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Racial Disparities in the Acquisition of Juvenile Arrest Records

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Abstract

Using administrative data for California, we first estimate the effect of a prior booked arrest on the likelihood that a future interaction with law enforcement results in a formal booking exploiting the discontinuous increase in the bookings probability at age 18. This analysis reveals evidence of a large causal effect of a prior booked arrest on the likelihood that a future arrest is booked rather than cited on the order of 11 percentage points. We then document very large racial and ethnic disparities in the propensity of law enforcement to formally book, and thus officially record juvenile arrests. A fair share of the black-white disparity can be attributed to difference in arrest offense severity and arrest history, though this is not true for Hispanic-white disparities. In addition, a very large share of the raw differences can be explained by differences in practice between law enforcement agencies that tend to arrest minority youth and law enforcement agencies that tend to arrest white youth. Racial disparities in the propensity to book arrests tend to be largest for offender age ranges, offenses, and in departments where the greatest discretion is exercised.

1. Introduction

Booked arrests (arrests that are formally recorded via processing, and most importantly, finger printing at a local detention facility) along with criminal convictions are the key building blocks of a criminal history record. Such arrests are observed by law enforcement when querying rap sheets in the field. Booked arrests and convictions also enter into future risk assessments and may in some instances be obtained by non-criminal justice actors, such as employers. In many jurisdictions, police are afforded and exercise greater discretion in the handling of youth arrests via a greater use of citations rather than bookings, and by simply resolving incidents through informal counseling.

In this paper, we study racial disparities in the rate at which juvenile arrests are booked by the police. We begin by exploiting the discontinuous increase in the proportion of arrests that are booked when arrestees turn 18 to establish a causal relationship between a prior booking and being booked during future interaction with law enforcement. In an analysis of administrative data for California, we find that youth arrested for the first time just before their 18^{th} birthday are significantly less likely to be booked during a subsequent arrest relative to youth arrested for the first time right after their 18^{th} birthday. Scaled by the first-stage change in booking rates for the first arrest, a prior booking increases the likelihood of a future booking conditional on a subsequent arrest by roughly 11 percentage points. This estimate is comparable in magnitude to the estimated marginal effect at the extensive margin of prior bookings on future bookings from a subsequent regression analysis of under-18 arrests only.

We then analyze racial and ethnic disparities in the processing of juvenile arrests. We document large disparities in black relative to white youth booking rates (on the order of roughly

50 percent, or 16.8 percentage points), and smaller yet significant disparities between Hispanic and white youth (on the order of 18 percent or 6.2 percentage points). Including detailed controls for current offense and prior arrest history explains roughly half of the black-white disparity, while controlling for the agency making the arrest (roughly corresponding to the city of arrest) narrows the unexplained residual difference to roughly one-quarter of the unadjusted value. The latter finding reflects two facts. First, black youth and white youth tend to be arrested by different agencies, a pattern reflecting racial segregation across California cities. Second, youth bookings rates for all races and ethnicities are higher in cities with relatively large black and Hispanic populations. This latter pattern parallels the finding in Rehavi and Starr (2014) of more aggressive prosecutions in federal districts that generate disproportionate numbers of federal criminal cases against African Americans.

The data do not permit a sharp outcome test for whether the residual disparities reflect unwarranted differential treatment of African-American youth. We can however explore heterogeneity in the racial-booking disparities to assess whether they are larger when greater discretion is typically exercised. The largest disparities are observed for non-violent felony offenses, such as drug offenses and those that fall under the "other felony" category. In addition, racial disparities are the largest for offenses where the booking rate for whites exhibit the highest variance. We also observe a larger discontinuous increase in bookings rates at 18 for white youth relative to black and Hispanic youth and consequently a narrowing of racial disparities. Since officers have considerably less discretion in processing adult arrests, this pattern suggests that racial disparities are largest for age groups where discretion is the greatest and change discretely when discretion is limited.

Finally, we assess the likely contribution of the differential application of discretion to racial and ethnic disparities in the prevalence of a juvenile arrest record. Focusing specifically on the 1990 to 1993 birth cohorts, the unduplicated counts of individuals with at least one juvenile arrest in the administrative data set amount to approximately two-thirds the population of African American population in this birth cohort observed in the 2013 American Community Survey, 28 percent of the Hispanic population, and 20 percent of the white population. The comparable estimate for those with booked arrests (our proxy for the prevalence of a criminal history record) are 34 percent of black youth, 13 percent of Hispanic youth, and 8 percent of white youth. Completely eliminating the bookings disparity between black and white youth would lower the proportion of African-American youth with a juvenile arrest record to 24 percent, eliminating half the difference in the prevalence of juvenile arrest records between white and black youth. Eliminating the residual racial disparity after accounting for difference in offense characteristics and arresting agency would only narrow the black-white disparity in the prevalence of a juvenile record by eight percent. Bookings disparities explains relatively little of the Hispanic-white difference in the prevalence of juvenile arrest histories.

2. Arrests, Bookings, and the Evolution of a Criminal History Record

Racial disparities in criminal justice involvement are evident in nearly all aspects of the U.S. criminal justice system. African Americans account for nearly 30 percent of arrests (Snyder 2013) and roughly one-third of individuals on probation or parole (Kaeble, Maruschak, and Bonczar 2015); shares that far exceed their numbers in the general population (roughly 13 percent). The lifetime likelihood of ever serving time in a state or federal prison is discretely

higher for African Americans (Bonczar 2003) relative to other racial and ethnic groups as is the proportion incarcerated on any given day (Raphael and Stoll 2013). African Americans also tend to have more extensive criminal histories, a factor that plays an important role in determining pre-trial processing and sentencing (Harcourt 2010; Rehavi and Starr 2014).

In most instances, the lion' shares of these racial disparities are attributable to observable difference in case and individual characteristics. For example, Rehavi and Starr (2014) show that nearly 90 percent of the sentencing differential between African Americans and whites processed in federal criminal court is explained by differences in criminal history and the nature of the individual's current criminal conduct. McCrary and Raphael (2015) show that the racial disparity in the rate at which people are killed by police in the process of arrest are much more narrow when one uses arrests as a benchmark rather than population. Fryer (2016) finds that conditioning on observables narrows (though does not eliminate) inter-racial disparities in non-lethal uses of force by the police. However, Fryer also finds that once one limits the potential pool of incidents to those that might arguably merit lethal use of force, differences in the use of lethal force by police officers stratifying by the race of the suspect disappear.

Nonetheless, most analyses of such disparities find residual differences that cannot be explained by observable factors, suggesting that differential treatment by actors in the criminal justice system or disparate impacts of policy and practice may be contributing factors. Moreover, slight differences in treatment beginning at a young age may have a cumulative impact on future criminal justice involvement and perpetuate and exacerbate racial disparities within specific birth cohorts. For example, several studies employing randomization of criminal cases to judges demonstrate that harsher sentencing begets future criminal activity and poor outcomes in other

domains such as educational attainment, employment, and dependence on public aid (Aizer and Doyle 2015, Mueller-Smith 2015). In addition, there is evidence suggesting that pre-trial detention results in poorer sentencing outcomes for criminal defendants (Dobbie, Golden and Yang 2016), and current practice generally results in higher bail and a lower likelihood of supervised pre-trial release for those with more extensive criminal histories (Angwin et al. 2016). Age at first arrest and other markers of early criminal justice involvement are common elements in local risk assessment practices determining pre-trial release, mandatory conditions of community supervision, and in some instances, criminal sentencing (Monahan and Skeem 2015). To the extent that early interactions with the criminal justice system increases the likelihood of future criminality or flags an individual for harsher treatment in future criminal cases, small differences in treatment early in life may generate large disparities in criminal justice outcomes at later ages.

Nearly all interactions with the criminal justice system begin with an arrest. The definition of an arrest is somewhat ambiguous with the most general definition being when a suspect is no longer free to walk away from an arresting officer (Bergma and Berman 2015) and a more specific definition being when a law enforcement officer detains a suspect with the intention of seeking charges and records the detention (UCR Handbook 2004). Police officers have discretion to handle arrests in different ways depending on the seriousness of the offense. In the least serious cases, the suspect may simply be released with a warning. In the case of juveniles, this often takes the form of a call or visit to the parents or guardians of the child and officially recorded as having been handled internally. For more serious incidents, the suspect may be either issued a citation (a notice to appear in court) or booked and admitted to a local detention facility. A jail

booking may take several hours and involves the collection of identifying information (including name, address, other demographic characteristics, and a set of finger prints), taking a photo of the suspect (the mug shot), strip-searching, and security and mental health screening.

Fingerprints taken at booking are used to create unique biometric identifiers that are key for linking interactions with the criminal justice system. Booked arrests along with prints are reported into state criminal history repositories (the information sources for criminal background checks) as well as to the Federal Bureau of Investigation (FBI) for entry into a 50-state and federal criminal history repository. Criminal arrests (reported at booking) and criminal convictions (reported at the time of case disposition) provide the building blocks for a criminal history record. Arrests that are resolved informally (a call home to parents), citations where criminal charges are not filed, and citations where charges are filed but do not result in conviction will often not be recorded in one's official criminal history record.[1] Hence, the discretion exercised by police officers at the time of arrest may be the difference between having and not having a criminal history record.[2]

[1] In some jurisdictions, individual receiving citations are required to eventually go through a booking process especially when charges are filed or a conviction is obtained. However, informal conversations with criminal justice officials throughout the state revealed that whether or not the individual complies with the booking requirement is not closely monitored in all jurisdictions. In addition, we learned through conversation with data analysts at the California Criminal Justice Information Center (the division of the state Department of Justice that maintains criminal history records) that they sometimes received disposition information (convictions, acquittals etc.) for offenses with no corresponding arrest (referred to informally as an orphaned disposition). This fact suggests that arrests resulting in a citation are less likely to contribute incidents to one's official arrest history.

