Racial Bias by Prosecutors: Evidence from Random Assignment

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Abstract

Racial disparities in criminal justice outcomes are well-documented. However, there is little evidence on the extent to which racial bias by prosecutors is responsible for these disparities. This paper tests for racial bias in conviction by prosecutors. To identify effects, I leverage as good as random variation in prosecutor race using detailed administrative data on the case assignment process and case outcomes in New York County, New York. I show that the assignment of an opposite-race prosecutor leads to a 5 percentage point ($\sim$ 8 percent) increase in the likelihood of conviction for property crimes. I find no evidence of effects for other types of crimes. Additional results indicate fewer dismissals by opposite-race prosecutors likely drive my property crime estimates.

1   Introduction

In the United States, there is widespread recognition of racial disparities in criminal justice outcomes. Black Americans are four times as likely to have a criminal record and to have been incarcerated compared to non-blacks (Shannon et al., 2017). Despite public concern that the system is unfair to black and Hispanic Americans (Rasmussen Reports, 2014), little is known about whether these disparities are caused by bias. Recently, legal scholars and judges have hypothesized that prosecutors could play a central role in perpetuating these racial disparities.[1] This is because prosecutors have arguably more discretion than any other party when it comes to the handling of alleged crimes.[2] In particular, prosecutors choose whether and how to dismiss a case, assign charges, offer plea deals, strike potential jury members, and handle a case at trial. However, there is little causal evidence on whether prosecutors exhibit racial bias in making these decisions. The purpose of this paper is to test for prosecutor racial bias in convictions by estimating the effect of being assigned an opposite-race prosecutor.

The primary difficulty in testing for racial bias by prosecutors is the non-random matching of prosecutors and defendants. Non-random matching is commonplace and occurs if prosecutors are allowed to choose their cases during screening. To overcome this endogeneity concern, I exploit the random assignment, conditional on screening date, of defendants to prosecutors in New York County through the Early Case Assessment Bureau. At the Early Case Assessment Bureau, where most defendants are brought immediately after their arrest, defendants who commit misdemeanors are assigned to a prosecutor on duty. Prosecutors are not able to select which cases they prosecute when they are on duty. Under the assumption

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[1]e.g. Foster v. Chatman, 2016; Abelove v. Cuomo, 2017; Pfaff, 2017; Rehavi and Starr, 2014

[2]Many academics note the power of prosecutors. For example, see Luna and Wade (2015), Pfaff (2017), Sklansky and Sklansky (2016), and Stith (2008).

that prosecutors are as good as randomly assigned to cases, the variation in prosecutor race should be uncorrelated with a defendant's underlying guilt. Consequently, some defendants are randomly assigned, conditional on case screening date, to prosecutors of their own-race while others are paired with opposite-race prosecutors. I also provide empirical evidence for this random assignment by showing that prosecutor race is uncorrelated with defendant and case characteristics. I use this quasi-random variation in prosecutor race to identify opposite-race effects. Similar to other studies on racial bias (e.g. Price and Wolfers, 2010; Parsons et al., 2011; Anbarci and Lee, 2014; West, 2018), I estimate opposite-race effects by differencing the role of defendant and prosecutor race.[3]

I identify effects using detailed administrative data from the New York County District Attorney's Office and collected by the Vera Institute (Kutateladze, 2017). The New York County District Attorney's Office prosecutes all cases originating in New York County (Manhattan), over 100,000 each year, and is one of the nation's largest prosecutors' offices. The New York County District Attorney's Office also advertises itself as being especially progressive due to its commitment to criminal justice reform, community partnerships, and reducing bias (Manhattan District Attorney, 2018b). The data collected by the Vera Institute include information on the case assignment process, as well as dismissal, and conviction decisions for all cases assigned via the Early Case Assessment Bureau.

Results show there is significant evidence of prosecutorial bias against opposite-race defendants for property crimes, though not for other crimes. I estimate that being assigned an opposite-race prosecutor increases the probability of guilt by 5 percentage points (~ 8

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[3]This paper focuses on the effect of opposite-race prosecutors. However, I also estimate the effect of prosecutor race on conviction. Results are shown in Table A2. Here I regress *Guilty* on indicators for prosecutor race. Overall, I find some suggestive evidence that white prosecutors increase the probability of defendant guilt by 2 percentage points (3.5 percent) for the entire sample. I also show being assigned a white prosecutor increases the probability of guilt by 2 percentage points (3 percent) for property crimes only. This result is robust to the inclusion of controls in Column 2.

percent) for property crimes. This difference represents 30 percent of the black-white gap in conviction rates for property crimes. Additional results indicate these differences are likely driven by decreased dismissal of cases by opposite-race prosecutors. Further, as more than 65% of prosecutors may contribute to the average opposite-race bias estimate, these results cannot be explained by a few "bad apple" prosecutors. Results are also robust to multiple inference correction.

To my knowledge, this is the first paper to use as good as random variation in opposite-race prosecutors to estimate racial bias. This is of particular importance given the sparse empirical research on prosecutors despite their power and discretion. This paper primarily contributes to a literature on prosecutors, and complements existing work on defense attorneys, in-group bias and discrimination the criminal justice system.

By providing the first evidence of prosecutor opposite-race bias, this paper contributes to a small, but growing, literature on prosecutors (Rehavi and Starr, 2014; Tuttle, 2019; Yang, 2016).[4] It is most similar to Rehavi and Starr (2014), and Tuttle (2019). Rehavi and Starr (2014) uses a selection-on-observables approach and reports that prosecutors may be responsible for racial disparities in federal sentencing. By considering abnormal bunching in crack-cocaine amounts used for federal sentencing, Tuttle (2019) shows that black and Hispanic defendants receive harsher drug sentences. This is likely driven by prosecutors shifting drug amounts just over a quantity threshold, triggering mandatory minimum sentences. However, there are lingering concerns that racial differences in sentencing for both papers could be driven by prosecutor selection of cases.[5] It is also possible that un-

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[4]To my knowledge the only other causal paper on prosecutor behavior, aside from Tuttle (2019), is Yang (2016). Using pension eligibility and judge deaths as an instrument for judicial vacancies and resources constraints, Yang (2016) finds that vacancies and resource constraints cause prosecutors to decline to prosecute and dismiss more cases.

[5]For example, prosecutors could always choose to prosecute cases with black defendants when they know the case has better evidence.

observable differences between defendants, rather than prosecutor racial bias, explain the sentencing disparities. This paper addresses these concerns by using the randomization of defendants to prosecutors, which allows me to isolate opposite-race bias. Further, I can test for racial bias in multiple prosecutor decisions across different types of cases. There are also several suggestive papers which conclude defendant race may alter prosecutor decision making at multiple stages such as initial screening,[6] pretrial detainment,[7] dismissal,[8] guilty pleas,[9] and sentencing.[10] These papers are summarized in Kutateladze and Andiloro (2014), and Kutateladze et al. (2012).

By considering the role of prosecutors, it complements a larger related literature documenting the effects of defense attorneys (e.g. Abrams and Yoon, 2010; Agan et al., 2018; Anderson and Heaton, 2012; Cohen, 2014; Iyengar, 2007; Roach, 2012; Shem-Tov, 2016). This paper also relates to a large literature on racial and gender discrimination or in-group bias in the criminal justice system. This literature has documented effects by police officers,[11] judges,[12] and juries.[13]

The results of this paper have several important implications. First, my results imply that in-group bias can persist despite the widespread focus on prosecutor training on equal treatment.[14] This study's finding of racial bias for property crimes is particularly striking given

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[6]e.g. Albonetti and Hepburn, 1996; Bishop et al., 2010; Franklin, 2010; Freiburger and Jordan, 2011; Kingsnorth et al., 1998; Kingsnorth and Macintosh, 2004; Kutateladze et al., 2014; Leiber and Johnson, 2008; Holleran et al., 2010; Riedel and Boulahanis, 2007; Sorensen and Wallace, 1999; Spears and Spohn, 1997; Spohn and Spears, 1996; Pyrooz et al., 2011; Wooldredge and Thistlethwaite, 2004

[7]e.g. Demuth and Steffensmeier, 2004; Demuth, Demuth; Freiburger and Hilinski, 2010; Kutateladze et al., 2014

[8]e.g. Franklin, 2010; Kutateladze et al., 2014; Spohn and Homey, 1993; Wooldredge and Thistlethwaite, 2004

[9]e.g. Albonetti, 1992

[10]e.g. Hartley et al., 2007; Johnson, 2005; Johnson and Betsinger, 2009; Kutateladze et al., 2014; Shermer and Johnson, 2010; Spohn and Fornango, 2009; Ulmer et al., 2007

[11]e.g. Antonovics and Knight, 2009; Anwar and Fang, 2006; Goncalves and Mello, 2018; Grogger and Ridgeway, 2006; Horrace and Rohlin, 2016; Knowles et al., 1999; Pierson et al., 2017; Sanga, 2009; West, 2018

[12]e.g. Depew et al., 2017; Eren and Mocan, 2018; Gazal-Ayal and Sulitzeanu-Kenan, Gazal-Ayal and Sulitzeanu-Kenan; Johnson, 2014; Knepper, 2017; Lim et al., 2016; Schanzenbach, 2005; Shayo and Zussman, 2011; Steffensmeier and Hebert, 1999

[13]e.g. Anwar and Fang, 2006; Anwar et al., 2018; Hoekstra and Street, 2018

[14]Most prosecutor training emphasizes the equal treatment of defendants. Specifically, in New York, prosecutor guidelines illustrate this goal (District Attorneys Association for the State of New York, 2015).

that I study the New York County District Attorney's Office, which is known for actively claiming to combat racial discrepancies in criminal justice outcomes (Manhattan District Attorney, 2018b). For example, since 2010 the New York County District Attorney's Office has stopped prosecuting most low-level infractions and offers a treatment program instead of probation for low-level drug crimes. Both policies are described as being particularly important for communities of color (Cyrus Vance For District Attorney, 2017). They also employ a Chief Diversity Officer and Diversity Committee because they believe a diverse staff can help reduce racial bias (Manhattan District Attorney, 2018a).

Second, as the majority of defendants are black and prosecutors are white, the consequences of opposite-race bias are disproportionately borne by black Americans. These costs often extend beyond the courtroom or jail. Perhaps the most significant of these costs is the worsened labor market outcomes attributed to increased convictions and thus criminal records (Holzer et al., 2007; Pager, 2003). Other long-term ramifications, such as increased use of welfare programs, decreased mental health, less access to public housing, as well as negative impacts on children, are also associated with having a criminal record (e.g. Curtis et al., 2013; Dobbie et al., 2018; Johnson, 2009; Murray and Farrington, 2012; Wolff and Shi, 2012). Finally, the results of this paper have compelling implications for reducing racial disparities. Estimates presented here suggest that fair treatment by prosecutors could reduce the black-white gap in property crime convictions by about one-third. However, it is also important to recognize that for about half (62 %) of the crimes in my sample, and 41% of prosecutors, I do not find strong evidence of racial bias.[15] Therefore, I conclude that prosecutors may be treating many cases fairly. This highlights the great potential for prosecutors to alter racial disparities and the need to better understand the scenarios in which bias occurs.

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[15]Here, and for all heterogeneous treatment effects by prosecutor, I only consider prosecutors with more than 100 cases.

