect of the race of the seated jury on conviction rates while Columns (3) and (6) show the parameters from analogous specifications estimated using instrumental variables (IV). In all cases, the specifications correspond to the *benchmark* specification described above.[33] In the IV specifications, interactions of the proportion of blacks in the jury pool with defendant race are used as instruments for the analogous interactions of the proportion of blacks on the seated jury with defendant race.[34]

[33] That is, they include controls for the gender and age of the jury pool, county, and year of filing.

[34] The F-statistics associated with the first stage regression are 81.89 and 94.87 for whether there are any blacks seated and the interaction term, respectively. The IV specifications also naturally deal with measurement error problem that arises as a result of us not being able to explicitly identify the alternate juror(s).

There are two key things to take away from Table 8. The first is that the estimated OLS effect on the black-white conviction rate gap of adding a *black juror to the seated jury* is about the same size as the RF estimate of the impact of adding a *black potential juror to the pool*. The second thing to notice is that the estimated effects of jury race on the white-black conviction gap from the IV specification are about 2.5 times those of the OLS specification.[35]

There are two broad explanations for the pattern of results reported in Table 8. One possibility is that there are factors unobserved to us as researchers that affect the way that attorneys decide to seat potential jurors that induce correlation between the racial composition of the seated jury and the quality of evidence in the case. Any selection of this kind would lead to biases in simple OLS estimates of the composition of the seated jury on conviction rates. Under this explanation, the IV specifications reported above would naturally eliminate any such biases and we would interpret the IV estimate as the causal local average treatment effect (LATE) of the racial composition of the *seated jury* on trial outcomes.[36]

A second possible explanation is that the indirect effect described above is important. Under this explanation, the similarity of the OLS and RF estimates would be consistent with the notion that the addition of black potential jurors to the pool has a substantial effect – *regardless of whether or not they are actually seated.* In this case the IV estimates could not be interpreted as the LATE, as the instruments (racial composition of jury pool) would affect trial outcomes not only through their direct impact on the endogenous variables (racial composition of the seated jury) but also through their indirect impact on the identities of the white (and black) jurors who are seated.

It is important to emphasize that either of these explanations implies that the effect of jury race on the black-white conviction gap is 2.5 times greater than what the simple OLS estimates of the impact of racial composition of the seated jury would imply – i.e., that a comparison of the IV and OLS estimates provides a meaningful measure of how much is missed by the simple OLS approach regardless of which mechanism is at work in the data. Under the first explanation, the IV estimate provides the causal LATE, which is obviously 2.5 times greater than the OLS estimate. Under the second explanation, that the magnitude of the RF estimate is equal to the OLS estimate despite the fact that a black juror is seated in only about 40 percent of the cases that a black juror is in the pool implies that the indirect effect

[35] That the IV estimates are roughly 2.5 greater than the RF estimates follows directly from the fact that black potential jurors are seated on the jury about one-third of the time for both white and black defendants; as a result, a first stage regression of whether any blacks are seated on the jury on whether there are any blacks in the jury pool has a coefficient of about 0.40. This number is greater than one third because the probability that at least one black juror is seated is higher when there are multiple black members of the pool.

[36] To be consistent with the OLS and IV estimates presented above, this form of selection would have to cause blacks to be more likely to be seated in cases in which (i) black defendants are significantly more likely to be guilty and (ii) white defendants are more likely to be not guilty, for reasons that are unobserved to the researcher (but possibly not the attorneys).

(operating in the other 60 percent of the cases) must be roughly the same size as the OLS estimate.[37] In this way, the total impact of jury race on trial outcomes is 2.5 times greater than what the OLS estimate of the impact of the racial composition of the seated would imply; the only uncertainty is over which of these mechanisms (or some combination of the two) explain this understatement.