[2] The generation of actual criminal charges and a prosecution requires further action on the part of police departments and local prosecutors. For adults, the police must present the case to the district attorney's office who can either file formal criminal charges or decline to pursue the case. The latter action may occur for several reasons, including referral of the case to probation or parole if the person is under active community supervision, perceived evidence problems, or assessment that the case is low priority. The police may also close a case by not presenting charges to the district attorney. For juveniles, further case processing requires that the officers refer the incident to the juvenile probation department. The alternative is to handle the case within the department through consultation with the youth or a call to parents. This may occur with or without a booking or citation. Many cases are indeed closed at intake by juvenile probation (roughly 36 percent in 2014). Another 10 percent received informal

Police officers exercise greater discretion with youth arrests than they do with adult arrests. This is clearly evident in the data we analyze. Figure 1 presents the proportion of arrests that are either booked, cited, or neither booked nor cited (handled in another manner) for all recorded arrests in California for the year 2012 by single year of age for all arrestees between 11 and 25. Less than 40 percent (for most ages) of juvenile arrests result in a formal booking while slightly over 40 percent of juvenile arrests result in citations. Roughly one-fifth of all juvenile arrests involve neither a citation nor a booking. Once the arrestee turns 18, however, arrests are handled more uniformly and more harshly. Between 70 and 80 percent of young adult arrests are formally booked while slightly over a fifth are cited. Relatively few adult arrests involve neither a citation nor a booking.[3]

In addition to officer level discretion, the processing of arrests (juvenile arrests in particular) varies considerably across departments with heterogeneity in local practice. In the data we analyze below, we observe juvenile arrests made by over 700 separate law enforcement agencies in California.[4] The inter-quartile range for department-level juveniles booking rates is 0.373 compared to 0.251 for young adults. The comparable figures for the proportion of arrests neither booked nor cited are 0.193 for juveniles and 0.011 for young adults.

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probation or some other form of diversion (Office of the Attorney General 2014). Hence, many booked juvenile arrests do not result in a petition filing against the juvenile. However, the booked arrest remains on the record.

[3] In informal conversations with current and former police officers around the country, we have also learned that the cost to the officer of a juvenile arrest is often higher than the cost of an adult arrest. Juveniles require additional handling, often involving a direct transfer to a juvenile detective that may take the officer off patrol for long periods of time. Some jurisdictions streamline this process or create specialized locations for juvenile processing that minimizes these transactions costs. Adult arrests on the other hand are easier to process and in some jurisdictions may actually involve handing off the suspect in the field.

[4] Roughly 75 percent of arrests are made by local municipal police departments, 20 percent by county sheriffs, and roughly 5 percent by other law enforcement agencies such as the California Highway Patrol, transit police departments, and other special district police departments.

As we will soon document, there are enormous racial and ethnic disparities in how juvenile arrests are processed. In what follows we explore the consequences and sources of these disparities.

3. Empirical Strategy and Description of the Data Source

In this section, we lay out our empirical strategy for studying racial disparities in the processing of juvenile arrests. We begin by describing the administrative data used in this analysis. We then outline a regression-discontinuity design strategy to assess whether an initial booking causally increases the likelihood of a future booking conditional on being detained by the police. Finally, we describe our strategy for documenting racial disparities and assessing the degree to which such disparities reflect differential treatment.

3.1 Description of Multiple Arrest and Citation Register and Documentation of Racial Disparities

The data for this project comes from the Monthly Arrest and Citation Register (MACR) collected by the California Department of Justice Criminal Justice Statistics Center. The MACR includes micro-level data on all recorded arrests and citations occurring in the state of California. Data are available back to 1980, though in this paper we use various subsamples of the arrests occurring between 1990 and 2014.[5] The dataset includes information on the arrest date, arrest status (booked, cited, or other), arrest disposition (handled internally or referred to another criminal justice agency), and various demographic characteristics of the arrestee (age, gender, and race/ethnicity as perceived by the arresting officer). The data also includes detailed

[5] Youth booking rates in the data increase considerably during the 1980s suggestive of greater use of this particular field by officers. Rates stabilize in the late 1980s. For this reason, we do not use data from the 1980s.

information on the most serious charge recorded at arrest (with 274 separate offense code values) and the arresting agency (over 700 separate agencies for the period we analyze).

We employ different subsets of these data in the analysis that follows. For the purpose of presenting descriptive statistics we focus here on the sample used for estimating racial disparities. Our analysis of racial disparities focuses on arrests of youth between the ages of 11 and 17 who are born in 1990 or later. We restrict the analysis samples to those individuals meeting these criteria who were arrested in the year 2012 or earlier. Hence, we are analyzing data on youth arrests from the years 2001 through 2012. The administrative data includes individual names as recorded by the arresting officer as well as birthdates. We use this information to construct arrest histories at time of arrest.[6]

The data reveal very large racial and ethnic disparities in how juvenile arrests are processed. Figures 2 through 4 document this pattern. Figure 2 displays the proportion of youth arrests that result in a booking, a citation, or neither a booking nor a citation.[7] Black youth are 17 percentage points more likely than white youth and 11 percentage points more likely than Hispanic youth to be booked when arrested. White youth are the most likely to be cited, and are approximately 40 percent more likely to be neither booked nor cited relative to black youth. Observable disparities are similar when we restrict the sample to first-time arrestees, though booking rates are slightly lower across the board.

[6] Names are clearly measured with error (for example, variation in spelling, inclusion of middle names, reversing first and last name, etc). Hence, all variables that we construct based on names and date of birth will also contain some measurement error. Since the MACR do not constitute the official criminal histories of individuals and are simply administrative data used to generate arrest totals for the federal Uniform Crime Reporting Program, there is no biometric identifier that would permit linking incidents within this file.

[7] The figure displays separate tabulations for black, Hispanic, and white youth. While the data include more race/ethnicity categories, these three groups constitute approximately 94 percent of juvenile arrests in the state.

Figure 3 explores whether these disparities vary by age. For all juvenile arrests and for first-time arrests we observe sizable differences with African-American youth most likely to be booked followed by Hispanic youth and white youth within all age groups. The disparities appear to widen between the ages of 11 and 17. In figure 4, we tabulate the proportion booked, proportion cited, and the proportion neither booked nor cited (labeled other in the figure) by arrest for highly criminally active youth (arrested at least four times). Within racial/ethnic groups, we observe booking rates increasing with subsequent arrests, citation rates declining, and the proportion informally resolved declining as the youth accumulate additional arrests. Several factors may explain this pattern. First, police officers may grow increasingly impatient with youth who are repeatedly arrested and thus be more likely to book the arrest and refer the youth to juvenile probation. Alternatively, prior bookings may beget future bookings, to the extent that a prior booking generates an official criminal history record observables by officers in the field.

Figure 4 also reveals sizable racial disparities in the processing of youth arrests even accounting for the number of prior arrests among this fairly criminally active sub-sample. The bookings rate for white youth on their fourth observed arrest (0.49) is 15 percentage points lower than comparable rate for black youth and only three percentage points higher than black youth in this sub-sample at their first arrest. Moreover, 15 percent of white youth on their fourth incident are neither booked nor cited compared with 9 percent of black youth on their fourth incident. The proportion neither booked nor cited among white youth on their fourth arrest actually exceeds slightly the comparable proportion for black youth on the first arrest.

To be sure, there are differences in the average characteristics of arrests involving youth of different racial and ethnic groups. Table 1 illustrates this point.[8] There are no appreciable racial difference in average age, average age at first arrest, or in gender composition. African-American and Hispanic youth are considerably more likely to have a prior booking at the time of arrest relative to white youth and have slightly more prior arrests on average. We do, however, see substantial differences in arrest histories and the composition of current and previous charges. For example, 23 percent of black juvenile arrestees have a prior incident where the most serious offense was a felony. The comparable figures for arrested white and Hispanic youth are 14 and 20 percent, respectively. African American youth are also more likely to have prior violent felony incidents. Regarding the current arrest offense, 25 percent of the arrests of whites are for felony charges, compared with 38 percent of black arrests, and 26 percent of Hispanic arrests.

Beyond the difference in Table 1, there are also large imbalances in which law enforcement agencies arrest which youth. Municipal police and county sheriff departments account for nearly 95 percent of arrests.[9] As the distribution of youth across municipalities differs by race, the distribution of juvenile arrests across municipalities also differs by race. To characterize the extent of this imbalance, we calculate dissimilarity indices between the

[8] To generate the arrest history variables, we bin all arrests into the following broad offense categories: felony person, felony property, felony drug, felony other, misdemeanor, and status offenses. Status offenses are offenses that are defined for juveniles only, such as curfew violations, incorrigibility, being a runaway, or truancy. For each arrest incident we tabulate the total number of prior incidents for each of these categories. We also tabulate the prior number of booked arrests.

[9] In the empirical analysis below, we treat local municipalities that contract with county sheriffs as separate agencies. We do indeed have a crosswalk developed by the California Department of Justice showing which municipalities sub-contract with sheriffs. In many instances, it appears that sheriff departments set up substations with separate staff for such municipalities and thus, we believe it is appropriate that they have their own fixed effect in our attempt to statistically adjust for heterogeneity in local practice. Our results and conclusions do not change appreciable when we allocate all sub-contracted agencies to the corresponding county sheriff.

geographies of youth arrests of different race and ethnicity.[10] The dissimilarity value between black and white arrests is 0.53, indicating that 53 percent of either black or white arrests would have to be hypothetically reallocated across jurisdictions for the white and black arrests distributions to be similar. The Hispanic-white dissimilarity index equals 0.45.

3.2 Empirical Strategy

Our empirical analysis focuses on two broad questions. First, we assess whether the formal recording of an arrest through booking causally increases the likelihood that future encounters with law enforcement will result in a formal arrest. Second, we assess the degree to which racial disparities in youth booking rates can be attributable to differences in offense and criminal history characteristics and evaluate whether the remaining residual disparities are consistent with differential treatment of juvenile suspects by race/ethnicity.

Do bookings beget future bookings?

The descriptive statistics document large racial and ethnic disparities in the handling of juvenile arrests. Given the manner in which official criminal history records evolve, differential treatment will result in racial disparities in the prevalence of criminal history records. Such differences may beget future differential treatment by police, by prosecutors, by judges, and perhaps by prospective employers. While our data do not permit analysis of decision points beyond the initial arrest, we can assess whether a prior booking increases the likelihood of future booking using the personal identifier information in the administrative records to assess whether the outcome of the second arrest depends on the handling of the first.