2 Background and Data

2.1 Case Assignment and the Prosecutors' Role in New York County

The random assignment of cases to prosecutors is critical to this research design. In New York County, after a defendant is arrested, the police are responsible for recording all arrest charges and prior arrest history.[16] Next, the police fax or email misdemeanor and felony cases to the Early Case Assessment Bureau, where the cases are assigned to a prosecutor.[17][18] Felony and misdemeanor cases follow a different assignment procedure at the Early Case Assessment Bureau. Misdemeanors are assigned randomly to prosecutors on duty. For felonies, a supervisor screens the cases and then assigns them to prosecutors based on their experience with particular types of cases. Because the assignment of felony cases is not random, I exclude them from my analysis. Each month 6-8 first-year prosecutors are assigned to work at the Early Case Assessment Bureau to handle misdemeanor cases. At the beginning of each month, prosecutors will be assigned specific days and shifts (day or night) to work.[19] Misdemeanor prosecutors are assigned specific work days and shifts by a supervisor.[20] All first-year prosecutor will work at the Early Case Assessment Bureau as part of their training.

Prosecutors are not able to select which cases they will prosecute. Rather, cases are assigned to a prosecutor based on arrest date. For example, after each misdemeanor arrest, the case is emailed or faxed to an administrator in the Early Case Assessment Bureau. She will print out the case and supporting documents, time stamp the case, and then place these

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[16]The defendant is also fingerprinted and this information is sent off to conduct a complete criminal history search. A defendant's full criminal history will be added to the case at the Early Case Assessment Bureau or after arraignment.

[17]Infractions and violations (less serious offenses) are often given desk appearance tickets or court summons (at the discretion of the police officer) and are not assigned to a prosecutor at the Early Case Assessment Bureau.

[18]Only prosecutors and individuals the prosecutors choose to interview during the screening of cases are allowed in the Early Case Assessment Bureau.

[19]Each month a few Bureaus are assigned to cover the Early Case Assignment Bureau. The Bureaus on duty in a month will decide which specific days and shifts to assign their first-year prosecutors to.

[20]There are two shifts each day. Any cases sent to the Early Case Assessment Bureau after the end of the second shift (11 pm) will be assigned to the next day's morning shift based on their time stamp.

items into a bin on her desk.[21] The misdemeanor prosecutors will then take the top one or two cases to work on. Prosecutors are not allowed to read a case in the pile and then choose not to work on that case. The administrator also monitors the selection of cases from the pile to ensure that no prosecutor gets an unfair caseload by reading a challenging case and then deciding not to work on it.[22] This assignment procedure means prosecutor and defendant pairing is as good as random within each screening day. For 60 percent of cases, the prosecutor assigned to a case at the Early Case Assessment Bureau is responsible for the case from assignment at screening until disposition. Some cases are reassigned to another prosecutor after arraignment and I observe both prosecutors. For the remainder of the paper, I refer to the first prosecutor on the case as the prosecutor.

After a case is assigned to a prosecutor at Early Case Assessment Bureau, the prosecutor has multiple opportunities to alter case outcomes. Specifically, the prosecutor can decide to decline to prosecute the case, which charges to bring against a defendant, to endorse pretrial detainment, to pursue a case dismissal through adjournment in contemplation of dismissal, to offer a plea deal, and the components of a plea deal. All these decisions may alter a defendant's most crucial case outcome: guilty or not guilty.

The first decision a prosecutor makes is whether to decline to prosecute a case.[23] This outcome is rare because most cases are only declined if the case has a complete lack of evidence or the defendant was arrested for a crime that the District Attorney's office has decided not to prosecute anymore.

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[21]The time stamp on the case is very important. During my visit, multiple prosecutors and administrators mentioned the importance of handling cases in the order in which they came in. An administrator works 24 hours a day to handle arrests that come in outside of typical work hours, ensuring that the time stamps are correct.

[22]This assignment procedure was described to me by the Early Case Assessment supervisor and I witnessed the assignment of cases to prosecutors when I visited the Early Case Assessment Bureau. This random assignment is also confirmed by the researchers Kutateladze and Andiloro who originally collected these data, although they do not consider the effects of opposite-race prosecutors nor do they solely examine cases with random assignment (Kutateladze and Andiloro, 2014).

[23]In other counties and states it is very common for prosecutors to decline to prosecute cases. Kutateladze and Andiloro (2014) explains that the low decline rate in New York County is due to a close relationship between the New York County's District Attorney's Office and the New York City Police Department.

Next, the prosecutor decides which charges to bring against a defendant at screening. Often this includes the option of increasing or decreasing the severity of charges assigned to a defendant's case.[24] For example, a defendant may be booked for a Class B misdemeanor crime, punishable by up to 90 days in jail, but a prosecutor may increase her crime to a Class A misdemeanor, punishable by up to 1 year in jail, at screening (New York State, 2018). The severity of charges is critical because prosecutors often choose to follow, although they are not required to, department norms for pretrial detainment, plea deals, and sentencing based on charge severity (Frederick and Stemen, 2012).

The prosecutor also has the option of offering and designing a plea deal for all defendants. A plea deal can include charges that are higher or lower than the initial charges for which a defendant is booked. During plea bargaining, a prosecutor can also recommend a particular sentence to the judge. While a judge must approve of any plea or sentence, prosecutors play a significant role in designing the attributes of the plea deal and sentencing request. If a defendant accepts a plea deal, they will be considered guilty.

Instead of a plea deal, the prosecutor can also offer the defendant a particular type of dismissal, referred to as an adjournment in contemplation of dismissal.[25] This acts as an agreement to dismiss a case in 6 to 12 months if there are no subsequent arrests. In New York, an adjournment in contemplation of dismissal is not a conviction or an admission of guilt.[26] Like a plea deal, an adjournment in contemplation of dismissal must be approved by a judge, but an adjournment in contemplation of dismissal cannot be offered without the

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[24]Prosecutors in Manhattan are specifically trained to be very careful in assigning screening charges. For example, prosecutors are told not to merely re-record the arresting charges because the police officer may not be aware of the criminal history of a defendant or the details of the characteristics of a specific charge.

[25]An adjournment in contemplation of dismissal should be thought of as a not guilty verdict. During 2010 and 2011 in New York County, 36,411 court events had an adjournment in contemplation of dismissal outcome. Of these events, only 1 percent (384) had a later re-calendaring. A re-calendaring implies that the case could have been reopened, but not that the defendant was tried again and found guilty.

[26]New York Criminal Procedure §170.55

approval of the prosecutor.[27]

Finally, a case can be disposed through a dismissal.[28] A dismissal can be the result of a motion brought by a judge, defendant, or prosecutor. Misdemeanor cases can also be dropped unilaterally by a prosecutor (Kutateladze and Andiloro, 2014). For dismissals, charges against the defendant are immediately dropped. The most common reason for a dismissal in New York County is lack of speedy prosecution.[29] A prosecutor's decision to prioritize certain cases could allow them to influence which cases are dismissed. Specifically, a prosecutor could choose to work on particular cases first, knowing non-prioritized cases are more likely to be dismissed if the evidence is not gathered in time.

2.2 Data

I use data from the New York County District Attorney's Office, a large prosecutor's office responsible for prosecuting all crimes in the Manhattan borough of New York City. The dataset was compiled by the Vera Institute and is housed by the National Archive of Criminal Justice Data (Kutateladze et al., 2012).

I use the New York County District Attorney's Office's detailed administrative data on all misdemeanor cases assigned through Early Case Assessment in 2010-2011 for New York County. I focus my analysis on black defendants, black prosecutors, white defendants, and white prosecutors, the vast majority of my sample.[30] All data are collected at the case-level.

Data from the New York County District Attorney's Office include the race of the defen-

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[27]There are also special marijuana adjournment in contemplation of dismissals that can be offered without the approval of the prosecutor. These can only be offered in marijuana drug cases.

[28]Cases may also be disposed through a trial. However, in my sample, which is primarily misdemeanors, only 0.01% of cases go to trial. Therefore, I do not separately investigate the probability of guilt through a trial or an acquittal. Cases with these outcomes are included in my measure of guilty or not.

[29]Thirty-four percent (6,080 cases) of dismissals are due to lack of speedy prosecution.

[30] The third largest demographic group is Hispanics. Hispanic prosecutors only make up 4 percent of prosecutors at the New York County District Attorney's Office, making subgroup analysis difficult.

dant and prosecutor as well as other characteristics about the case, defendant, and prosecutor. For each case in the dataset, I observe arrest, screening and sentencing charges, type of crime, prior arrest history, prior conviction history, prior incarceration history, gender, and age for the defendant. I also have information on the gender and race of the prosecutor as reported by the New York County District Attorney's Office. Finally, I observe the disposition of every case that originated at the Early Case Assessment Bureau. Potential dispositions include conviction through trial, acquittal through trial, plea deal, decline to prosecute, dismissal, and dismissal through adjournment in contemplation of dismissal. Importantly, I also observe the screening date for each case. Because as good as random variation in prosecutor race only requires I condition on the screening date of a case, I demonstrate in Section 4.1 that prosecutor race is uncorrelated with other case and defendant characteristics.

Race of the defendant is defined by the police officers and obtained from the New York Police Department's arrest report. Defendant race is therefore based on the arresting officer's perception of race, and the race recorded by the arresting officer will follow the defendant from arrest until disposition. Black defendants make up 79 percent (68,798 cases) of my sample. Prosecutor race is reported by the New York County District Attorney's Office. Black prosecutors handle 14 percent of cases in my sample (11,937 cases).[31] Unfortunately, information on defendant and prosecutor race is missing for 1.63 percent and 1.82 percent of cases, respectively.[32] I also do not observe defendant date of birth for 17 cases and gender for 170 cases. For the remaining analysis, I only show results for the sample of cases where I observe all case and defendant characteristics.[33] Although these missing characteristics are

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[31] There are 2,488 (3 percent) cases with white defendants and black prosecutors, 9,449 (11 percent) cases with black prosecutors and black defendants, 59,349 (68 percent) cases with white prosecutors and black defendants and 16,175 (18 percent) cases with white prosecutors and white defendants.

[32] Table A1

[33] Summary statistics for the entire sample are found in Table A1. There are no meaningful differences between this sample and the one I use for the rest of the paper.

likely the result of clerical mistakes and are not related to the race of the defendant, prosecutor or case outcomes, I address this minor limitation in Section 4.4. Here I demonstrate that my results are robust to the inclusion of cases with missing characteristics and numerous assumptions about the value of missing characteristics.

My primary outcome of interest is an indicator for whether the defendant was found guilty at the case-level.[34] Importantly, this includes all cases, even the ones dismissed. A defendant can be found guilty one of two ways: by accepting a plea offer, or by conviction through a trial. A defendant is considered not guilty if her case is declined, dismissed or if her trial ends in an acquittal. As mentioned before, the vast majority (99.9%) of guilty outcomes come from plea deals.[35]

I also consider other decisions influenced by prosecutors that may alter a defendant's final case outcome (guilty or not guilty). These outcomes include declined prosecution, case dismissal, dismissal through adjournment in contemplation of dismissal, charge increases, and pretrial detention. Declined prosecution is one if the case is declined and zero for all other case outcomes. Case dismissal takes on a value of one if a case is dismissed by a judge or prosecutor, and zero otherwise. Adjournment in contemplation of dismissal takes on a value of one if a defendant's case is dismissed through this process, and zero for all other case dispositions. Charge increases takes on a value of one if case charges are increased to a higher severity at any point before disposition. Finally, pretrial detention takes on value of one if a defendant is detained after arraignment and zero otherwise.