While not conclusive, a number of other aspects of the data and simple theory lead us to believe that the indirect mechanism is the more plausible explanation for the difference between the OLS and IV estimates of the effect of the race of the seated jury. First, the logic illustrated in Figures 1-3 suggests that the indirect effect might in fact be quite large relative to the direct effect. Second, the within-race heterogeneity depicted in the figures also provides a direct explanation for why black members of the jury pool might be seated at rates roughly comparable to their white counterparts. In particular, as long as there is a significant amount of overlap in the *ex ante* probabilities of conviction for white and black potential jurors, the significant fraction of black members of pool with values of x between the truncation points x_H* and x_L* will be seated. Third, the extent of selection related to unobserved case and defendant attributes that would be necessary to explain the difference between the IV and OLS results under the first explanation would be substantial. Not only can we not provide any obvious theoretical grounds for this kind of selection, but there is little systematic correlation between the composition of the seated jury and the *observable* case and defendant characteristics.[38] For all of these reasons, we tend to favor the indirect mechanism, while recognizing that it is impossible to be completely conclusive on this point.

Interpreting the Magnitude of the Estimated Effects

If the simple theoretical framework illustrated in Figures 1-3 approximates the jury selection process and trial outcomes are only a function of the x positions of the members of the seated jury, the magnitudes of our main findings imply that the distributions of the *ex ante* conviction rates must be fairly diffuse. In particular, our results suggest that by randomly adding just one to two black jurors to a pool of 27 potential jurors, conviction rates for white defendants increase by 6-11 percentage points (depending

[37] More precisely, the OLS estimate of the effect of the racial composition of the seated jury on trial outcomes is the difference in the average outcome in cases in which a black juror is seated relative to cases in which the seated jury is all-white. Of course, all-white juries occur both (i) when there are no black jurors in the pool and (ii) when any black juror(s) in the pool are not seated on the jury. In this way, the OLS estimate is actually a weighted average of (i) the full direct effect and (ii) the direct effect minus the indirect effect. Thus, the fact that the RF and OLS estimates are similar actually implies the direct effect is actually somewhat larger than the indirect effect. In this way, the OLS estimate actually slightly understates the full magnitude of the direct effect *and* completely misses the indirect effect. Taken together, these misses amount to the difference between the OLS and IV estimates.

[38] In particular, when we repeat the analysis shown in Table 2 replacing the composition of the jury pool with that of the seated jury, the coefficient estimates are somewhat larger on average but remain largely statistically insignificant.

on the exact specification) and decrease by a comparable amount for black defendants.[39] We draw attention here to two considerations that have implications for interpreting the magnitudes of the effects.

First, it is important to note that of all the possible cases that a district attorney (prosecutor) could bring against potential defendants, a very small fraction go to trial and are decided by a jury verdict. On the one hand, in cases where the quality of the evidence is insufficient to generate a reasonable *ex ante* probability of conviction, the prosecution is likely to drop the charges rather than bring the case to trial. This has the benefit of saving time spent preparing and presenting the case at trial and preserving reasonably high conviction rates for cases brought to trial, a metric on which prosecutors are often judged. Likewise, in many cases where both sides expect a guilty verdict, pre-trial plea bargains are reached; these minimize the prosecutor's trial costs and ensure a guilty verdict, often in exchange for a lighter sentence. In fact, almost 90 percent of criminal defendants in U.S. District Courts plead guilty and 97 percent of all convictions are the result of plea rather than a conviction by a court or jury.[40] As a result of these pre-trial selection mechanisms, the set of cases that go to trial are systematically more likely to be those where the quality of the evidence is in considerable dispute among the parties. Thus, it might not be terribly surprising if potential jurors have fairly diffuse *ex ante* conviction rates for this especially select subset of cases.

Second, as we mentioned above, it may be possible for certain members of the jury to have an impact on the trial and deliberations that goes beyond the impact of their *ex ante* likelihood of conviction. If the inclusion of a black member on the seated jury impacts the way that the trial is presented by the attorneys or the way that white jurors deliberate, the seated black juror could essentially pull the other members of the jury towards his or her position, thereby strengthening the *direct* effect described above. Of course, we would generally expect the attorneys to take this into account and, therefore, be more likely to strike black jurors *ceteris paribus*. In the example illustrated in Figure 3, this would have the effect of shifting the threshold for black potential jurors higher, resulting in black potential jurors being seated at lower rates and those that were seated being more systematically selected from the upper portion of the distribution of *ex ante* conviction rates and, therefore more similar to white jurors.