[10] The dissimilarity index between any two groups varies from zero to one and gives the proportion of youth arrests of any one group that would have to be reallocated across law enforcement agencies to yield comparable arrest distributions across agencies.

To evaluate this relationship, we exploit the fact that booking rates increase discretely at age 18. Specifically, we identify all individuals in the state of California arrested at least twice between 1990 and 2013 where the two arrests occur between their 17th and 24th birthdays. We further restrict the sample to those whose first arrest occurs at the age of either 17 or 18. We construct a running variable measuring the date of the first arrest relative to the arrestee's 18th birthday and estimate the effect of a prior booking on the likelihood of a booking at the second arrest based on the discrete variation in the first-arrest booking rate occurring at the 18th birthday.

The top graph in Figure 5 presents the first stage relationship between the proportion of first arrests that are booked and the date of the first arrest relative to the arrestee's 18th birthday. The figure reveals a discrete and significant increase in the bookings rate at the 18th birthday of roughly 14 percentage points. The bottom half of figure 5 shows the reduced-form relationship between the proportion of second arrests that are booked and the date of arrest relative to the 18th birthday for the first arrest. The figure reveals a statistically significant break in second-arrest booking rates for those with first arrests that bracket the 18th birthday.

Figure 6 presents comparable scatter plots for various demographic characteristics and for the number of arrests for each value of the running variable. There are slight increases in the proportion black at 18 as well as in the proportion female. We also observe a decline in the number of recorded arrest incidents in the days leading up to the 18th birthday and a discrete increase at 18. This is due to the fact that the sample is restricted to those with at least two arrests. Appendix Figure 1A shows a discrete increase in the likelihood of a second arrest within three years for those arrested on or after their 18th birthday, where the complete sample of

youths arrested for the first time at the age of 17 or 18 is used (inclusive of the roughly 75 percent of first time arrestees that are never rearrested). The increase in this re-arrest rate for those over 18 discretely increases the likelihood of surviving our sample restriction (at least two arrests), thus explaining the discontinuity in the arrest density function in Figure 6.[11]

Below, we present instrumental variables estimates of the effect of being booked at the first arrest on the likelihood of being booked during the second arrest. We specify the first-stage regression to include a dummy variable indicating that the individual is over 18 at the time of the first arrest, a quadratic function of the running variable (first arrest date relative to 18th birthday), interaction terms between the quadratic function and the dummy measuring over 18 at first arrest, and varying sets of additional covariates. We control extensively for the characteristics of the first and second arrest and for arresting agency.

To what extent to differences in observable factors as opposed to differential treatment explain racial disparities in bookings rates?

We use simple regression analysis to assess the degree to which inter-group disparities in the likelihood that an arrest is booked can be explained by group disparities in incident characteristics, individual characteristic, observable arrest history, and inter-agency variation in practice. In addition to assessing the sensitivity of observed racial disparities to controlling for these various sets of covariates, we are also interested in using these data to further explore the relationship between prior and future bookings for comparison with the RD results.

[11] Appendix figure 1B shows a comparable change in booking rates for all first arrests at the 18th birthday.

As we will soon see, much of the disparities documented above are attributable to differences in offense characteristics, arrest and booking history, and distribution of arrests across law enforcement agencies. However, after controlling for those covariates, statistically significant differences in bookings rates equal to roughly one quarter of the raw race and ethnicity differentials remain. Prior research on differential treatment by the criminal justice system has employed a variety of strategies to assess whether residual differences reflect differential treatment of minorities by law enforcement, including controlling extensively for observables and/or outcome tests that assess whether minority criminal suspects are subject to lower probable cause threshold for search, arrests, bail decisions, and other key decision points.[12]

One can certainly imagine potential outcome tests that could be deployed for the question at hand. For example, if the cases of black youth were more likely to be closed at intake by juvenile probation or diverted to an informal alternative sanction, this would be consistent with differential treatment of black youth by the police and corrective, offsetting behavior by subsequent up-stream criminal justice actors. Published aggregate data by the California Attorney General suggests the opposite; the cases of black youth referred to juvenile probation

[12] In an analysis of federal sentencing disparities, Mustard (2001) controls extensively and flexibly for criminal history, offense severity, and whether the defendant cooperates with authorities in the prosecution of another, and interprets residual disparities as reflecting differential treatment. Knowles, Persico, and Todd (2001) and Sanga (2009) test for differential contraband discovery rates between blacks and whites searched by police, the insight being that a lower hit rate for police searches of African Americans would indicate that black suspects are being held to a lower evidentiary standard. Ayres and Waldfogel (1994) assess whether the percent charged against a set bail amount by private bail bonds companies differs for African-American criminal defendants relative to white criminal defendants. Based on the finding that bail bondsman charge lower percentages to African-American defendants, the authors infer that judges are setting higher bail amounts for African Americans conditional on the risk of pre-trial misconduct. As one further example, Anwar and Fang (2006) as well as Antonovics and Knight (2009) derive tests for differential treatment of criminal suspects based on tests for interaction effects between officer and citizen race.

are less likely to be closed at intake or diverted than those of white youth (Office of the Attorney General 2014). However, as the descriptive statistics presented in Table 1 reveal, cross-racial differences in average case characteristics make it impossible to draw any conclusion from this aggregate pattern. Unfortunately, we do not have case-level data at the current time on upstream actions taken by juvenile probation for these cases.

An alternative strategy would be to assess whether racial and ethnic disparities are larger for incidents, places, or age ranges where greater discretion is exercised. For example, suppose that juvenile homicide arrests are always booked. An officer who cites a juvenile homicide suspect or simply returns the suspect to his or her parents would certainly draw scrutiny. Alternatively, suppose that juveniles violating a local curfew are never booked. Harsh treatment of a juvenile for a minor violation may also draw negative attention. In both examples, the circumstances of the case limit discretion and thus one would expect equal treatment regardless of irrelevant suspect demographic characteristics.

By contrast, offenses that are sometimes booked and sometimes not permit greater leeway for the officer to decide how to proceed based on aggravating and mitigating factors. A difference in outcome between any two given youth that may differ by race or ethnicity would not be unusual for offenses that are booked half the time and not booked the other half. To the extent that discretion is exercised in a biased manner, one would expect to see greater racial disparities in processing outcomes for arrest offenses where greater discretion is afforded. On the other hand, to the extent that racial disparities reflect unobservable heterogeneity in case characteristics, one would expect to see comparable racial processing differences in high and low discretion cases.

We operationalize this strategy by testing for difference in racial disparities across various dimensions where one might argue a priori that the discretion afforded to officers varies. First, we assess whether the discontinuous increase in bookings at age 18 is larger for white youth relative to black and Hispanic youth. Evidence of a relative larger increase for white youth would be indicative of a narrowing of racial disparities when moving from an age range where the officers have more discretion to an age range where the officers have less discretion.

Second, using white juvenile arrests we estimate booking rates for 76 broad offense types (an aggregation of the 274 offenses we observe) and stratify the offense into bins according to the mean booking rates. We test for larger racial disparities in the bins with higher variance in white booking rates (i.e., those arrests where mean booking rates are nearest to 0.5).

4. Regression-Discontinuity Estimates of the Effect of Prior Bookings on Future Bookings

Table 2 presents instrumental variable estimates of the effect of being booked at the first arrest on the likelihood that the second observed incident results in a booked arrest exploiting the discontinuous increase in the booking rate at the 18th birthday. The first model specification includes a quadratic function of the running variable (first arrest date relative to 18th birthday in days), a dummy for over 18 at time of arrest, and interactions between the running variable function and this dummy in the first stage. Specification (2) adds fixed effects for the race/ethnicity gender, the most serious charge at first arrest, and the most serious charge at the second arrest. Specification (3) adds dummy variables for arresting agency (over 700 additional fixed effects). We present separate estimates for all second arrests, for felony and misdemeanor

second arrests, for the second arrests of black, white and Hispanic defendants, and for the second arrests of males and females.

Beginning with the results for all arrests, all estimates are positive and statistically significant at the one percent level. However, adding controls for first arrest charge and second arrest charge causes a large decline in the estimated effect from roughly 24 percentage points to 12. The distribution of arrest charges changes somewhat as youth pass through their 18th birthday, as a series of charges that are usually labeled "status offenses" are no longer available to the arresting officer.[13] Adding controls for arresting agency reduces the estimate slightly to 11 percentage points. As we will see in the next section, this estimate is similar in magnitude to a simple estimate of prior bookings among juvenile arrestees that conditions on observable covariates.

The effect is considerably smaller yet marginally significant when the second offense is a felony (roughly 4 to 5 percentage points). Here, adding fixed effects for first arrest and second arrest charge has no measurable impact on the prior-booking effect. Neither does adding controls for arresting agency. Effects are much larger for misdemeanor arrests and exhibit greater sensitivity to controlling for first and second arrest charges. The estimate from the base specification is an implausible 39 percentage points. Adjusting for first and second offense characteristics as well as fixed effects reduces this estimate to 15 percentage points. All of the

[13] These charges include the categories truancy, runaway, curfew violation, incorrigible, and other status offense, and are defined as juvenile offenses. These offenses constitute roughly 10 percent of charges for arrests occurring right before the 18th birthday and mechanically drop to zero percent at the 18th birthday. Consequently, the underlying first-stage effect of crossing the age-18 threshold on booking at first arrest declines from roughly 15 percentage points to 10 percentage points when the fixed effects for first arrest charge are included (the first-stage results and reduced form equations are presented in appendix Table 1 for all arrests for the three specifications).

estimates for misdemeanor second arrests are statistically significant at the one percent level of confidence.

When models are estimates separately by race, there is some evidence consistent with larger effects or prior bookings for white youth relative to black and Hispanic youth. However, the estimates by race in the final specification have overlapping confidence intervals. Finally, we observe the largest effects of prior booking for female criminal defendants. From the final specification, a prior booking increases the likelihood of being booked at the second arrest by 33 percentage points for females and roughly eight percentage points for males.

5. Estimation of Residual Racial Disparities Conditional on Observables

Tables 3 and 4 contain our principal analysis of racial disparities in the likelihood that a juvenile arrest (arrests occurring at the age of 17 or younger) is booked. Table 3 presents the results from linear probability models using the all juvenile arrests. Table 4 presents analysis of the sub-samples defined by broad offense categories. In all models, we cluster the standard errors by law enforcement agency.