Crime type is defined by the researchers who originally collected the data according to

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[34]In this dataset, all observations are at the case-level. This means a defendant is considered guilty if they convicted of any charge on the case.

[35]Two-hundred and twenty-one cases go to trial and 127 trial cases end in a conviction.

New York law.[36] The three most common types are drug crimes, property crimes, and person crimes. All other crimes are classified as other.[37] Although I do not observe the specific crime type associated with a case, the most common drug misdemeanor in New York County is possession of marijuana (Kutateladze and Andiloro, 2014). Most property misdemeanors are petit larceny (theft of property worth less than $1,000) and the most common person crime is assault in the third degree (Kutateladze and Andiloro, 2014; Chauhan et al., 2014). Drug crimes account for 25 percent of all cases, property crimes 38 percent, person crimes 7 percent and other crimes 31 percent. I am missing crime type for 1.53 percent of cases. I also address this minor issue in Section 4.4.

Table 1 displays summary statistics. I have a total of 87,461 cases. Approximately 27 percent of defendants have previously been incarcerated. On average, 20 percent of cases are dismissed, 20 percent are dismissed through adjournment in contemplation of dismissal (ACD), and 58 percent end with a guilty verdict.[38] As my cases are primarily misdemeanors, 99.9 percent of convictions come from plea deals. The majority, 82 percent, of defendants are male and the average age is 34 years. Across all cases, 41 percent of prosecutors are male.

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[36]Kutateladze et al. (2012) defines crime types using the New York Penal Law: person offenses – New York Penal Law §120.00 – 135.75; property offenses - §140.00 – 165.74; and drug offenses - §220.00 – 221.55.

[37]Unfortunately, I do not observe the specific crimes that fall into the other category. I do know the most common crime types in the "other" category are escape and other relating to custody (PL §205), firearms, and other dangerous weapons (PL §265) and offenses against public order (PL §240).

[38]Adjournment in Contemplation of Dismissal includes Marijuana Adjournment in Contemplation of Dismissals.

3   Model

I use a generalized difference-in-differences model to estimate the effect of being assigned an opposite-race prosecutor. Formally, I estimate the following:

$$Guilty_c = \beta_0 + \beta_1 I(BlackDefendant)_c + \beta_2 I(WhiteProsecutor)_c+$$

$$\beta_3 I(BlackDefendant * WhiteProsecutor)_c + X_c + ScreeningDate_c + \epsilon_c \quad (1)$$

Guilty is a binary variable equal to one when the defendant is found guilty for case c and zero for all other case dispositions. *Black Defendant* takes on a value of one when the defendant is black and zero when the defendant is white. β_1 captures differences in the probability of guilt across defendant race. *Black Prosecutor* is equal to one when the prosecutor is black and zero when the prosecutor is white, and controls for differences in probability of guilt across prosecutor race. The coefficient of interest, β_3, on *BlackDefendant * WhiteProsecutor* captures the effect of being assigned an opposite-race prosecutor. X_c includes control variables at the case-level. Specifically, X_c includes defendant race, age, date of birth, gender, number of arrest charges, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, drug crime, property crime, person crime, arrest Zipcode and prosecutor gender. All specifications include *ScreeningDate* fixed effects. Robust standard errors are clustered at the prosecutor level to allow observations to be correlated across cases for a particular prosecutor. As I will present results for multiple subgroups of crime, I also correct standard errors for multiple comparisons as suggested by Anderson (2008).

Intuitively, the difference-in-differences compares differences in the probability of guilt between black defendants and white defendants for black prosecutors and white prosecutors. This model allows for black defendants to be more or less likely to be found guilty than white defendants. Similarly, black prosecutors may have different propensities for earning convictions than white prosecutors.

The identifying assumption of this model is that the differences in probability of guilt between black and white defendants across white and black prosecutors would be the same in the absence of opposite-race bias. Identification relies on the random assignment of cases to prosecutors. The identifying assumption could fail if prosecutor race is correlated with other factors that also alter the probability of conviction. For instance, in other settings, black prosecutors may choose to prosecute cases for white defendants only when they believe they have a strong case ensuring a guilty verdict, and accept any case with a black defendant. In this case, I would conclude my treatment effect was due to opposite-race bias, when it could actually be attributed, in part, to the initial quality of the case. I avoid this problem by using the random assignment of prosecutors to cases conditional on screening date. I can illustrate empirically that prosecutor race is uncorrelated with all observed defendant and case characteristics that would alter conviction rates.

The identifying assumption could also fail if prosecutors are responding to characteristics about a case that are correlated with defendant race. For example, if black prosecutors always earn more guilty verdicts for drug crimes and white defendants are more likely to commit drug crimes, I would find evidence of opposite-race bias. To address this potential failure, I interact all case and defendant characteristics with prosecutor race. If the inclusion of these interactions altered my estimate of opposite-race bias, then I could conclude the treatment

effect could, in part, be attributed to prosecutors' responses to observed characteristics correlated with defendant race, but not necessarily defendant race itself. For example, if white defendants are more likely to commit drug crimes and black prosecutors always earn more guilty verdicts for drug crimes, some of the opposite-race treatment effect I estimate could be due to black prosecutors' differential treatment of drug crimes, but not defendant race.

In Equation (1), β_3 captures the average opposite-race bias of prosecutors. I will also consider the opposite-race bias of specific prosecutors separately because the average estimate may mask important heterogeneities. To do so, I must consider two different models; one for white prosecutors and one for black prosecutors. Precisely, to estimate heterogeneous treatment effects for white prosecutors, I consider the following equation:

$$Guilty_c = \beta_0 + \beta_1 I(BlackDefendant)_c + ProsecutorID_p +$$

$$\Sigma_{p=1}^{127} \beta_{3p} I(BlackDefendant * WhiteProsecutor)_c * I(Prosecutor)_p + X_c + ScreeningDate_c + \epsilon_c$$

$$(2)$$

Here I build on the original specification in Equation (1) by estimating prosecutor-specific fixed effects and interaction terms.[39] For a particular white prosecutor, the difference-in differences compares differences in the probability of guilt between black defendants and white defendants for average black prosecutors and a specific white prosecutor. Here β_{3p} captures the effect of being assigned a white prosecutor p. I use a similar specification for

[39]Note that prosecutor-specific fixed effects subsume a prosecutor race fixed effect.

black prosecutors:

$$Guilty_c = \beta_0 + \beta_1 I(WhiteDefendant)_c + Prosecutor_p +$$

$$\Sigma_{p=1}^{127} \beta_{3p} I(WhiteDefendant * BlackProsecutor)_c * I(Prosecutor)_p + X_c + ScreeningDate_c + \epsilon_c$$

$$(3)$$

In this case β_{3p}, compares differences in the probability of guilt between black defendants and white defendants for average white prosecutors and a particular black prosecutor.

4   Results

4.1   Exogeneity of Prosecutor Race

I start by showing prosecutor race is not correlated with confounding factors. While I expect this to be true based on the case assignment process at the New York County District Attorney's Office, I also provide empirical evidence. To begin, I regress defendant and case characteristics (determined before the case is assigned to a prosecutor) on prosecutor race. Each specification includes screening date fixed effects. Precisely, I examine if defendant race, age, date of birth, gender, any prior arrests, number of prior arrests, any prior convictions, number of prior convictions, any prior incarceration, and number of prior incarcerations are correlated with the race of the prosecutor. I also examine whether the number of current arrest charges, number of current arrest counts, misdemeanor type, type of crime—drug, property, person, other—of the case are correlated with prosecutor race.

Results are reported in Table 2. Of the nineteen coefficients presented, only one is statistically significant at conventional levels. This is consistent with the number of findings

due to chance. Additionally, the coefficients are also close to zero. For example, compared to white prosecutors, black prosecutors are 0.6 percentage points more likely to be on cases with a black defendant. I conclude defendant and case characteristics are not correlated with prosecutor race. These results indicate that case and defendant characteristics are orthogonal to prosecutor race and is consistent with the institutional story that cases are as good as-randomly assigned to prosecutors.

I also include another test to demonstrate that race is not correlated with confounding factors. The intuition behind this test is to show that the underlying probability of guilt for a defendant, determined before a case is assigned to a prosecutor, is unrelated with the race of her prosecutor. To do so, I predict the probability of guilt for each defendant using all observable characteristics about the defendant and case except for the race of the prosecutor. Specifically, I predict *Guilty* (after removing screening date fixed effects) using defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. Next, I compare the predicted probability of guilt for black and white defendants across white and black prosecutors. If the predicted values are the same for black and white defendants regardless of prosecutor race, then I provide further evidence that the underlying probability of guilty for defendants is not correlated with prosecutor race.

Results for the predicted values test are shown in Figure 1 for the full sample. The predicted probability of guilt is 50.7 percent for white defendants assigned to white prosecutors and 51.1 percent for white defendants assigned to black prosecutors. These predicted values

are not statistically different from each other (p-value=0.552).[40] Similarly, the predicted probability of guilt for black defendants assigned to white prosecutors and black prosecutors are not statistically different (59.1 percent and 59.9 percent, respectively, p-value = 0.211). Figure 1 is also replicated for only property crimes in Figure 2. Again, predicted values are similar for white and black defendants no matter the race of the prosecutor (p-values = 0.753 and 0.219, respectively). This further suggests prosecutor race is unrelated to a defendant's pre-determined likelihood of guilt and that my identifying assumption holds.

4.2   Effect of Opposite-Race Prosecutors on Defendant Guilt

Next, I present results for my entire sample of cases in Table 3. Each Column includes screening date fixed effects along with standard errors clustered at the prosecutor level. The outcome variable for each Column is the probability of guilt. *Guilty* takes on a value of one if the defendant is convicted of a crime in any manner and zero for all other case outcomes.

Column 1 presents the estimate for opposite-race prosecutors for all case types. The coefficient on $BlackDefendant * WhiteProsecutor$ is 0.0252 and is statistically significant at the 5 percent level. This shows that being assigned an opposite-race prosecutor increases conviction by 2.52 percentage points (4 percent).

Column 2 adds controls for defendant and case characteristics, such as the criminal history of the defendant and indicators for the type of crime committed. Specifically, Column 2 adds controls for defendant age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, drug crime, property crime, person crime, arrest Zipcode, and the gender of the prosecu-

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[40]Formally, I regress predicted probability of guilt for white defendants on an indicator for prosecutor race.

tor. Consistent with my identifying assumption, the coefficient remains similar in magnitude (0.0122), although not significant at conventional levels.

Along with case-level controls, Column 3 adds prosecutor fixed effects, which account for unobserved time-invariant prosecutor characteristics. Again, consistent with the identifying assumption, the coefficient of interest remains similar in magnitude—slightly decreasing to 0.0115—although not significant at conventional levels.