This rationale for striking more black potential jurors may be countered, however, by concerns among attorneys about not wanting to use (or to appear to be using) race as a factor in exercising their peremptory challenges. If attorneys in fact place some weight on seating black jurors roughly in

[39] While we have attempted to remain agnostic throughout the paper about how juries with heterogeneous *ex ante* conviction probabilities reach unanimous decisions in cases that are not clear cut (and juries generally return verdicts in almost every case), it is worth noting that the existing literature **(**Kalvin and Ziesel,1966, Hastie, Penrod, and Pennington, 1983, and Sandys and Dillehay, 1995**)** suggests that majority rule is the most appropriate way to model these decisions

[40] See http://www.uscourts.gov/Statistics/JudicialFactsAndFigures/JudicialFactsAndFigures2009.aspx.

proportion to their representation in the jury pool when using their peremptory challenges, they may set the *ex ante* conviction rate threshold for black potential jurors distinctly than that for whites.[41] Returning to Figure 3, by setting a threshold for seating black potential jurors at a value x_L** below x_L*, prosecutors would seat a higher fraction of black jurors, thereby also lowering the mean position of the seated black jury members, μ_B**. This would tend to increase the size of the direct effect without having much impact on the indirect effect.

6. Implications and Conclusion

Given the main findings presented in Section 4 and the discussion of potential mechanisms in Section 5, we conclude the paper with a discussion of the implications of our results for the fair and equal application of the law. Most plainly, our main findings imply that conviction rates for black and white defendants are similar when there is at least some representation of blacks in the jury pool but that in the absence of such representation, black defendants are substantially more likely to be convicted. Defendants of each race do relatively better when the jury pool contains more members of their own race and, as a result, black defendants are clearly disadvantaged relative to their white counterparts when the proportion of blacks in the jury pool is so small.

Another immediate implication of our main findings is that the application of criminal justice in these Florida counties is highly uneven, as a small change in the composition of the jury pool (i.e., adding one black member) has a large impact on the conviction rates of black versus white defendants. While heterogeneity in the jury pool is obviously unavoidable, a potentially desirable feature of a justice system is that jury verdicts are not arbitrary given the evidence. In this context, increasing the number of jurors on the seated jury would substantially reduce the variability of the trial outcomes, increase black representation in the jury pool and on seated juries, and make trial outcomes more equal for white and black defendants.[42]

What our results imply regarding the fairness of jury trials for defendants of each race is much more difficult to say. As the discussion of Section 5 makes clear, when jurors have heterogeneous likelihoods of conviction, any random variation in the jury pool will affect the likelihood that the seated jury convicts the defendant. But, such a model has nothing to say about which juror in the distribution is applying the most appropriate *ex ante* standard of evidence for defendants of each race. The problem is

[41] Note that if prosecutors had especially high rates of excluding black potential jurors when the defendant was black, this pattern would be straightforward to detect over time using a data set like the one used in our analysis.

[42] See Waters (2004) for a review of the existing literature concerned with the effect of jury size on court costs, jury representativeness, and the variability of trial outcomes (particularly in civil cases). For instance, Zeisel (1971) suggests that if a population is comprised of a minority of 10 percent, then a sample of 12-person juries will have a 72 percent chance of seating at least one such minority, but a sampling of 6-person juries will only have a 47 percent chance of seating a minority.

that without any direct measure of the objective strength of the evidence that is brought in cases with black versus white defendants, we have no way of discerning what relative conviction rates for black versus white defendants should be. If, in fact, the quality of the evidence brought in the cases of white and black defendants in our sample is comparable, our results would imply that juries formed from all-white jury pools require a weaker standard of evidence to convict black versus white defendants. This is a very serious potential implication of our analysis, but one that we cannot reach conclusively without knowing more about the quality of evidence presented in each case.