In Table 3, we begin by estimating unadjusted differences in booking rates relative to white youth. We then consecutively add basic demographics (gender, age), 274 dummy variables indicating the most serious current charge, controls for the number of prior arrests by offense type, the number of prior bookings, and in the final model, a full set of fixed effects for arresting agencies. Collectively, adjusting for these alternative sets of control variables reduces the unexplained black-white differential in bookings rates from 0.163 to 0.039, basically closing 76 percent of the gap. Analyzing the results across specifications reveal two key sets of variables,

which explain much of the racial disparity in arrest processing. First, holding constant the most serious current charge reduces the black-white gap from 0.164 to 0.092 (a 44 percent decline). Controlling for prior arrests and prior bookings narrows the difference further, but only slightly. Second, adding controls for arresting agency reduces the residual black-white difference to 0.039. Hence, black-white differences in the types of offenses generating arrests and in the practices of agencies that typically arrest black as opposed to white youth are key factors. The remaining disparity is statistically significant at the one percent level of confidence.

We observe a somewhat different pattern for Hispanic-white bookings differences. While smaller in magnitude relative to the black-white disparities, Hispanic youth are roughly six percentage points more likely to be booked at arrest relative to white youth. In sharp contrast to the results for the black-white disparity, the relatively higher booking rate for Hispanic youth is not explained by differences in demographics, current offense characteristics, prior arrests by type, nor prior bookings. Across the first five specifications of the table, the disparity is relatively stable at approximately six percentage points. Adjusting for arresting agency, however, explains nearly all of this disparity, narrowing the residual gap to a statistically significant 1.6 percentage points.

The remaining results in Table 3 reveal several interesting patterns, with perhaps the most important pertaining to the role of prior arrest incidents in determining the likelihood that a juvenile arrest is booked. When prior bookings are omitted from the specification, we observe positive and significant coefficients on the number of prior arrest, especially for prior felony arrests. Adding prior-bookings to the analysis reverses the sign of these effects, suggesting that prior arrests impact current booking through an increased likelihood of having been booked in

the past. These results (presented in column (5)) suggest very large effects of prior bookings on future bookings that increase discretely for the first booking (by 25 percentage points) and for each subsequent booking (by between 9 and 14 percentage points). The results in the final column inclusive of agency fixed effects, however, paint a somewhat different portrait. First, all of the coefficients on the prior arrest totals are very near zero, though often statistically significant. Regarding prior bookings, the results from the complete specification suggest that crossing the extensive margin between having ever been booked and never having been booked increases the likelihood of future booking at arrest by roughly 9 percent. However, increases along the intensive margin (more bookings) do not increase the likelihood for the current case. This pattern is consistent with the conjecture that a prior booking, by creating an official criminal record accessible on a squad car screen, increases the likelihood that subsequent arrests are handled more formally. The point estimate of the effect of crossing the extensive margin in the final specification is similar in magnitude to our RD estimates from the previous section.

Table 4 presents bookings disparities estimates for all offenses and for broad offense categories. Panel A presents results for black-white disparities while panel B presents results for Hispanic-white disparities. The results reveal relatively small differences for the least serious offenses (misdemeanor and status offenses) and the largest disparities for less serious felony offenses (drug offenses, other felony offenses). Controlling for specific offenses within broad offense categories and arrest and booking history does not alter this pattern. However, adding a complete set of law enforcement dummies greatly narrows the degree of heterogeneity across offense types. The comparisons of the results in columns (2) and (3) of the table are indicative of the manner in which inter-agency heterogeneity in practice contributes to racial and ethnic

disparities in bookings rates. Adding agency dummies leads to particularly large declines in residual black-white bookings disparities for felony property offenses (from 0.161 to 0.054), felony drug offenses (0.186 to 0.047), and other felony offenses (0.166 to 0.065), suggesting that agencies that disproportionately arrest African-American youth are the most likely to book juveniles for non-violent felony offenses. Similar patterns are observed for the Hispanic-white disparities.

6. Differential Treatment or Unobserved Heterogeneity?

The patterns thus far suggest that (a) a prior bookings increases the likelihood that future interactions with the police results in a formal arrest, (b) minority youth are much more likely to be booked than white youth, and (c) most though not all of the racial and ethnic disparities in how juvenile arrests are handled can be explained by factors readily observable at the time of arrest. In this section we turn to an assessment of whether the residual disparities reflect differential treatment as opposed to unobserved heterogeneity.

While we are unable to conduct sharp outcome test with our date, we can assess whether racial and ethnic disparities in bookings rates are largest when discretion is the greatest. We exploit two sources of variation in discretion. First, we assess whether racial disparities decline for arrests occurring after the 18th birthday. Second, we assess whether disparities are larger for offenses where the variance in bookings rates are greatest.

Figure 7 plots booking rates for arrest by date of arrest relative to the 18th birthday for all arrests of 17 and 18 year olds occurring between 2000 and 2014. Averages by day for white youth are marked by green triangles. The comparable averages for Hispanic youth are marked

by red dots while the comparable averages for black youth are marked by blue x's. For all arrests, we observe discrete increases in bookings within groups, though important differences in levels among both youth arrested before and after their 18th birthdays. There appears to be somewhat larger visible increase for white youth. Within offense categories, the pre-post 18th birthday differences by race and more visible. Within specific offense categories we observe much greater variance in these averages for arrests occurring prior to the 18th birthday relative to arrests made after. Moreover, the cloud of bookings observations for white youth generally lies below that for Latino youth, which in turn lies below that for black youth. The variance and these differentials narrow considerably for arrests made after the age of 18. This pattern is especially strong for felony drug offenses and other offenses.

Table 5 formally tests whether these inter-racial and inter-ethnic disparities narrow for arrests made on the 18th birthday or later. The table presents the pre-post 18 discontinuity in bookings rates for white youth (the coefficient on the variable over 18 in the table), and the extent to which the pre-post change differs for black and Hispanic youth.[14] Specification (1) presents unadjusted estimates of these coefficients, specification (2) adds controls for gender and arrest offense, while specification (3) adds controls for arresting agency. For all offenses combined, there is a discontinuous increase in the bookings rate for white youth of roughly 20 percentage points. The increase is only slightly smaller for black youth (by four percentage points) and insignificantly smaller for Hispanic youth. Adjusting for observable in specifications

[14] The full specification of the underlying regression model is discussed in section 3 above and in the notes to table 5.

(2) and (3) yield qualitatively similar results, though the change for Hispanic youth becomes statistically distinguishable from that for white youth.

Within offense category however, there is considerably greater evidence of pre-post 18 narrowing in racial bookings disparities. We observe the largest discontinuous increase in the booking rate for white youth for property and drug felonies, on the order of nearly 30 percentage points. For property offenses, the increase at 18 in the bookings rate for black youth is 12 to 14 percentage points lower than that for white youth. For drug offenses, this increases is 14 to 15 percentage points lower. The difference in discontinuities suggests that the Hispanic-white disparities narrows 9 to 10 percentage points for property felonies and by 12 to 13 percentage points for drug felonies. We see similar large changes for other felonies but relatively little narrowing for misdemeanors arrests.

Table 6 explores heterogeneity in bookings rates in a slightly different manner. We begin by estimating the rates at which white youth are booked for each of 76 broad offense categories. We then sub-divide all arrests into nine groups by the bookings propensity for the arrest offense ordered from lowest to highest bookings rates.[15] Finally, we estimate racial and ethnic disparities in bookings rates within each group. The goal here is to assess whether disparities are largest for offenses with the highest bookings-rate variance. Given that the bookings outcome is a dichotomous variable, bookings variance is the highest in the intervals 0.4 to 0.5 and 0.5 to 0.6.

The table reveals a fairly clear pattern of heterogeneity in the bookings disparities. First, disparities are the largest for the high variance offenses, with the absolute largest disparities for

[15] We group arrests by the white booking rate into the grouping 0.0 to 0.1, 0.1 to 0.2, 0.3 to 0.4. and so one. We combine the two highest groups (0.8 to 0.9 and 0.9 to 1.0) into one group due to relatively small number of arrests in the highest booking rate categories.

offenses in the 0.5 to 0.6 strata for all specifications and for both the black-white and Hispanic-white disparities. Second, comparing the lower-bookings rate groups to the higher bookings rate groups suggests that the disparities tend to be larger for offenses with bookings rates above 0.5 relative to offenses with similar bookings rate variance below 0.5. For example, the residual black-white disparity in column (2) for offenses in the white bookings rate range of 0.6 to 0.7 is 0.101. The comparable difference for offenses in the bookings rate range of 0.3 to 0.4 (offenses with comparable booking variance) is 0.057. This asymmetric pattern is evident to varying degrees through the three specifications and for both black-white and Hispanic-white disparities. Finally, we again see that adjusting for inter-agency differences explains large portions of the inter-racial and inter-ethnic bookings disparities, though residual differences are still the largest for offenses in the 0.5 to 0.6 white bookings strata. Consistent with the findings in Table 5, this suggests that inter-agency disparities in practice as applied to offenses with high bookings variance seems to be a key driver of racial disparities in juvenile arrest processing.

6. Discussion

In summary, we document very large racial and ethnic disparities in the propensity of law enforcement to formally book, and thus officially record juvenile arrests, with black youth booked at the highest rate, followed by Hispanic youth, and white youth. A fair share of the black-white disparity can be attributed to difference in arrest offense severity and arrest history, though this is not true for Hispanic-white disparities. In addition, a very large share of the raw differences can be explained by differences in practice between law enforcement agencies that tend to arrest minority youth and law enforcement agencies that tend to arrest white youth. While

race/ethnicity specific bookings rates are highly correlated across agencies, the segregation of youth of different race and ethnicities across California cities, coupled with tougher policing practices in cities with larger minority populations leads to sizable differences in the propensity to formally book minority youth (black youth in particular).