Column 4 explores another potential threat to identification. If prosecutors are responding to case characteristics that are correlated with defendant race, but not defendant race itself, then I could incorrectly categorize different treatment of case characteristics as opposite-race bias. For example, if black defendants are more likely to commit drug crimes and white prosecutors are more likely to win guilty verdicts for drug crimes, then I would incorrectly attribute differences in prosecuting drug crimes to opposite-race bias. To directly investigate this threat, I add a separate interaction for each case characteristic and defendant control added in Column 2 interacted with prosecutor race; this allows black and white prosecutors to respond differently to case characteristics. The coefficient of interest remains about the same with the inclusion of interactions, slightly increasing from Column 3 to 0.0241, and is significant at the five percent level. Taken together these Columns suggest that opposite-race prosecutors increase the probability of conviction by 1-2.5 percentage points (2-4 percent).

Next, I explore effects by crime type, as prosecutors are often trained to handle each type of case uniquely. Many district attorneys' offices have office norms for how actively to pursue or which type of sentences to assign for certain types of crimes (Frederick and Stemen, 2012). Different types of crimes are also often handled uniquely based on their quality of evidence (Frederick and Stemen, 2012). Further, earlier research suggests that racial disparities may

differ by crime type (e.g. Albonetti, 1997; Mustard, 2000; Steffenmeier et al., 2006).In particular, I consider effects for drug, property, person, and other crimes in Table 4.

In Table 4, each panel represents a different type of crime. The Column layout of Table 4 is similar to Table 3. For each crime type, I first present results for the specification with screening date effects only. The second Column adds controls, the third Column adds prosecutor fixed effects, and the fourth Column adds interactions.

I find little evidence of opposite-race bias for drug, person, or other offenses, as shown in Panels A, B, and C. Results in Panel D present robust and significant opposite-race effects for property crimes. The estimate of 0.0549 indicates that being assigned an opposite-race prosecutor increases the likelihood of a guilty verdict by 5.5 percentage points (9 percent) for property crimes. The estimate of opposite-race bias for property crimes remains about the same magnitude, and statistically significant at the one percent level for all four specifications. These results indicate that opposite-race prosecutors increase the probability of a guilty verdict by 4-6 percentage points (6-9 percent).

Because I report results for multiple types of crimes, I also include False Discovery Rate (FDR) adjusted q-values for the estimates presented in Table 4. I compute the FDR-q values using the method proposed by Anderson (2008), adjusting for four different crime categories. The FDR-q values can be interpreted as adjusted p-values. The FDR q-values for the property crime estimates in Panel D are statistically significant at the five percent level or less for each specification. Therefore, I conclude that the effects I find are large enough not to be attributed to chance. In combination, these results show strong opposite-race bias for property crimes only.

4.3 Heterogeneous Effects by Prosecutor

To this point, I have only established average prosecutor opposite-race bias. As I have many prosecutors in my sample, it is natural to wonder if particular prosecutors drive my results. Therefore, next, I analyze my data at the prosecutor level. For each prosecutor, I estimate a separate opposite-race bias term. To do so, I plot the coefficient β_{3p}, the prosecutor-specific opposite-race bias term, from Equation (2) for white prosecutors and Equation (3) for black prosecutors. I present results for all crimes in Figure 3 and Property Crimes in Figure 4. I restrict my analysis to only include prosecutors with more than 100 cases (127 unique prosecutors).[41]

There are two important features of this analysis. First, there is substantial heterogeneity in the direction and magnitude of prosecutor racial bias. Opposite-race bias estimates range from -0.26 to 0.26 for all crimes and -0.20 to 0.20 for Property Crimes. These estimates are more than at least six times the average estimates I find in Column 2 of Table 3 and Table 4. Finally, I do not find evidence that the distribution of opposite-race bias estimates are different for black and white prosecutors for all crimes ($\chi^2 = 127$, $p - value = 0.458$) or Property Crimes ($\chi^2 = 85$, $p - value = 0.449$).

Second, a substantial proportion of prosecutors have opposite-race bias terms greater than zero. In particular, 61% of prosecutors have a coefficient greater than zero in the entire sample. The same is true of 67% of prosecutors for Property Crimes. Further 44% and 46% of the opposite-race bias estimates are positive and statistically different from zero at the 95% level for the entire sample and Property Crimes, respectively. These results suggest that prosecutor opposite-race bias is not driven by a few "bad apples" or extreme prosecutors,

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[41]After dropping prosecutors with less than 100 cases, I retain 91% of my original sample of cases for all crimes and 84% of my sample for Property Crimes.

but rather the majority of prosecutors could be responsible for some opposite-race bias.

Now, I return to my original analysis of average opposite-race bias to consider how removing prosecutors with the greatest opposite-race bias coefficients could alter my average estimate of opposite-race bias. To investigate this, I re-estimate Equation (1) multiple times, iteratively dropping prosecutors by the size of their opposite-race bias coefficient estimated from Equations (2) and (3). Specifically, I rank prosecutors in order of their opposite-race bias coefficient show in Figures 3 and 4. Next, I drop the highest rank prosecutor, then the second and highest ranked, then the three highest ranked prosecutors and so on. The average opposite-race bias terms, β_3, from Equation (1) for this procedure are presented in Figures 5 and 6 for all crimes and Property Crimes, respectively. For all crimes, after dropping the 18 highest ranked prosecutors, the top 14% of my sample, the estimate of opposite-race bias is less than zero.[42] For Property Crimes, after dropping the 18th highest ranked prosecutors, the top 21% of my sample, the estimate of opposite-race bias is less than zero.[43] These results suggest that targeted attempts to remedy opposite-race bias would likely need to focus on the worst 14-21% of prosecutors.

4.4   Missing Values

As mentioned previously, defendant age, defendant gender, defendant race, crime type, and prosecutor race are missing for some observations in my sample. In this section, I will demonstrate that these minor data limitations do not alter the results of this paper.

First, I show that including cases with missing information on defendant age, and gender does not change my estimates for property crimes. Defendant age and gender are missing

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[42]Here "my sample" refers to prosecutors with more than 100 cases (127 prosecutors).
[43]"My sample" is prosecutors with more than 100 property crime cases (85 prosecutors).

for 0.02 percent and 0.2 percent of cases, respectively (17 and 170 cases). Results are shown in Table A3. Each specification in the table includes screening date fixed effects, case-level controls, and interactions, just as in Column 4 of earlier result tables. Column 1 repeats the result for property crimes in Table 4 for comparison. In Column 2, I include dummy variables for missing defendant age and missing defendant gender and interact each of these dummies with prosecutor race. I also replace the values of defendant gender and defendant age with zeros for observations where I do not observe true gender or age. My coefficient on $Black\ Defendant * White\ Prosecutor$ is almost identical in magnitude and is significant at the one percent level. This indicates that missing information for defendant age and gender does not alter my results.

Next, I consider missing crime type. In Column 3, I assume all cases missing crime type are property crimes. In Column 4, I randomly assign case type based on the probability of property crime in my data (38 percent of cases are property crimes). Then I estimate my result using screening date fixed effects, case-level controls, and interactions. I then repeat this exercise 10,000 times. I present the average coefficient for these iterations and the 95 percent confidence interval. In both columns, my estimate is similar in magnitude. I am also able to rule out zero in my confidence interval.

Second, I consider missing values of defendant and prosecutor race. Defendant race is missing for 1.6 percent of the sample (887 defendants) and prosecutor race is missing for 1.8 percent of the sample (3 prosecutors and 780 cases). Next, I show my results are robust to various assumptions about missing prosecutor and defendant race. First, I address missing values for prosecutors. Because 777 (99 percent) of the cases with missing values have the same prosecutor, I simply replace prosecutor race with either white or black. In Column

5, I replace missing prosecutor race as white and re-estimate my results. In Column 6, I replace missing prosecutor race as black. Both estimates (0.0498 and 0.0479, respectively) are very similar in magnitude to the original estimate and are statistically significant at the one percent level.

In Columns 7-12, I make reasonable replacements for defendant race. In Columns 7 and 8, I replace all missing defendant races as black and white, respectively. Next, I replace defendant race as 0.5 black and 0.79 black, the sample average, in Columns 9 and 10. These results are, again, very similar in magnitude to my original estimate and statistically significant at the one percent level.

Of course, there are many different combinations of defendant race that could occur beyond the results presented so far in Table A3. To address these possible scenarios, I conduct a simulation where I randomly replace defendant race based on the distribution of defendant race I observe in my data (79 percent of defendants are black). Specifically, I randomly assign defendant race, estimate my result using arrest category and prior arrest fixed effects, case-level controls, and interactions. I then repeat this exercise 10,000 times. I present the average coefficient for these iterations and 95 percent confidence intervals in Columns 11 and 12. I also assume all missing prosecutors are white in Column 11, and black in Columns 12. The average coefficient for both Columns (0.0481 and 0.0442) is close to the original estimate and both confidence intervals do not include zero. These results show that under most assumptions about which cases have opposite-race pairings of prosecutors and defendants, results still show strong evidence of opposite-race bias for property crimes.

4.5   Potential Mechanism

Given my results show strong evidence of opposite-race bias in the probability of guilt for property crimes, it is natural to wonder how a prosecutor may alter the outcome of a case. In this section, I investigate potential mechanisms through which a prosecutor could affect the disposition of a case. As mentioned previously, there are many ways a prosecutor can alter the final outcome of a case: guilty or not guilty. To examine the effect of opposite-prosecutors on potential mechanisms, I estimate equation (1) using declined prosecution, pretrial detainment, case dismissal, increasing charges, and adjournment in contemplation of dismissal as outcome variables. Results for potential mechanisms are shown in Table 5.

Each specification in the table includes screening date fixed effects, case-level controls, and interactions, just as in Column 4 of Tables 3 and 4. First, I show results for declined prosecution in Column 1. It is possible that prosecutors could exhibit bias in the manner that they decline to prosecute cases. I find evidence of opposite-race bias in decline to prosecute for the entire evidence in Column 1. When a defendant is assigned an opposite-race prosecutor they are 34 percent less like to have their case declined. However, I find no evidence of this bias for property crimes.

I also consider pretrial detention because prosecutors often have the power to recommend pretrial detention for defendants. Existing literature documents that pretrial detention can lead to increases in conviction for defendants because they are more likely to accept a plea deal while detained pretrial (Dobbie et al., 2018; Heaton et al., 2017). However, I only find suggestive evidence of opposite-race bias in pretrial detention for both the entire sample and the subsample of property crimes. As both coefficients are positive, but statistically insignificant, these results suggest opposite-race prosecutors might increase pretrial detention.

Next, I consider case dismissal as a potential mechanism in Column 3. Some misdemeanor dismissals are determined unilaterally by the cases' prosecutor. Most dismissals are due to lack of speedy prosecution, which is officially determined by a judge, but a prosecutor's prioritization decisions can alter how long it takes to gather evidence on a case. For example, a prosecutor could decide to first work on cases where the defendant is their own-race versus opposite-race. For all cases and property crimes, an opposite-race prosecutor decreases the chance of a case dismissal, although neither coefficient is statistically significant at conventional levels. This indicates that prosecutors could be altering case outcomes through increased dismissals for opposite-race defendants.

Results for charge increases are shown in Column 4. A prosecutor's decision to increase the severity of charges may make it more difficult for a defendant to be released pretrial or may make the prosecutor more likely to seek out a guilty plea based on the new higher charges (Frederick and Stemen, 2012). For all cases and property crimes, an opposite-race prosecutor increases charge increases, although neither coefficient is statistically significant at conventional levels.