While gauging the objective quality of the evidence in the cases in our sample is beyond the scope of this paper, future research could use objective and subjective analyses of the trial transcripts in these cases to provide further insight into the fairness question.[43] If, for example, experimental subjects were presented with trial transcripts (neutral as to the race of the defendants), it would be possible to measure whether the quality of the evidence in the cases with black defendants was in fact comparable to those with white defendants. Such an analysis could be done within crime category and could conceivably test whether black and white experimental subjects respond differently to the evidence, when presented in a way that did not directly indicate the race of the defendant.

A final implication of our analysis follows from the fact that trials with all-white jury pools result in *higher* conviction rates for black defendants and *lower* conviction rates for whites relative to jury pools with at least one black potential juror. This pattern is generally inconsistent with a world in which jurors of each race apply the same standard of evidence for defendants of both races. More specifically, if jurors of each race perceive the evidence presented in a trial identically and apply the same standard of evidence to white and black defendants, it may be possible for jurors of one race to require a higher (lower) standard of evidence to convict and, therefore, convict *defendants of both races* less (more) often. Importantly, in this case, if jurors are applying the same standards, it is impossible for conviction rates for defendants of one race to rise while those for defendants of the other race fall *no matter what the distribution of quality of evidence is for defendants of each race* (Anwar and Fang, 2006). Put another way, if jurors of one race are generally tougher, then they had better be tougher on all defendants or the evidence would suggest that they are not applying the same standards.

The crossing pattern exhibited by our main findings thus leads to our final conclusion: that jurors of at least one race (and possibly both) either interpret evidence differently depending on the race of the defendant or use a standard of evidence that varies with the race of the defendant. Either possibility implies that the interaction of defendant and jury race fundamentally alters the mapping of evidence to conviction rates and thus that the impact of the racial composition of the jury pool (and seated jury) is a

[43] To date we have not been able to gain access to the transcripts for the trials used in the analysis presented in this paper.

factor that merits much more attention and analysis in order to ensure the fairness of the criminal justice system.