We also present evidence using both simple regression analysis conditioning on observables and an RD-design indicating that once one becomes formally involved with the criminal justice system this increases the likelihood of further criminal justice involvement. In particular, we find that variation along the extensive margin in prior bookings is associated with a discrete increase in the likelihood that a future incident is booked, while variation along the intensive margin is not. One potential explanation for this empirical pattern concerns the fact that prior arrests that are booked appear on criminal history records while those that are not booked often will not. Law enforcement officers in the field are able to query criminal histories in their patrol cars using the California Law Enforcement Telecommunication System (CLETS), and presumably may handle juveniles with prior booked arrests more formally than juveniles without. Interestingly, greater discretion in youth arrests is often justified in informal conversations by a desire to keep people "out of the system" based on the supposition that once one has a formal criminal record one is treated differently by law enforcement and other agents of the criminal justice system. More research on this question in particular is needed.

While we cannot construct a sharp test for differential treatment by law enforcement, we can draw some conclusions based on heterogeneity in the racial/ethnic bookings disparities by offense and agency. First, we should note that roughly three quarters of the black-white disparity and two-thirds of the Hispanic-white disparity are attributable to observable factors including

offense severity and arresting law enforcement agency. While one might question why some police departments are tougher than others, the data do reveal a strong correlation across departments between the bookings rates of youths of different races and ethnicities. That is to say, departments that are tough with black youth are also tough with white and Hispanic youth.

Regarding the residual disparities that survive controlling for offense severity and arresting agency, we do observe larger disparities for age ranges, offenses, and in departments where the greatest discretion is exercised. We also document an interaction effect between the degree of leniency displayed for white youth and the bookings disparities by offenses. While this is not decisive evidence of differential treatment, the data do indicate that further exploration of this very early decision point in the criminal case process flow is warranted. Further research should assess whether there is evidence of corrective actions by criminal justice agents further up-stream (higher propensity of juvenile probation to close cases at intake, divert to non-incarceration alternatives, or a higher likelihood of acquittal), or whether future actions concur and thus potentially validate the residual disparities documented here.

A further issue raised by the findings here concerns whether the differential treatment of minority youth is permanently impacting their life prospects via the creation of a criminal history record. Employers increasingly use criminal history records in screening applicants and audit evidence suggests that even arrests without conviction may impact employer hiring choices (Uggen et. al. 2014). Moreover, the results here suggest that police officers likely consult criminal histories in deciding how to proceed with specific incidents. Risk assessments for pre-trial release and bail decisions, community supervision conditions for prison and jail releases, and increasingly sentencing rely on such factors as number of prior arrests and age at first arrest. Harcourt (2010)

argues that criminal history has increasingly become a "proxy" for race and that risk assessment tools that rely on criminal history in making important supervision and sentencing determinations may be unwarrantedly contributing to racial inequality. Similar arguments are made in Starr (2014), who proposes that risk assessment, especially in the context of criminal sentencing, may be validating and reifying past discriminatory treatment. While Harcourt does not provide a precise definition of what he means by "proxy" and why the correlation of criminal history with racial categorization should lead one to be against risk assessment, the findings in this paper present one concrete justification that may call into question the value of certain predictors commonly used in risk assessment tools. Specifically, to the extent that black youth are disproportionately exposed to police departments that handle the arrests of young people more harshly and who face police officers who treat them differentially, racial disparities in arrest history will in part reflect racial disparities in treatment. Moreover, to the extent that in the future black youth will be exposed to police departments that handle arrests of young people more harshly and face police officers who treat them differentially, racial disparities in arrest history will predict racial disparities in future arrests.

Of course, our results show large black-white disparities in offense severity, a fact in and of itself that would generate more booked arrests among African American youth. Moreover, if black youth are arrested more times on average, the exposure risk to a booking will be higher simply as a matter of frequency. As a final task, we explore the degree to which closing the bookings rate gap would narrow racial disparities in the proportion of young people with recorded juvenile arrest histories. We focus on youth born between 1990 and 1993, all of whom reach 18 by 2011 and thus for whom we observe all recorded juvenile arrests. For black, white,

and Hispanic youth, we first tabulate the number of youths by observed juvenile arrest totals. We then calculate the average booking rate by race/ethnicity for first arrests, second arrest, third arrests, and so on. Next we use a simple probabilistic model to simulate the proportion of each group that has ever been booked given the distribution of each racial group by juvenile arrest totals and the booking rate by incident order.[16] This simple model is then used to estimate what the proportion with a booking would be if black and Hispanic youth were booked at the same rate as whites, if the inter-racial gaps were narrowed to one-half the actual gap (equivalent to accounting for the effect of offense severity), and if the inter-racial gaps were narrowed to one quarter (equivalent to accounting for offense severity and differences in the distribution of arrests across law enforcement agencies). With these simulated booking rates, we then generate population totals for these particular birth cohorts with any juvenile bookings. Comparison of these totals to population estimates for California from the 2013 American Community Survey (ACS) (pertaining to calendar year 2012), allow us to assess the likely effect of closing the racial and ethnic booking gaps on the proportions of these cohorts with juvenile arrest records.[17]

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[16] More formally, let B_{ij} be the observable booking rate for youth of race i=(black, white, Hispanic) on arrest j=(first, second, third,…). Assuming that these empirical booking rates apply to the arrest of all youth of race i on arrest j, the likelihood of every having been booked can be calculated in the following manner. The likelihood that a youth of race i who is only arrested once is ever booked is given by B_{i1}. The likelihood that a youth arrested twice is ever booked is given by $1-(1-B_{i1})(1-B_{i2})$, equal to one minus the probability of never having been booked. Similarly the likelihood that a youth arrested three times is ever booked is given by $1-(1-B_{i1})(1-B_{i2})(1-B_{i3})$, and so on. Multiplying these probabilities by the frequency count of youth by total arrests provides a simulation estimate of the fraction of youth that have ever been booked taking into account differences in racial booking rates by arrest order and racial differences in the distribution of youth by number of juvenile arrests. Substituting the booking rates for a different racial group or booking rates that are half-way between the rates for say, black and white youth, permits simulation of what the proportion ever booked would be.

[17] We use the ACS to estimate the population total for non-Hispanic blacks, non-Hispanic whites, and Hispanics born between 1990 and 1993 who are residing in California in 2012. Note, police agencies across the state sometimes identify Hispanics as whites and in some instance (San Francisco being a prominent example) always count Hispanics as white. Hence, our estimates of prior juvenile arrests histories will be biased upwards for non-Hispanic whites and downwards for Hispanics. This disparity results from a conflation of race and ethnicity in criminal justice statistics that does not conform with the separation of racial and ethnic categories practiced by the U.S. Census Bureau.

Table 7 reports the results of this exercise. Panel A shows simulations for the proportion of youth who are ever arrested that experience at least one booking. Our simple simulations predict that among those youth observed at least once in the MACR data the proportion with at least one booked arrest (and hence a juvenile arrest record) is 0.55 for black youth, 0.45 for Hispanic youth, and 0.37 for white youth. While these values are slightly higher than the actual proportions (by two percentage points in each case), the simulated racial disparities are equal to actual disparities. We simulate three alternative bookings proportions for black and Hispanic youth: (1) assuming booking rates by arrest order for white youth, (2) assuming booking rates by arrest order midway between those for black or Hispanic youth and white youth (closing half the gap), and (3) assuming booking rates equal to the black or Hispanic booking rate minus one-quarter of the gap relative to whites. The simulations reveal that most of the bookings rate gap is driven by racial disparities in booking rates within arrest order with very little driven by black and Hispanic youth having more arrests on average.

Panel B uses these results in conjunction with population estimates from the ACS to estimate the proportion of those born between 1990 and 1993 with a recorded juvenile arrest by the time they turn 18 years of age. Ignoring for the moment whether the arrest is booked, the MACR data in conjunction with the census population estimates imply that 62 percent of black youth in this cohort are arrested at some point between the ages of 11 and 17. The comparable figures for Hispanic and white youth are 28 and 20 percent. Our booking simulations predict that 34 percent of black youth will have a juvenile arrest record compared with 13 percent of Hispanic youth and 8 percent of white youth. The remaining results indicate that if black youth were booked at the same rates as white youth, the proportion with a recorded juvenile arrest

history would drop from 0.34 to 0.24 percent. If half the gap were closed (for example, if black youth were arrested by similar agencies a white youth) the proportion with a juvenile record would decline from 0.34 to 0.29.

These simulation suggest that booking rates differential explain only a portion of the 24 percentage point black-white disparity in having a recorded juvenile arrest history (at most 42 percent of the differential, roughly 20 percent of the differential if one accounts for offense severity, and as little as eight percent of the differential if one adjusts for offense severity and differences in arresting agency). Hence, a higher propensity to come into contact with the police is proportionally more important than higher booking rates in explaining the relatively higher proportion of African Americans who enter young adulthood with an official arrest record. Nonetheless, the differential processing of black arrests aggravates this disparity.