In Column 5, I present results for adjournment in contemplation of dismissal, the third most common case outcome (after a guilty plea and case dismissal). For the entire sample, the estimate of opposite-race bias is statistically insignificant, but its magnitude suggests that being assigned an opposite-race prosecutor decreases the likelihood of case dismissal through adjournment in contemplation of dismissal. Among defendants who have committed property crimes, being assigned an opposite-race prosecutor decreases the chance of dismissal through adjournment in contemplation of dismissal by 3.78 percentage points or 16 percent. These results suggest a substantial portion of the opposite-race bias I estimate could be

attributed to prosecutors not dismissing cases for defendants.

5 Discussion

These results show strong evidence of opposite-race bias for property crimes, although not other crime types. This raises questions as to why prosecutors exhibit bias for only one type of crime. Further, it is also natural to wonder if these results matter for overall racial disparities in the criminal justice system if bias is only demonstrated for one specific type of crime.

While I cannot definitively conclude why prosecutor bias exists for only property crimes, I believe it could be due to the typical strength of evidence for property versus other types of crimes. Prosecutors agree that the quality of evidence is important for deciding how to prosecute a case (Frederick and Stemen, 2012). Prosecutors also agree that most property crimes have less hard evidence than other types of crimes (Frederick and Stemen, 2012). For example, physical evidence is considered the most reliable type of evidence by prosecutors, and prosecutors agree that physical evidence in property cases is typically weaker than in drug cases (Frederick and Stemen, 2012). Person crimes are also more likely to involve a victim, compared to property crimes, creating greater pressure to resolve the case correctly and perhaps encouraging prosecutors to gather more evidence quickly. For example, 98 percent of prosecutors surveyed in Frederick and Stemen (2012) believe victim satisfaction is at least a moderately important outcome for a prosecutor to consider.

Therefore, prosecutors may be able to exercise bias in the decision to dismiss a case through adjournment in contemplation of dismissal, encourage dismissal, and increase charges, as property cases may have more room for discretion. Suppose that a defendant is arrested

for a property crime but the case lacks solid evidence, the prosecutor would have more leeway to choose to push for a dismissal or a plea deal, compared to a case where a person is arrested with drugs, as hard evidence, on them. In this context, at least, it seems prosecutors are more likely to fairly prosecute crimes when they lack room for discretion.

Although I only find strong results for property crimes, it is important to note that property cases are the most common type of case in New York County and property arrests are the most common arrest type in the United States (FBI: UCR, 2012). This indicates there are many cases with greater room for discretion. Further, the New York District Attorney's Office claims to be concerned with racial bias (Cyrus Vance For District Attorney, 2017; Manhattan District Attorney, 2018a), which could mean that in other jurisdictions with less focus on potential racial disparities and public scrutiny potential for prosecutor discretion is greater.

Regardless, the results I find in New York County have important implications for racial disparities in the criminal justice system. For property crimes in New York County, the likelihood of guilt for black and white defendants is 63 percent and 50 percent, respectively. This indicates a black-white disparity of 13 percentage points. Given this black-white disparity in guilt, opposite-race bias by prosecutors could account for about 30 percent $(\frac{Estimate\,of\,Opposite\,Race\,Bias * Pr(White\,Prosecutor)}{Black\,White\,Disparity} = \frac{0.047*0.86}{0.13})$ of the difference in guilt across race for property crimes.[44] Even if prosecutors are acting fairly in other types of cases, the magnitude of the opposite-race bias I estimate should warrant further investigation into

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[44]Here 0.86 is the probability of being assigned a white prosecutor for property crimes and 0.048 is my estimate of opposite-race bias for property crimes (Table 4). Referring to the model I present in equation (1), I estimate that the difference in conviction races between black and white defendants is $[(\beta_0 + \beta_1) * Pr(Black\,Prosecutor|Black\,Defendant) + (\beta_0 + \beta_1 + \beta_2 + \beta_3) * Pr(White\,Prosecutor|Black\,Defendant)] - [\beta_0 * Pr(Black\,Prosecutor|White\,Defendant) + (\beta_0 + \beta_2) * Pr(White\,Prosecutor|White\,Defendant)]$ Because cases are randomly assigned, $Pr(Black\,Prosecutor|White\,Defendant) = Pr(Black\,Prosecutor|Black\,Defendant)$ and similarly $Pr(White\,Prosecutor|White\,Defendant) = Pr(White\,Prosecutor|Black\,Defendant)$. Further, Pr(Black Prosecutor)=1-Pr(White Prosecutor). Using this information to simplify, I determine the difference in black and white conviction rates is $\beta_1 + Pr(White\,Prosecutor)\beta_3$ where β_3 is my estimate of opposite-race bias. Therefore $\frac{\beta_3*Pr(White\,Prosecutor)}{\beta_1+\beta_3*Pr(White\,Prosecutor)}$ represents the amount of the black-white gap explained by my estimate of opposite-race bias.

prosecutor bias.

6   Conclusion

In this paper, I test for opposite-race prosecutor bias in criminal convictions. To overcome potential endogenous case selection by prosecutors, I exploit the random assignment of cases to prosecutors in New York County to isolate as good as random variation in prosecutor race. This variation, in combination with variation in defendant race, allows me to estimate the extent to which prosecutors are biased against opposite-race defendants.

My results indicate that the assignment of an opposite-race prosecutor leads to a 5 percentage point (~ 8 percent) increase in the probability of being found guilty for property crimes only. In addition, I explore the potential mechanisms through which opposite-race bias affects the probability of guilt. I show that being assigned an opposite-race prosecutor decreases the likelihood that a case is dismissed through an adjournment in contemplation of dismissal. I interpret the reason for these findings as likely because prosecutors can more easily exercise discretion for crimes with weaker evidence, although I cannot rule out other interpretations.

My findings of opposite-race prosecutor effects support recent movements to increase the training of prosecutors and curb the ability of prosecutors to exercise discretion based on race (U.S. Department of Justice, 2016). Additionally, my results add to existing evidence documenting opposite-race bias. It is possible that a meaningful portion of the black-white disparity in convictions could be contributed to prosecutors exhibiting opposite-race bias even if prosecutors do not display bias on all cases.

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7 Tables and Figures

Figure 1: Predicted Values of Guilt
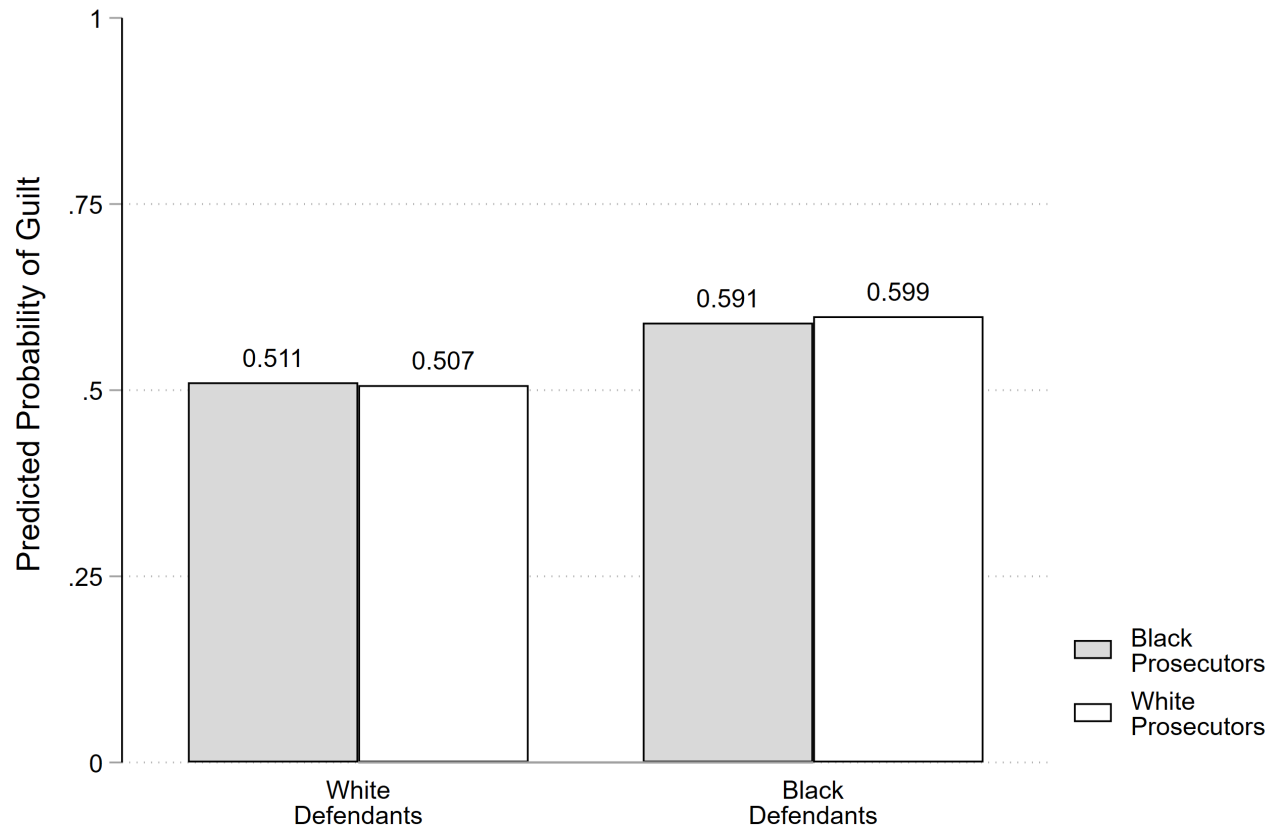
Notes: This figure reports predicted guilt for black and white defendants assigned to black and white prosecutors. The predicted value is calculated by regressing *Guilty* on all observable characteristics about the defendant and case determined before the case was assigned to the prosecutor except for prosecutor race. Specifically, *Guilty* is predicted (after removing screening date fixed effects) using defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for number of arrest charges, any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. There is no statistical difference in predicted guilt for white defendants assigned to white or black prosecutors. The same is true for black defendants.
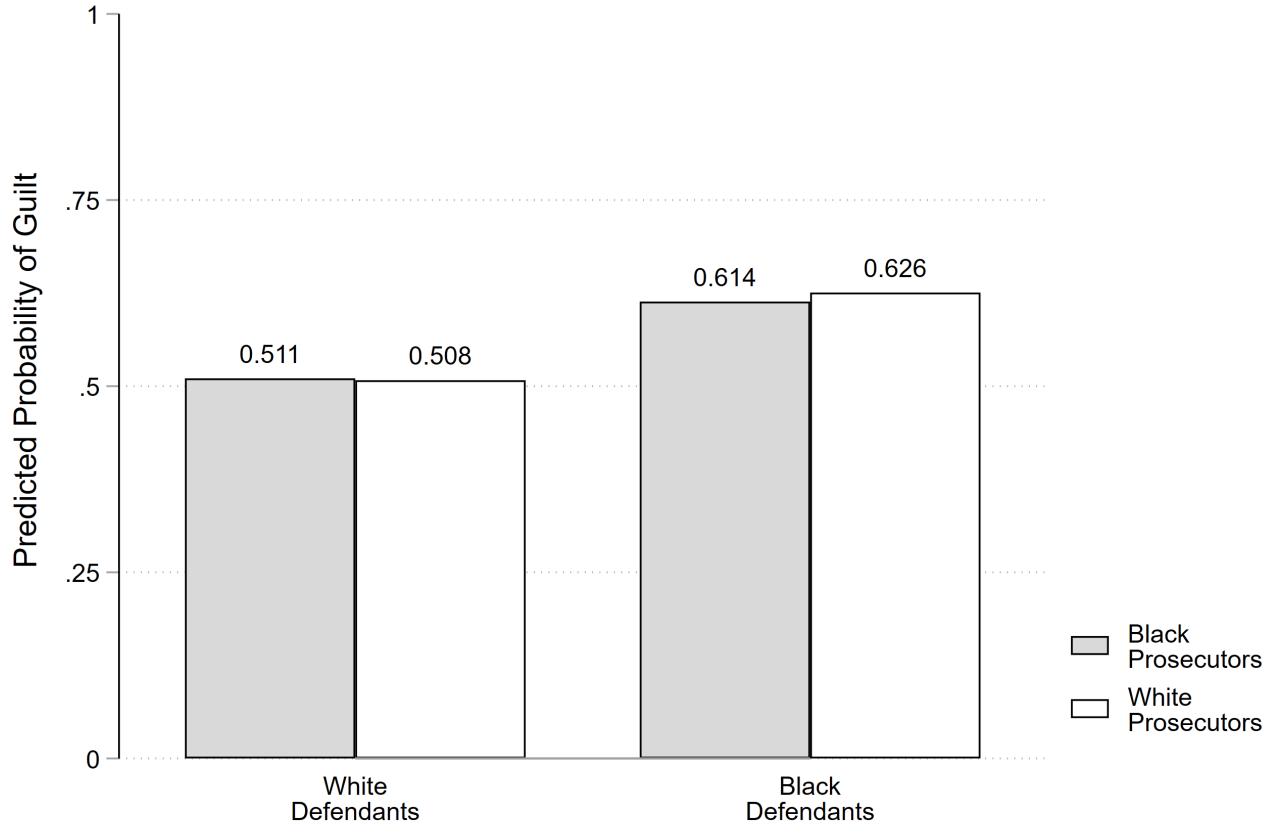
Figure 2: Predicted Values of Guilt for Property Crimes