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Table 1. Summary Statistics

	All Lake and Sarasota Cases		All Lake Cases		All Sarasota Cases		Black Defendants in Lake and Sarasota		White Defendants in Lake and Sarasota	
	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd	Mean	Sd
Defendant Characteristics										
Def_Black	0.439	0.497	0.501	0.501	0.382	0.486	1	0	0	0
Def_Hisp	0.043	0.202	0.024	0.154	0.06	0.238	0	0	0	0
Def_White	0.513	0.500	0.472	0.500	0.551	0.498	0	0	1	0
Def_Male	0.919	0.273	0.931	0.254	0.908	0.29	0.954	0.208	0.887	0.318
Case Characteristics										
Drugs (Any Charge)	0.253	0.435	0.219	0.414	0.284	0.452	0.375	0.485	0.137	0.345
Murder (Any Charge)	0.053	0.224	0.080	0.272	0.027	0.164	0.066	0.249	0.047	0.213
Other (Any Charge)	0.327	0.470	0.320	0.467	0.334	0.472	0.264	0.442	0.367	0.483
Other_Violent (Any Charge)	0.307	0.461	0.349	0.477	0.267	0.443	0.309	0.463	0.303	0.460
Property (Any Charge)	0.233	0.423	0.259	0.438	0.209	0.407	0.210	0.408	0.251	0.434
Robbery (Any Charge)	0.090	0.287	0.099	0.299	0.082	0.275	0.147	0.355	0.047	0.213
Sex (Any Charge)	0.131	0.338	0.128	0.335	0.135	0.342	0.081	0.273	0.179	0.384
Weapons (Any Charge)	0.120	0.325	0.160	0.367	0.082	0.275	0.183	0.387	0.079	0.270
Total_Charges	2.994	3.567	3.465	4.565	2.551	2.18	2.791	2.333	3.264	4.546
Dependent Variables										
Pct_Guilty	0.670	0.439	0.584	0.458	0.756	0.401	0.686	0.432	0.641	0.450
Any Guilty	0.728	0.445	0.653	0.477	0.803	0.399	0.745	0.437	0.702	0.458
Pool and Seated Jury Characteristics										
Number_Jury_Seated	7.113	0.483	7.307	0.500	6.928	0.384	7.12	0.476	7.116	0.496
Number Jury_Pool	27.292	7.294	26.956	7.410	27.613	7.175	26.874	7.007	27.631	7.593
Any_Black_Pool	0.639	0.480	0.758	0.429	0.526	0.5	0.628	0.484	0.654	0.476
Any_Black_Seated	0.275	0.447	0.362	0.481	0.192	0.394	0.288	0.454	0.264	0.441
Pct_Black_Seated	0.046	0.080	0.061	0.089	0.031	0.068	0.051	0.089	0.040	0.069
Pct_Black_Pool	0.039	0.040	0.051	0.044	0.028	0.032	0.04	0.043	0.038	0.038
Pct_Fem_Seat	0.517	0.196	0.497	0.196	0.536	0.194	0.532	0.193	0.504	0.199
Pct_Fem_Pool	0.508	0.097	0.506	0.099	0.51	0.095	0.509	0.096	0.505	0.099
Pct_Young_Seated	0.234	0.172	0.271	0.172	0.199	0.164	0.24	0.181	0.236	0.165
Pct_Young_Pool	0.247	0.094	0.270	0.091	0.224	0.091	0.252	0.094	0.245	0.092
Pct_MiddleAge_Seated	0.488	0.184	0.473	0.179	0.502	0.188	0.497	0.189	0.483	0.176
Pct_MiddleAge_Pool	0.483	0.098	0.469	0.096	0.495	0.099	0.482	0.101	0.485	0.096
N	785		384		401		333		379	

Note - The 785 cases include all cases, regardless of defendant race. The latter two subsamples of blacks (N=333) and whites (N=379) exclude Hispanics and those cases where the dependent variables, e.g. anyguilty, are not defined. In addition, the crime specific dependent variables are only defined for those cases in which a jury verdict is reached. That is, the 'any drug convictions' variable is defined for the subsample of cases where there was a drug charge that resulted in a jury verdict.

Table 2. The Relationship Between Jury Pool and Defendant/Case Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	pctpool_bl	pctpool_wh	pctpool_other	pctpool_fem	pctpool_young	pctpool_middle	pctpool_old
Defendant Characteristics							
def_black	0.003	-0.004	0.001	0.001	0.011	-0.002	-0.009
	[0.003]	[0.005]	[0.003]	[0.008]	[0.008]	[0.008]	[0.008]
def_hisp	0.004	-0.003	-0.001	0.025	-0.016	-0.011	0.028
	[0.008]	[0.011]	[0.006]	[0.016]	[0.018]	[0.018]	[0.021]
def_male	0.006	-0.009	0.002	-0.002	0.025**	-0.007	-0.018
	[0.005]	[0.007]	[0.004]	[0.012]	[0.011]	[0.014]	[0.014]
Case Characteristics							
drugs	0	0.004	-0.003	0.014	-0.015	0.006	0.008
	[0.004]	[0.006]	[0.004]	[0.010]	[0.010]	[0.011]	[0.010]
murder	-0.002	-0.006	0.006	0.013	0.004	-0.011	0.007
	[0.006]	[0.008]	[0.005]	[0.014]	[0.013]	[0.014]	[0.014]
other	0.002	-0.004	0	0.002	-0.005	0.01	-0.005
	[0.004]	[0.005]	[0.003]	[0.008]	[0.008]	[0.008]	[0.008]
other_violent	0.004	-0.004	0	0.012	-0.002	-0.004	0.007
	[0.004]	[0.005]	[0.003]	[0.009]	[0.008]	[0.008]	[0.008]
property	0.013***	-0.006	-0.008**	0.007	0.004	-0.007	0.003
	[0.005]	[0.006]	[0.003]	[0.010]	[0.009]	[0.010]	[0.010]
robbery	-0.005	0.004	0	-0.002	-0.011	-0.009	0.02
	[0.005]	[0.008]	[0.005]	[0.014]	[0.012]	[0.013]	[0.013]
sex	0.002	0.001	-0.004	0.02	-0.011	-0.006	0.017
	[0.005]	[0.006]	[0.004]	[0.012]	[0.012]	[0.012]	[0.012]
weapons	-0.001	0.001	0	0.005	0.001	-0.003	0.002
	[0.004]	[0.006]	[0.004]	[0.011]	[0.010]	[0.012]	[0.011]
total_charges	0	0	0	0	0.002*	-0.002**	0
	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
Constant	0.028***	0.942***	0.029***	0.496***	0.221***	0.497***	0.282***
	[0.006]	[0.007]	[0.005]	[0.013]	[0.012]	[0.015]	[0.015]
Observations	771	771	771	771	771	771	771
R-squared	0.02	0.01	0.01	0.01	0.02	0.01	0.01