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Figure 1: Proportion of Arrests Made in California in 2012 that are Booked, Cited, or Neither (Other) by Age for those 11 to 25 at Time of Arrest

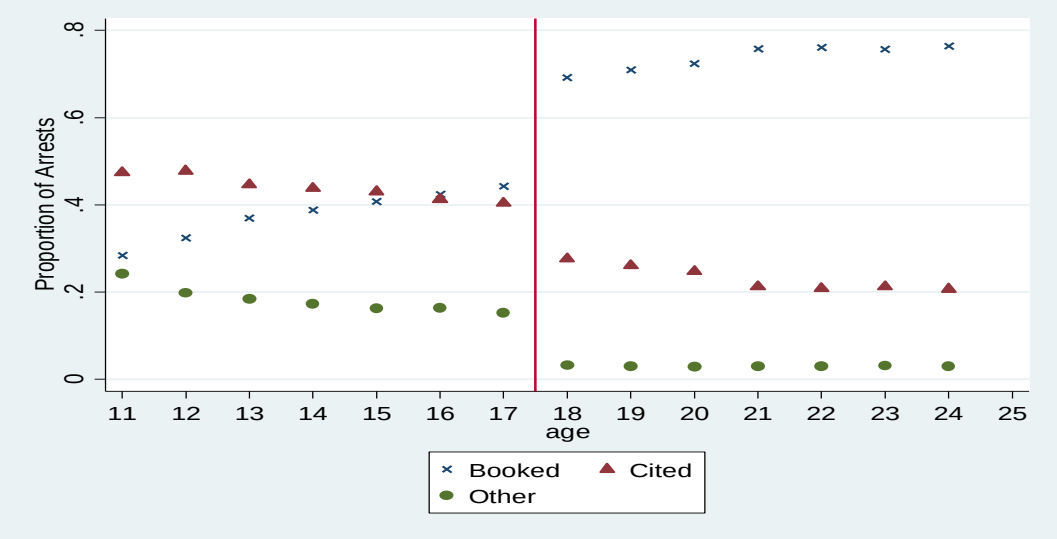


Figure 2: Status of Arrests by Race/Ethnicity: All Juvenile Arrest and for Youth Arrested for the First Time

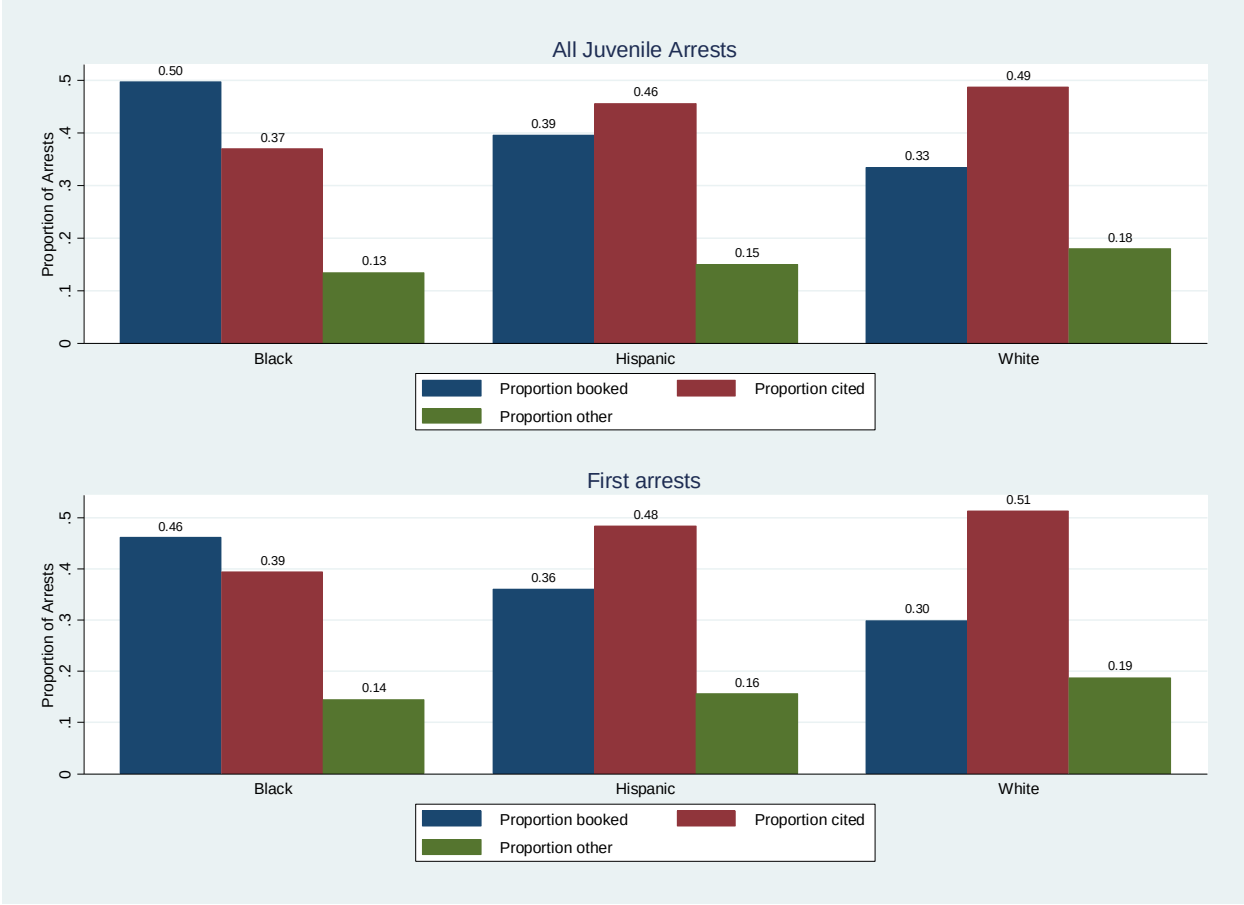


Figure 3: Booking Rates by Age and Race, All Juvenile Arrests and First Arrests

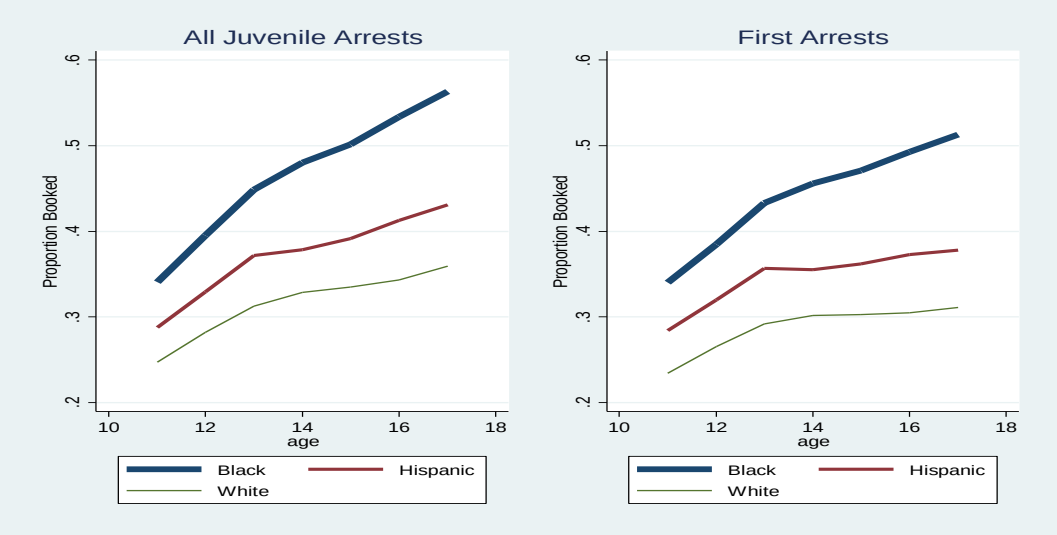


Figure 4: Arrest Status by Arrest Sequence and Race/Ethnicity for those Youth Arrested at Least Four Times

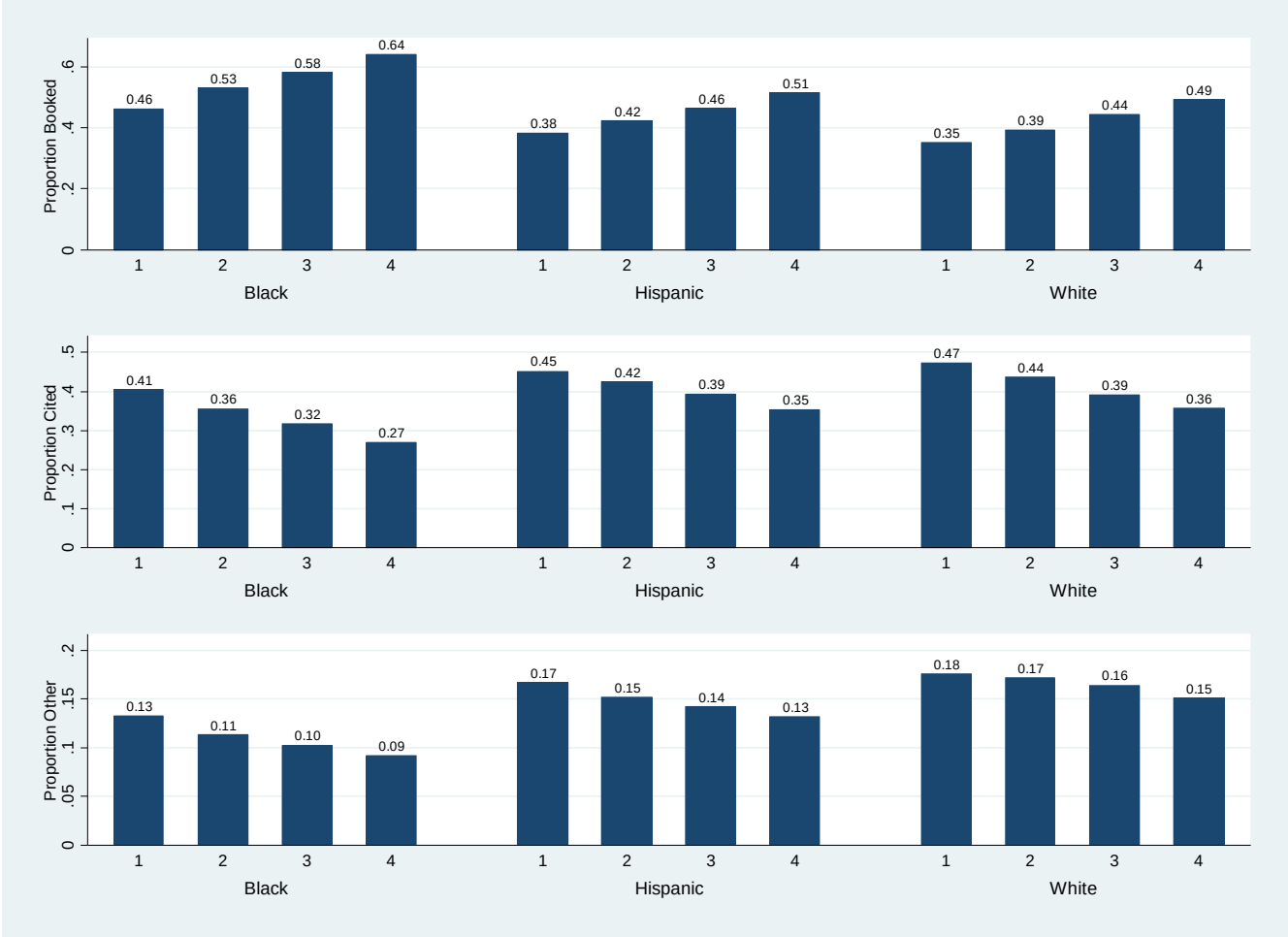


Figure 5: Proportion Booked at First Arrest by Arrest Date Relative to 18th Birthday of the Arrestee and the Proportion Booked at Second Arrest by First-Arrest Arrest Date Relative to the 18th Birthday of the Arrestee Among those Arrested Twice