Notes: This figure reports predicted guilt for black and white defendants assigned to black and white prosecutors. The predicted value is calculated by regressing *Guilty* on all observable characteristics about the defendant and case determined before the case was assigned to the prosecutor except for prosecutor race. Specifically, *Guilty* is predicted (after removing screening date fixed effects) using defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. There is no statistical difference in predicted guilt for white defendants assigned to white or black prosecutors. The same is true for black defendants.

Figure 3: Heterogeneous Treatment Effects by Prosecutor
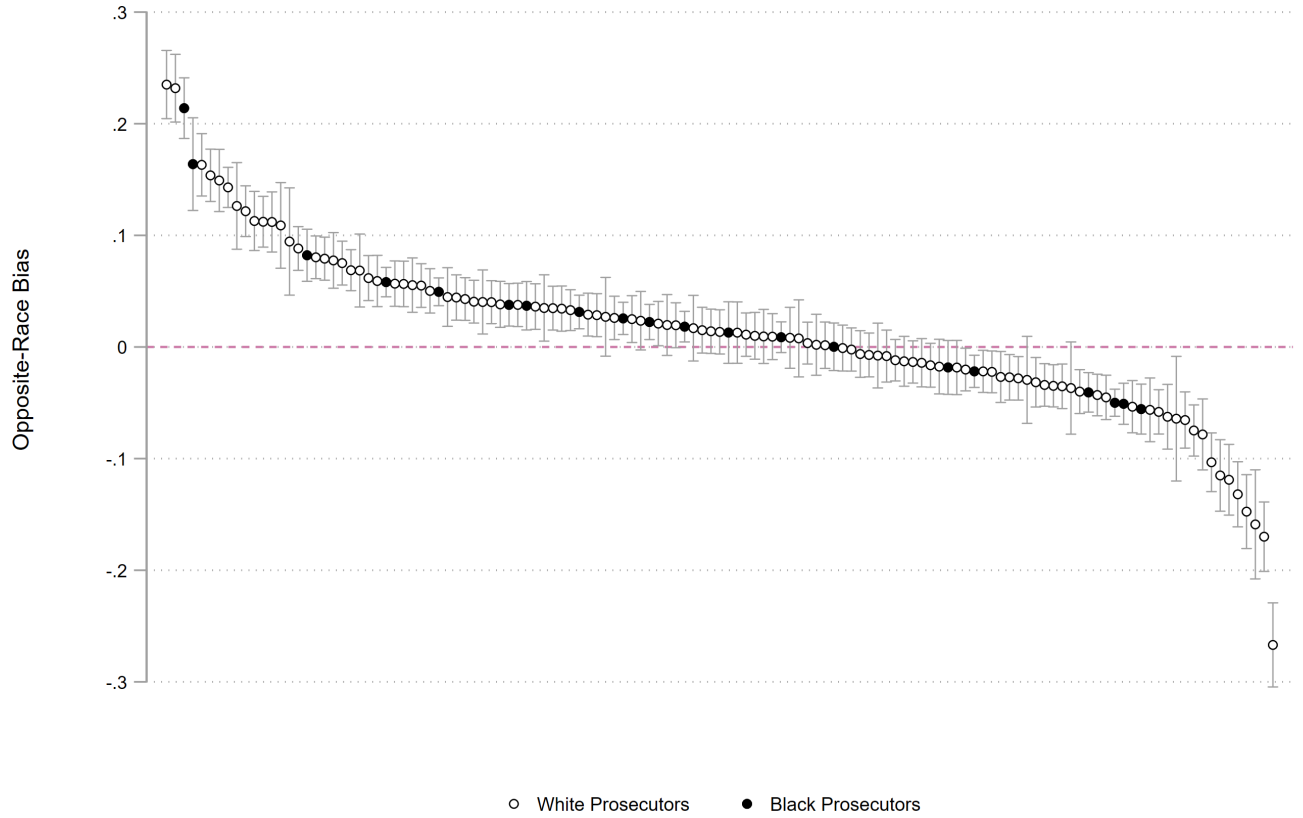
○ White Prosecutors   ● Black Prosecutors

Notes: Each point represents a prosecutor-specific estimate of opposite-race bias, i.e. the coefficient β_{3p} from Equation (2) or (3). β_{3p} can be thought of as the effect of a specific opposite-race prosecutor on a defendant guilt. For a specific white prosecutor, the difference-in differences compares differences in the probability of guilt between black defendants and white defendants for average black prosecutors and a particular white prosecutor. 95% confidence intervals are shown. I only include prosecutors with more than 100 cases.

Figure 4: Heterogeneous Treatment Effects by Prosecutor for Property Crimes
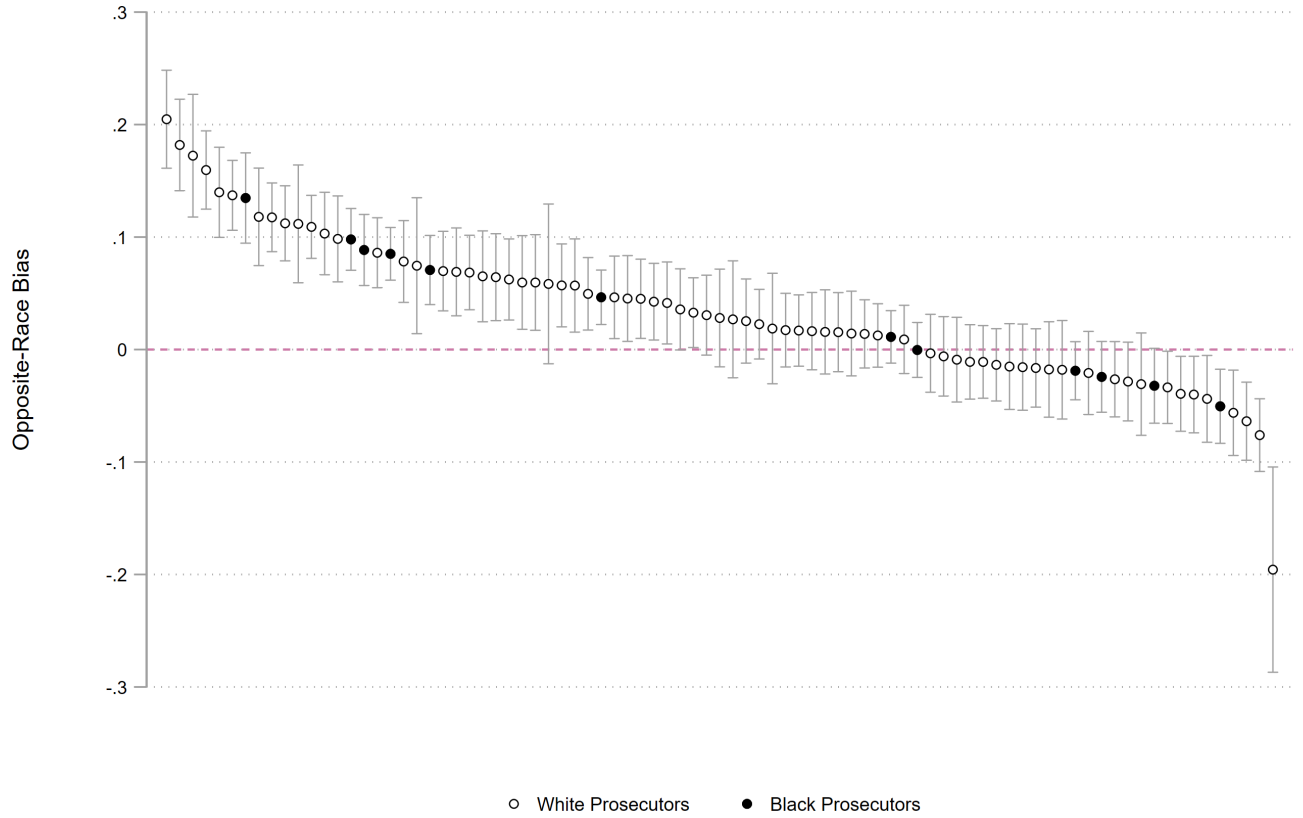
Notes: Each point represents a prosecutor-specific estimate of opposite-race bias, i.e. the coefficient β_{3p} from Equation (2) or (3). β_{3p} can be thought of as the effect of a specific opposite-race prosecutor on a defendant guilt. For a specific white prosecutor the difference-in differences compares differences in the probability of guilt between black defendants and white defendants for average black prosecutors and a particular white prosecutor. 95% confidence intervals are shown. I only include prosecutors with more than 100 property cases.