Robust standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Cross Tabulations of Conviction Rates and Racial Composition of Jury Pool

		Black Defendants	
		any guilty = 0	any guilty = 1
Any blacks in the pool	0	24 (19%)	100 (81%)
	1	61 (29%)	148 (71%)

		White Defendants	
		any guilty = 0	any guilty = 1
Any blacks in the pool	0	45 (34%)	86 (66%)
	1	68 (27%)	180 (73%)

Table 4. Reduced Form Baseline Regressions for Dependant Variable = Any Guilty

	(1)	(2)	(3)	(4)
def_black	0.150***	0.157***	0.172***	0.164***
	[0.056]	[0.057]	[0.057]	[0.058]
any_black_pool	0.069	0.085*	0.118**	0.105**
	[0.048]	[0.049]	[0.050]	[0.051]
def_black*any_black_pool	-0.168**	-0.173**	-0.177**	-0.166**
	[0.070]	[0.071]	[0.072]	[0.074]
Constant	0.656***	0.645***	0.616***	0.627***
	[0.039]	[0.040]	[0.040]	[0.041]
Includes Controls for:				
Gender/Age of Pool	No	Yes	Yes	Yes
County Dummy	No	No	Yes	Yes
Year of Filing Dummies	No	No	No	Yes
Observations	712	712	712	712
R-squared	0.01	0.02	0.05	0.07

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

All control variables are demeaned and interacted with def_black.

Table 5. Reduced Form Baseline Regressions for Dependant Variable = Pct Guilty

	(1)	(2)	(3)	(4)
def_black	0.156***	0.163***	0.179***	0.160***
	[0.055]	[0.056]	[0.056]	[0.057]
any_black_pool	0.063	0.077	0.113**	0.090*
	[0.047]	[0.049]	[0.049]	[0.050]
def_black*any_black_pool	-0.174**	-0.181***	-0.182**	-0.155**
	[0.069]	[0.070]	[0.071]	[0.072]
Constant	0.600***	0.590***	0.558***	0.576***
	[0.038]	[0.039]	[0.039]	[0.040]
Includes Controls for:				
Gender/Age of Pool	No	Yes	Yes	Yes
County Dummy	No	No	Yes	Yes
Year of Filing Dummies	No	No	No	Yes
Observations	712	712	712	712
R-squared	0.01	0.02	0.05	0.08

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

All control variables are demeaned and interacted with def_black.