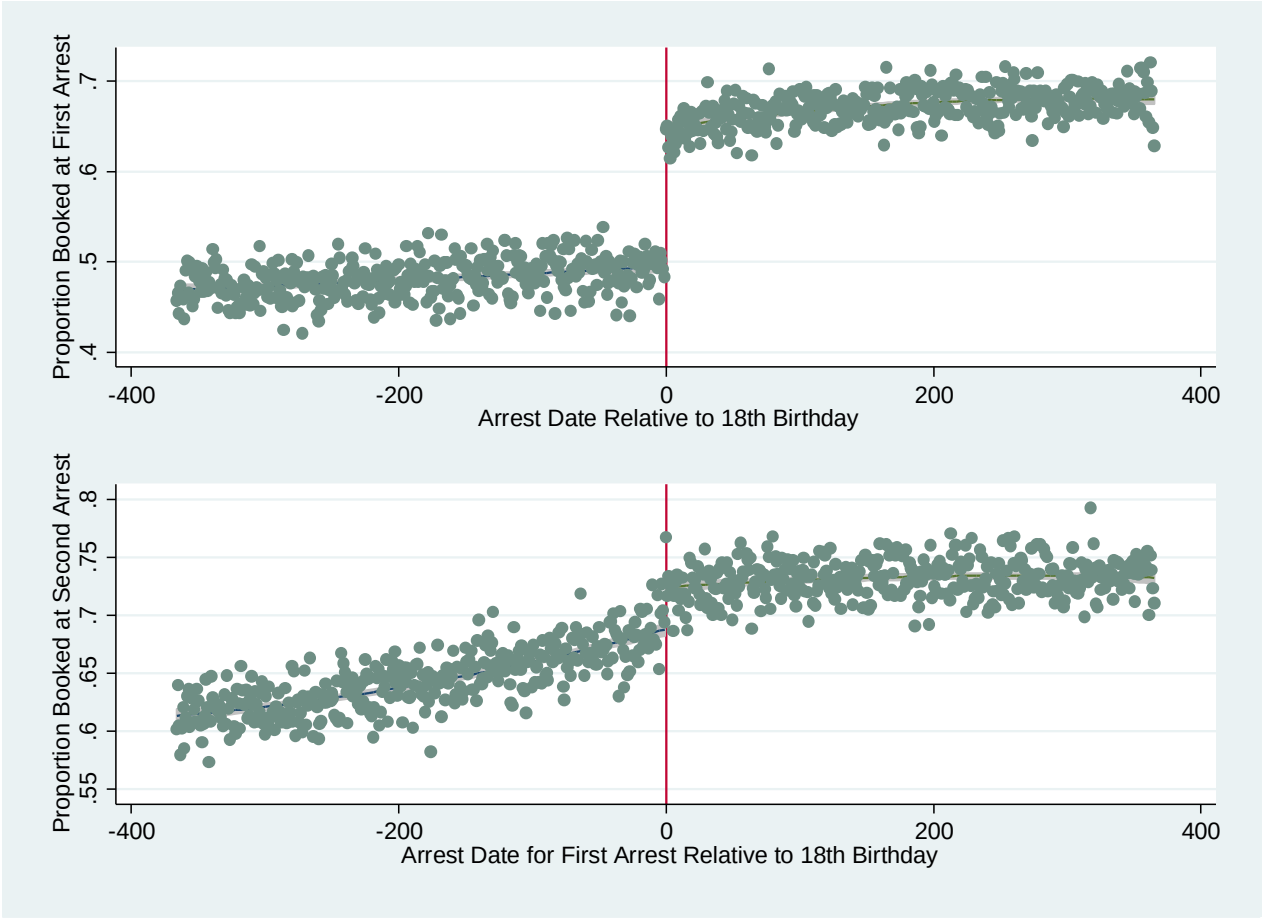


Figure 6: Relationship between Average Demographics Characteristics and Incident Count by Arrest Date Relative to the 18th Birthday of the Arrestee

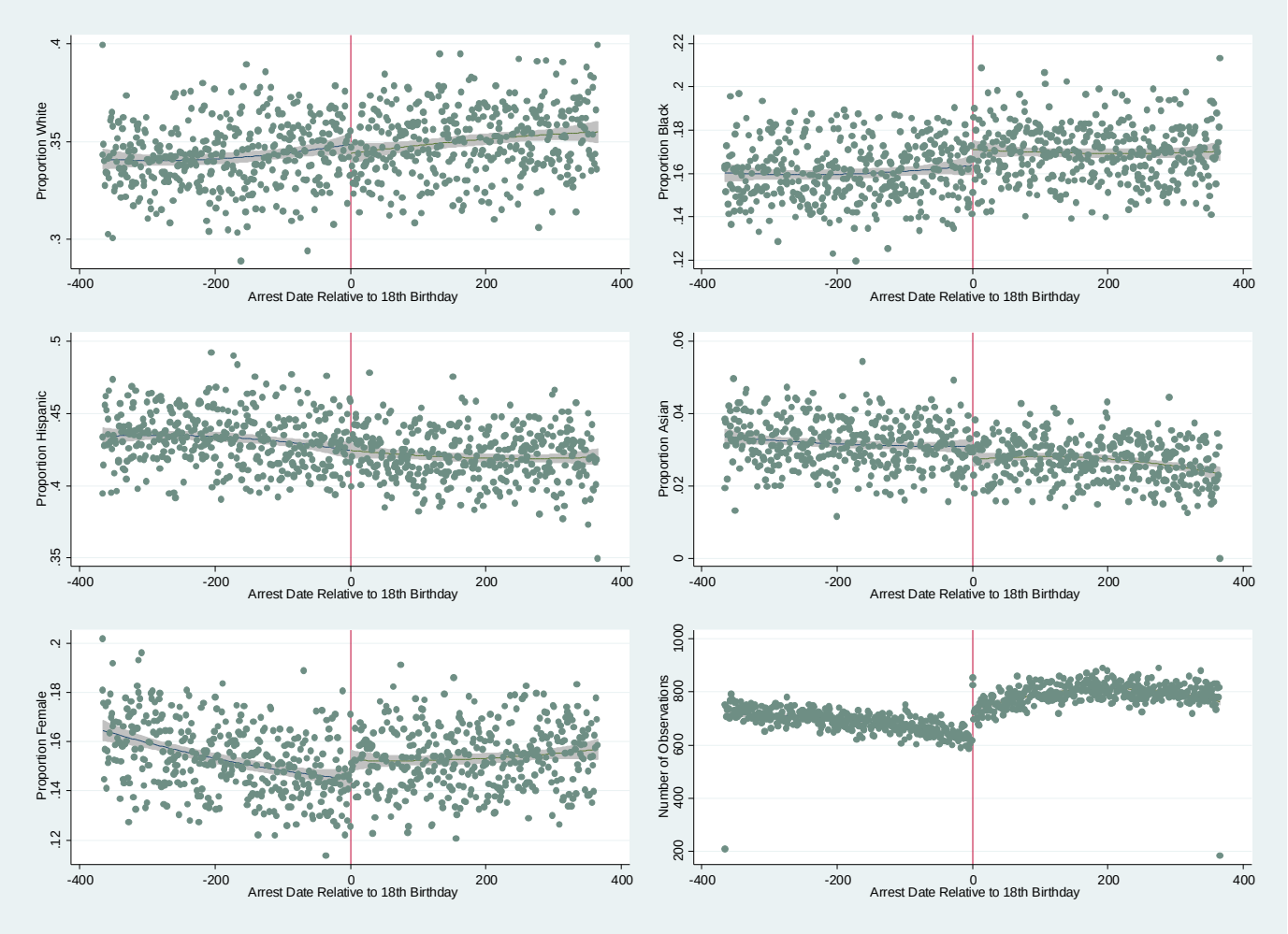
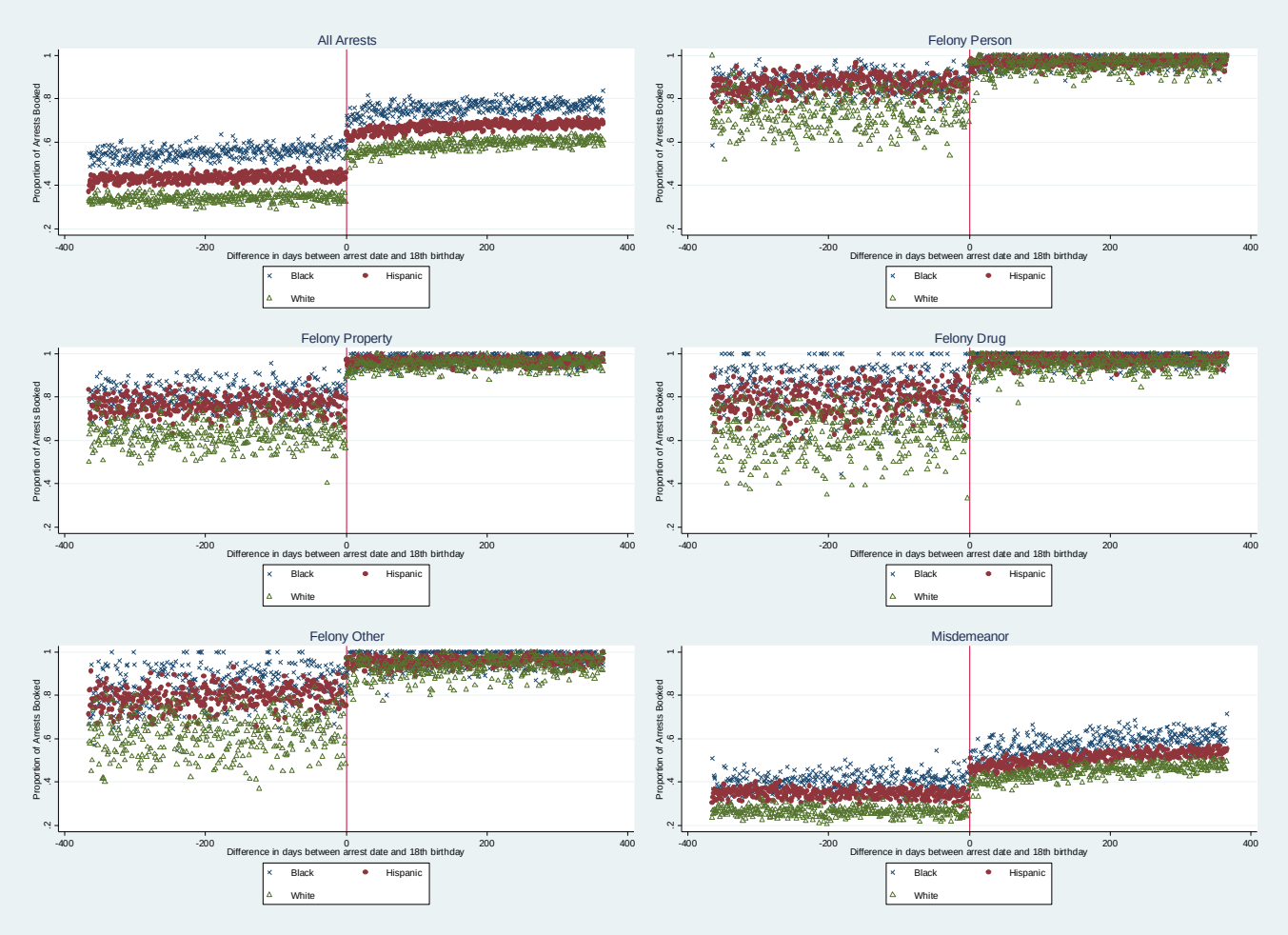
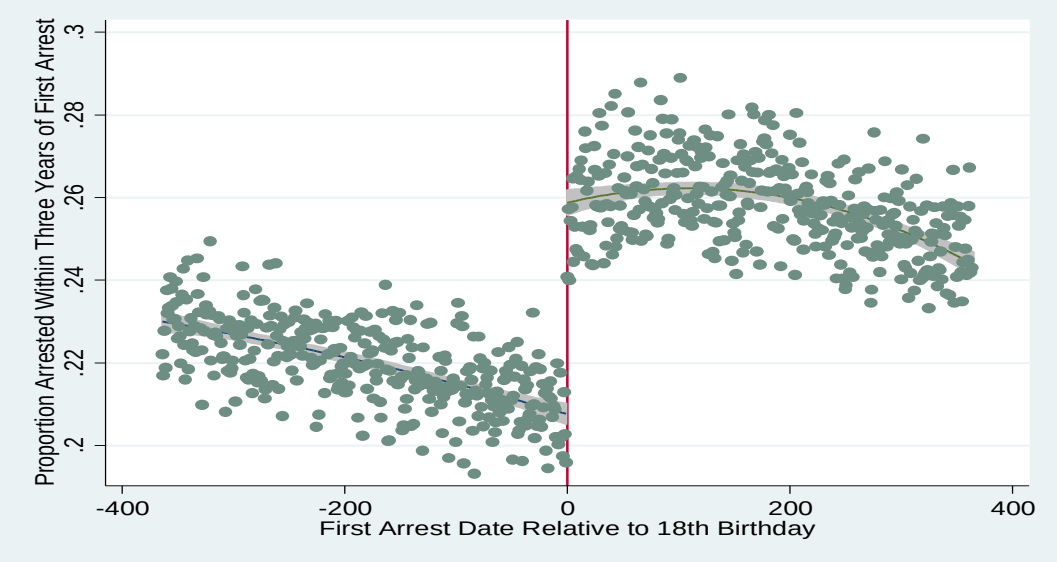