Figure 5: The Effect of Dropping Prosecutors on Opposite-Race Bias Estimates
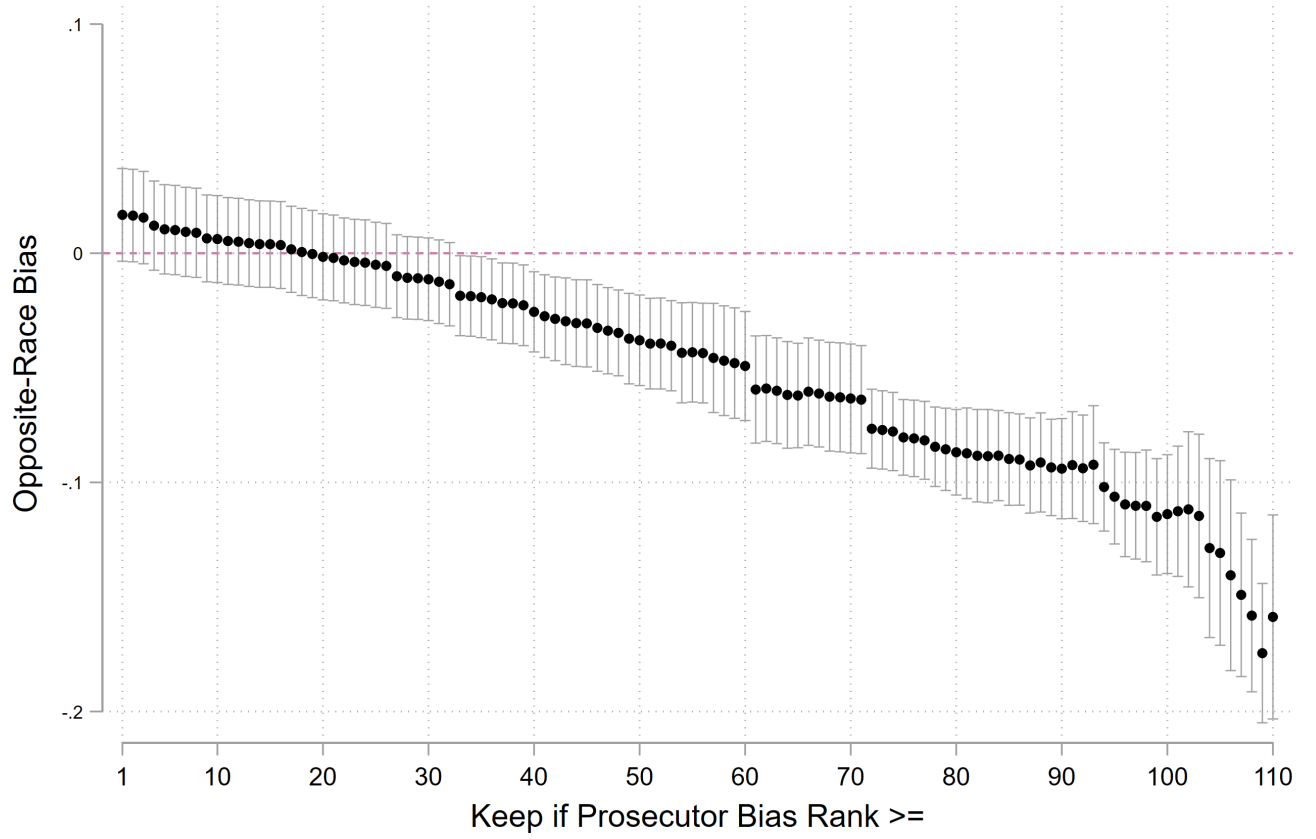
Notes: Each point represents the average estimate of opposite-race bias, i.e. the coefficient β_3 from Equation (1). Each coefficient is estimated from a separate regression. 95% confidence intervals are shown.

Figure 6: The Effect of Dropping Prosecutors on Opposite-Race Bias Estimates
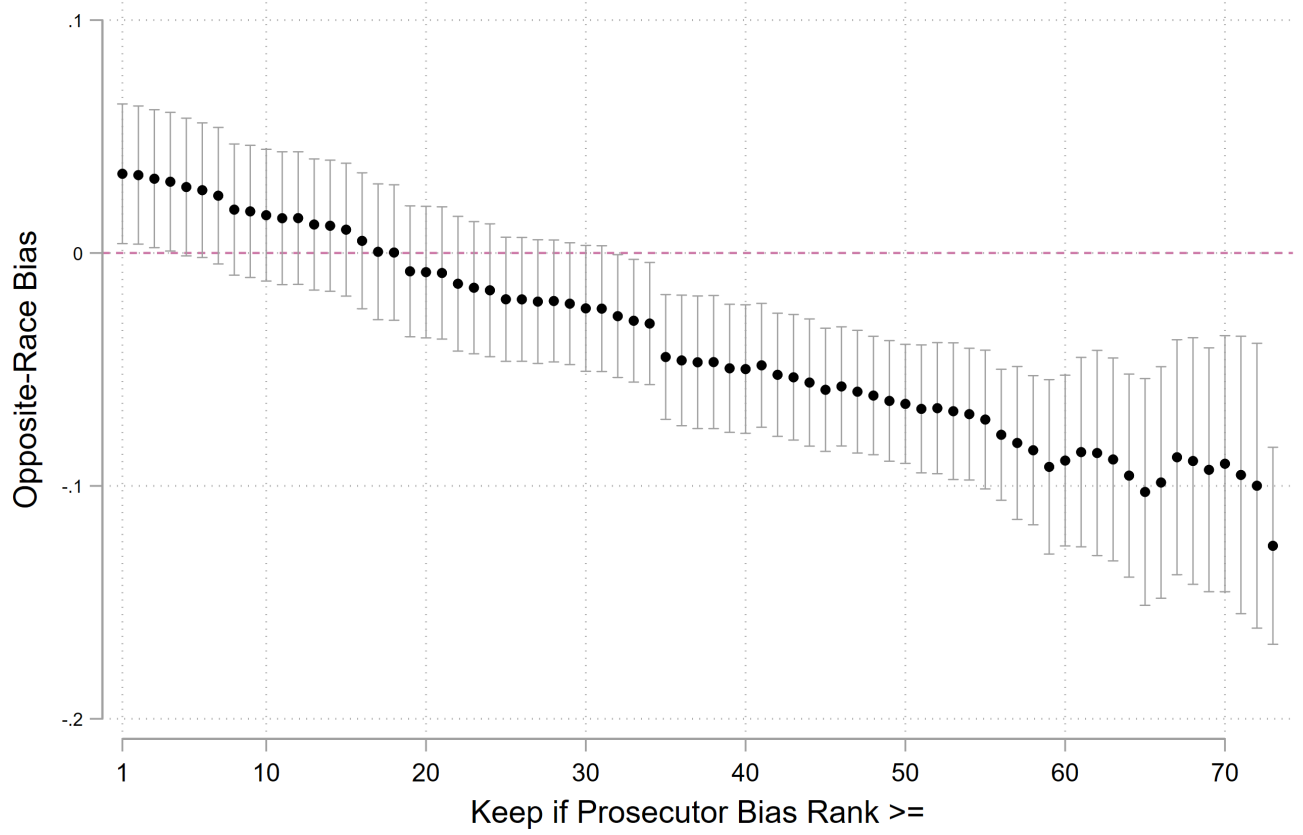
Notes: Each point represents the average estimate of opposite-race bias, i.e. the coefficient β_3 from Equation (1). Each coefficient is estimated from a separate regression. 95% confidence intervals are shown.

Table 1: Summary Statistics – Sample Used

	(1) All	(2) Black Defendants	(3) White Defendants	(4) Drug Crimes	(5) Property Crimes	(6) Person Crimes	(7) Other Crimes
Panel A: Outcomes							
Decline to Prosecute	0.0189	0.0203	0.0139	0	0.00865	0	0.0513
Charges Increased	0.0501	0.0522	0.0423	0.0225	0.0738	0.0802	0.0366
Pretrial Detention	0.0892	0.100	0.0487	0.0858	0.0862	0.209	0.0689
Case Dismissed	0.204	0.208	0.189	0.196	0.140	0.594	0.203
ACD	0.196	0.169	0.298	0.261	0.243	0.0984	0.108
Guilty	0.579	0.601	0.497	0.543	0.607	0.303	0.636
Panel B: Case Characteristics							
Black Defendant	0.787	1	0	0.796	0.797	0.770	0.770
Defendant Age	34.01 (12.84)	34.02 (12.97)	33.98 (12.34)	34.12 (12.69)	33.12 (13.32)	32.92 (12.32)	35.28 (12.35)
Defendant Male	0.819	0.825	0.800	0.874	0.756	0.780	0.861
Any Prior Arrests	0.502	0.570	0.250	0.607	0.520	0.417	0.413
Prior Arrests	4.013 (9.282)	4.645 (9.894)	1.685 (6.001)	5.172 (10.45)	4.511 (9.865)	2.118 (5.216)	2.877 (7.957)
Any Prior Conviction	0.445	0.508	0.214	0.525	0.467	0.347	0.374
Prior Convictions	4.152 (9.873)	4.804 (10.54)	1.747 (6.305)	5.280 (11.10)	4.888 (10.42)	1.732 (5.017)	2.865 (8.612)
Any Prior Incarcerations	0.273	0.314	0.120	0.333	0.319	0.178	0.187
Prior Incarcerations	1.986 (5.797)	2.311 (6.243)	0.787 (3.463)	2.619 (6.824)	2.535 (6.389)	0.683 (2.696)	1.083 (4.260)
Black Prosecutor	0.136	0.137	0.133	0.142	0.136	0.133	0.133
Prosecutor Male	0.405	0.407	0.398	0.388	0.412	0.404	0.411
Observations	87461	68798	18663	21798	32959	5984	26720

mean coefficients; sd in parentheses

Notes: ACD stands for adjournment in contemplation of dismissal.

Table 2: Correlation Between Case Characteristics and Prosecutor Race

Panel A: Defendant Characteristics

	Black Defendant	Defendant Age	Defendant Date of Birth	Male Defendant	Any Prior Arrests	Number Prior Arrests	Any Prior Convictions	Number Prior Convictions	Any Prior Incarceration	Number Prior Incarcerations
Black Prosecutor	0.00659	-0.0709	25.50	-0.00189	-0.00479	-0.0979	-0.00720	-0.162	-0.00660	-0.0977
	(0.00499)	(0.203)	(74.01)	(0.00533)	(0.00904)	(0.154)	(0.00975)	(0.162)	(0.00771)	(0.0843)
Observations	87461	87461	87461	87461	87461	87461	87461	87461	87461	87461
Outcome Mean	0.787	34.01	5645.7	0.819	0.502	4.013	0.445	4.152	0.273	1.986

Panel B: Case Characteristics

	Number Arrest Charges	Number Arrest Counts	Class A Misdemeanor	Class B Misdemeanor	Class U Misdemeanor	Drug Crime	Property Crime	Person Crime	Other Crime
Black Prosecutor	-0.0227*	-0.0202	-0.00596	0.00712	-0.00116	0.00779	0.00701	-0.00459	-0.0102
	(0.0123)	(0.0143)	(0.00805)	(0.00772)	(0.00501)	(0.0112)	(0.0148)	(0.00568)	(0.00973)
Observations	87461	87461	87461	87461	87461	87461	87461	87461	87461
Outcome Mean	1.671	1.735	0.618	0.231	0.151	0.249	0.377	0.0684	0.306

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: This table reports the coefficient on *Black Prosecutor* from separate regressions of case and defendant characteristics on a binary variable representing prosecutor race. Each regression includes screening date fixed effects. Standard errors are clustered at the prosecutor level.