Table 6. Robustness/Sensitivity Checks

	(1)	(2)	(3)	(4)	(5)	(6)
def_black	0.164***	0.149**	0.126**	0.134***	0.163***	0.142**
	[0.058]	[0.063]	[0.060]	[0.051]	[0.058]	[0.055]
any_black_pool	0.105**	0.092*	0.098*	0.075*	0.086*	0.07
	[0.051]	[0.053]	[0.052]	[0.045]	[0.050]	[0.048]
def_black*any_black_pool	-0.166**	-0.139*	-0.130*	-0.135**	-0.156**	-0.160**
	[0.074]	[0.080]	[0.076]	[0.065]	[0.073]	[0.070]
Constant	0.627***	0.635***	0.636***	0.697***	0.613***	0.667***
	[0.041]	[0.042]	[0.042]	[0.036]	[0.040]	[0.039]
Sample Notes	Main Sample	Main Sample	Main Sample	Includes Lake cases that are pled as guilty jury verdict	Includes Sarasota non-verdict cases as not guilty jury verdict	Includes Sarasota non-verdict cases as guilty jury verdict
Benchmark Controls	Yes	Yes	Yes	Yes	Yes	Yes
Defendant and Case Characteristics	No	Yes	No	No	No	No
Judge Dummies	No	No	Yes	No	No	No
Observations	712	710	709	845	737	737
R-squared	0.07	0.11	0.13	0.04	0.05	0.05

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

The dependant variable in all regressions is Any guilty. All benchmark controls are demeaned and interacted with def_black. Defendant and case characteristic variables are demeaned and interacted with anypool_bl. Judge fixed effects are demeaned and interacted with def_black.

Table 7. Heterogeneity Across Charge Category (Drugs, Violent Offenses, Property Offenses) and County

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable =	Any guilty	Any guilty	Any guilty	Any Drug Convictions	Any Violent Convictions	Any Property Convictions
def_black	0.150***	0.223**	0.127**	0.244**	0.085	0.097
	[0.056]	[0.101]	[0.063]	[0.114]	[0.097]	[0.140]
any_black_pool	0.069	0.149*	0.085	0.19	0.081	-0.025
	[0.048]	[0.084]	[0.057]	[0.128]	[0.088]	[0.108]
def_black*any_black_pool	-0.168**	-0.201*	-0.160*	-0.474***	-0.210*	0.102
	[0.070]	[0.116]	[0.088]	[0.152]	[0.119]	[0.167]
Constant	0.656***	0.500***	0.730***	0.650***	0.675***	0.640***
	[0.039]	[0.073]	[0.043]	[0.095]	[0.072]	[0.092]
Sample	All (baseline)	Lake County	Sarasota County	Drug charges that reach jury verdict	Violent crime charges that reach jury verdict	Property crime charges that reach jury verdict
Observations	712	363	349	156	267	152
R-squared	0.01	0.02	0.01	0.09	0.02	0.03

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

No additional controls are included in the above regressions.

Table 8. Benchmark Estimates for Reduced Form, OLS, and IV

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable=		Any guilty			Pct guilty	
def_black	0.164***	0.101**	0.167***	0.160***	0.105***	0.162***
	[0.058]	[0.040]	[0.060]	[0.057]	[0.039]	[0.058]
any_black_pool	0.105**			0.090*		
	[0.051]			[0.050]		
def_black*any_black_pool	-0.166**			-0.155**		
	[0.074]			[0.072]		
any_black_seated		0.06	0.269**		0.057	0.229*
		[0.054]	[0.131]		[0.053]	[0.128]
def_black*any_black_seated		-0.164**	-0.405**		-0.162**	-0.375**
		[0.078]	[0.179]		[0.076]	[0.174]
Constant	0.627***	0.681***	0.624***	0.576***	0.621***	0.574***
	[0.041]	[0.027]	[0.042]	[0.040]	[0.027]	[0.041]
Estimation Method	Reduced Form	OLS	IV	Reduced Form	OLS	IV
Observations	712	712	712	712	712	712
R-squared	0.07	0.07	0.04	0.08	0.08	0.07

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Note that all specifications include the complete set of benchmark controls, which are demeaned and interacted with def_black.

Thus, columns (1) and (4) correspond to the final column of Tables 4 and 5, respectively.