Table 3: Estimates of Opposite-Race Bias for Defendant Guilt

	(1)	(2)	(3)	(4)
Outcome: Guilty				
Black Defendant*White Prosecutor	0.0252**	0.0122	0.0115	0.0241**
	(0.0115)	(0.0100)	(0.0100)	(0.0103)
Observations	87461	87461	87461	87461
Outcome Mean	0.579	0.579	0.579	0.579
Prosecutor and Defendant Race Indicators	Y	Y	Y	Y
Screening Date FE	Y	Y	Y	Y
Case-Level Controls	N	Y	Y	Y
Prosecutor FE	N	N	Y	N
Interactions	N	N	N	Y

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: This table reports the coefficient on the interaction of *Black Defendant* and *White Prosecutor* from the regression of *Guilty* on indicators for prosecutor race, defendant race, and the interaction term. Each specification includes screening date fixed effects. Column 2 adds controls for defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. Column 3 includes the same controls as Column 2, with the exception of prosecutor gender, and adds individual prosecutor fixed effects. Column 4 adds interactions for every case and defendant control added in Column 2 interacted with prosecutor race. Standard errors are clustered at the prosecutor level.

Table 4: Estimates of Opposite-Race Bias in Defendant Guilt by Crime Type

	(1)	(2)	(3)	(4)
Panel A: Drug Crimes				
Outcome: Guilty				
Black Defendant*White Prosecutor	0.0211	0.0121	0.00974	0.00590
	(0.0257)	(0.0215)	(0.0231)	(0.0266)
Observations	21798	21798	21798	21798
Outcome Mean	0.543	0.543	0.543	0.543
FDR q-value	0.897	0.711	0.551	0.937
Panel B: Person Crimes				
Outcome: Guilty				
Black Defendant*White Prosecutor	-0.0125	-0.0260	0.000587	-0.00444
	(0.0562)	(0.0543)	(0.0554)	(0.0560)
Observations	5984	5984	5984	5984
Outcome Mean	0.303	0.303	0.303	0.303
FDR q-value	0.992	0.711	0.824	0.937
Panel C: Other Crimes				
Outcome: Guilty				
Black Defendant*White Prosecutor	-0.00740	-0.0247	-0.0287	-0.00995
	(0.0199)	(0.0187)	(0.0195)	(0.0216)
Observations	26720	26720	26720	26720
Outcome Mean	0.636	0.636	0.636	0.636
FDR q-value	0.897	0.711	0.375	0.283
Panel D: Property Crimes				
Outcome: Guilty				
Black Defendant*White Prosecutor	0.0549***	0.0379***	0.0376***	0.0470***
	(0.0159)	(0.0133)	(0.0136)	(0.0151)
Observations	32959	32959	32959	32959
Outcome Mean	0.607	0.607	0.607	0.607
FDR q-value	0.003	0.019	0.008	0.024
Prosecutor and Defendant Race Indicators	Y	Y	Y	Y
Screening Date FE	Y	Y	Y	Y
Case-Level Controls	N	Y	Y	Y
Interactions	N	N	Y	N
Prosecutor FE	N	N	N	Y

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: This table reports the coefficient on the interaction of *Black Defendant* and *White Prosecutor* from the regression of *Guilty* on indicators for prosecutor race, defendant race, and the interaction term. Each specification includes screening date fixed effects. Column 2 adds controls for defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarceration, and indicators for any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. Column 3 includes the same controls as Column 2, with the exception of prosecutor gender, and adds individual prosecutor fixed effects. Column 4 adds interactions for every case and defendant control added in Column 2 interacted with prosecutor race. Robust standard errors are clustered at the prosecutor level. False discovery rate (FDR) q-values are adjusted for multiple inference given the four categories of crime examined. FDR q-values are estimated using the method proposed by Anderson (2008) and are interpreted as two-sided p-values.

Table 5: Mechanism

	(1)	(2)	(3)	(4)	(5)
	Declined Prosecution	Pretrial Detention	Case Dismissed	Charges Increased	Adjournment in Contemplation of Dismissal
Panel A: Entire Sample					
Black Defendant*White Prosecutor	-0.00628*	0.00711	-0.00858	0.00488	-0.00778
	(0.00355)	(0.00663)	(0.00853)	(0.00553)	(0.0117)
Observations	87461	87461	87461	87461	87461
Outcome Mean	0.0189	0.0892	0.204	0.0501	0.196
Panel B: Property Crimes					
Black Defendant*White Prosecutor	0.000574	0.00573	-0.00914	0.0102	-0.0378**
	(0.00340)	(0.0122)	(0.00882)	(0.00772)	(0.0151)
Observations	32959	32959	32959	32959	32959
Outcome Mean	0.00865	0.0862	0.140	0.0738	0.243
Prosecutor and Defendant Race Indicators	Y	Y	Y	Y	Y
Screening Date FE	Y	Y	Y	Y	Y
Case-Level Controls	Y	Y	Y	Y	Y
Prosecutor FE	N	N	N	N	N
Interactions	Y	Y	Y	Y	Y

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: This table reports the coefficient on the interaction of *Black Defendant* and *White Prosecutor* from the regression of *Declined Prosecution*, *Pretrial Detention*, *Case Dismissed*, *Charges Increased*, and *Adjournment in Contemplation of Dismissal* on indicators for prosecutor race, defendant race, and the interaction term. All specifications include screening date fixed effects, controls, and prosecutor race interactions. Robust standard errors are clustered at the prosecutor level.

A   Appendix

	(1) All	(2) Black Defendants	(3) White Defendants	(4) Drug Crimes	(5) Property Crimes	(6) Person Crimes	(7) Other Crimes
Panel A: Outcomes							
Decline to Prosecute	0.0184	0.0197	0.0135	0	0.00840	0	0.0494
Charges Increased	0.0533	0.0555	0.0447	0.0232	0.0759	0.0916	0.0411
Pretrial Detention	0.0910	0.103	0.0502	0.0863	0.0889	0.210	0.0708
Case Dismissed	0.210	0.213	0.195	0.200	0.147	0.592	0.208
ACD	0.196	0.168	0.295	0.261	0.242	0.0986	0.110
Guilty	0.575	0.599	0.494	0.539	0.602	0.306	0.631
Panel B: Case Characteristics							
Black Defendant	0.786	1	0	0.796	0.796	0.769	0.770
Defendant Age	33.98	34.00	34.01	34.06	33.08	32.95	35.25
Defendant Male	0.819	0.824	0.799	0.875	0.755	0.782	0.863
Any Prior Arrests	0.497	0.569	0.250	0.604	0.516	0.414	0.408
Prior Arrests	3.943 (9.187)	4.615 (9.849)	1.668 (5.951)	5.112 (10.38)	4.444 (9.791)	2.114 (5.226)	2.811 (7.823)
Any Prior Conviction	0.440	0.507	0.213	0.522	0.462	0.345	0.368
Prior Convictions	4.071 (9.765)	4.765 (10.48)	1.736 (6.281)	5.214 (11.01)	4.805 (10.34)	1.745 (5.067)	2.786 (8.462)
Any Prior Incarceration	0.268	0.313	0.119	0.330	0.315	0.178	0.183
Prior Incarcerations	1.946 (5.739)	2.291 (6.212)	0.786 (3.468)	2.585 (6.770)	2.491 (6.345)	0.693 (2.729)	1.052 (4.197)
Black Prosecutor	0.136	0.137	0.133	0.142	0.136	0.132	0.133
Prosecutor Male	0.410	0.412	0.403	0.392	0.418	0.405	0.415
Missing Defendant Race	0.0163	0	0	0.00999	0.0130	0.0147	0.0257
Missing Prosecutor Race	0.0182	0.0180	0.0183	0.0136	0.0242	0.00570	0.0172
Observations	91533	70813	19228	22432	34512	6311	28278

mean coefficients; sd in parentheses

Notes: ACD stands for adjournment in contemplation of dismissal.

Table A2: The Effect of Prosecutor Race on Defendant Guilt

	(1) Guilty	(2) Guilty
Panel A: Entire Sample		
White Prosecutor	0.0208*	0.0159
	(0.0118)	(0.00986)
Observations	87461	87461
Outcome Mean	0.579	0.579
Panel B: Property Crimes		
White Prosecutor	0.0273**	0.0191**
	(0.0125)	(0.00939)
Observations	32959	32959
Outcome Mean	0.607	0.607
Screening Date FE	Y	Y
Case-Level Controls	N	Y
Prosecutor FE	N	N
Interactions	N	N

Standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Notes: This table reports the coefficient on *White Prosecutor* from the regression of *Guilty* on an indicator for prosecutor race. Each specification includes screening date fixed effects. Column 2 adds controls for defendant race, age, date of birth, gender, number of arrest charges, number of arrest counts, number of prior arrests, number of prior convictions, number of prior incarcerations, and indicators for any prior arrest, any prior convictions, any prior incarcerations, misdemeanor type, drug crime, property crime, person crime, and arrest Zipcode. Robust standard errors are clustered at the prosecutor level.

Table A3: Missing Values for Property Crimes

	Original Estimate	Missing Controls	Missing Crime Type		Missing Prosecutor Race		Missing Defendant Race					
				Average							Average	
				[95% CI]							[95% CI]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Outcome: Guilty												
Black Def*White Pros.	0.0470***	0.0469***	0.0498***	0.0497	0.0470***	0.0470***	0.0495***	0.0426***	0.0470***	0.0487***	0.0481	0.0442
	(0.0151)	(0.0151)	(0.0161)	[0.0491,0.0508]	(0.0151)	(0.0151)	(0.0153)	(0.0147)	(0.0151)	(0.0153)	[0.0439,0.0522]	[0.0403,0.0479]
Observations	32959	32991	34330	34330	32959	32959	33385	33385	33385	33385	32959	32959
Outcome Mean	0.607	0.607	0.583	0.583	0.607	0.607	0.606	0.606	0.606	0.606	0.607	0.607
Pros. & Def. Race Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Screening Date FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Case-Level Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Prosecutor FE	N	N	N	N	N	N	N	N	N	N	N	N
Interactions	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Missing Control Indicators	-	Y	Y	Y	-	-	-	-	-	-	-	-
Missing Defendant Race	-	-	-	-	-	-	Black	White	.5 Black	.79 Black	-	-
Missing Prosecutor Race	-	-	-	-	White	Black	-	-	-	-	White	Black

Standard errors in parentheses
* p < .1, ** p < .05, *** p < .01

Notes: This table reports the coefficient on the interaction of *Black Defendant* and *White Prosecutor* from the regression of *Guilty* on indicators for prosecutor race, defendant race, and the interaction term. All specifications include screening date fixed effects. Each specification also includes controls, and interactions, similar to Column 4 in Table 3 and 4. Column 1 repeats the estimate for Table 4 Panel D Column 4. Standard errors are clustered at the prosecutor level. Column 2 includes indicators for missing defendant characteristics. Columns 3 replaces all missing crime types as property crimes and Column 4 presents the average and 95% confidence interval from 10,000 iterations of randomly replacing crime type. Columns 5-6 replace missing prosecutor race as white or black respectively. Columns 7-10 replace missing defendant race as black, white, 0.5 black or .79 black respectively. Columns 11-12 present the average and 95% confidence interval from 10,000 iterations of randomly replacing defendant race.