Figure 7: Proportion Booked by Race and Date of Arrest Relative to the Arrestee's Birthday for Black, White, and Hispanic Youth: All Offenses and by Broad Offense Category



Appendix Figure 1A: Likelihood of a Second Arrest within Three Years by Date of Arrest Relative to the Arrestee's Birthday



Appendix Figure 1B: Proportion Booked at First Arrest by Arrest Date Relative to 18th Birthday of the Arrestee for all Arrestee Regardless of the Number of Lifetime Arrests

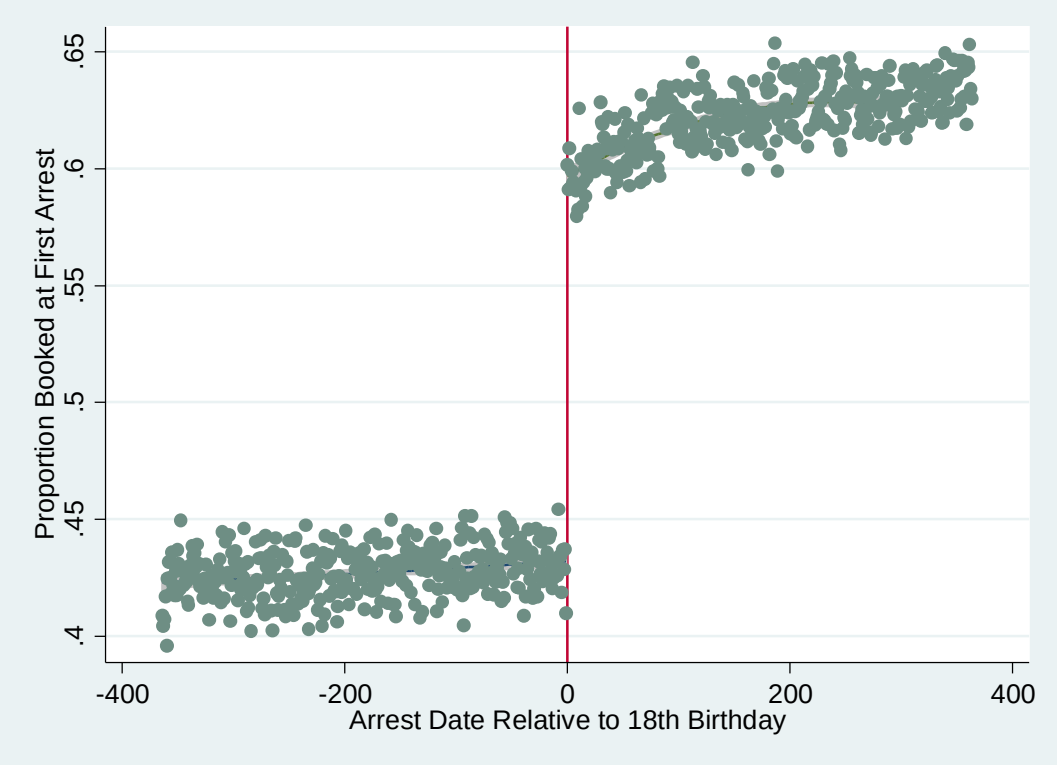


Table 1
Demographic Characteristics, Offense Type, and Arrest and Booking Histories of Juvenile Arrests by Race/Ethnicity

	White	Black	Hispanic
Age	15.04	14.81	15.01
Age at first arrest[a]	14.91	14.64	14.82
Male	0.69	0.71	0.74
Prior Bookings	0.20	0.29	0.28
Prior Arrests			
Total	0.59	0.64	0.77
Felony Person	0.03	0.08	0.05
Felony Property	0.06	0.10	0.07
Felony Drug	0.01	0.01	0.01
Felony Other	0.04	0.04	0.07
Misdemeanor	0.32	0.34	0.41
Status	0.13	0.07	0.16
Current Arrest Offense			
Felony Person	0.06	0.15	0.07
Felony Property	0.10	0.15	0.09
Felony Drug	0.03	0.02	0.02
Felony Other	0.06	0.06	0.08
Misdemeanor	0.61	0.52	0.56
Status	0.14	0.11	0.17
Arrest Offense, First Arrest[a]			
Felony Person	0.06	0.14	0.06
Felony Property	0.10	0.14	0.09
Felony Drug	0.03	0.02	0.02
Felony Other	0.06	0.05	0.08
Misdemeanor	0.63	0.54	0.58
Status	0.13	0.11	0.17
N	313,300	235,997	718,191

a. Sample restricted to observations with no observed prior arrests.

Table 2
IV Estimates of the Effect of a Prior Booking on the Likelihood that the Current Arrest is Booked Exploiting the Discontinuous Increases in Bookings Occurring at the Age of 18

Sample	Specification (1)	Specification (2)	Specification (3)
All Arrests	0.239 (0.024)[a]	0.117 (0.027)[a]	0.112 (0.026)[a]
Felony arrests	0.045 (0.017)[a]	0.055 (0.027)[b]	0.043 (0.025)[c]
Misdemeanor arrests	0.388 (0.034)[a]	0.164 (0.039)[a]	0.150 (0.036)[a]
Black	0.202 (0.065)[a]	0.110 (0.072)	0.109 (0.066)[c]
White	0.246 (0.037)[a]	0.161 (0.038)[a]	0.139 (0.036)[a]
Hispanic	0.224 (0.039)[a]	0.048 (0.051)	0.072 (0.045)
Male	0.204 (0.025)[a]	0.083 (0.028)[a]	0.075 (0.027)[a]
Female	0.460 (0.069)[a]	0.342 (0.092)[a]	0.331 (0.082)[a]

Standard errors are in parentheses. Estimates are based on a just-identified 2SLS model where the first stage includes the arrest date for the first arrest relative to the arrestees 18th birthday, the date variable squared, a dummy for over 18, interaction terms between the dummy and the quadratic function for the running variable and various additional covariates. Specification (1) only includes these variables. Specification (2) adds dummy variables for race and ethnicity, gender, the first arrest offense (roughly 76 categories), and the current arrest offense (roughly 72 categories). The final specification adds over 700 fixed effects for arresting agency.

a. Statistically significant at the one percent level of confidence.
b. Statistically significant at the five percent level of confidence.
c. Statistically significant at the ten percent level of confidence.

Table 3
Linear Probability Models Estimates of Racial/Ethnic Disparities in the Likelihood that a Juvenile Arrest is Booked

	(1)	(2)	(3)	(4)	(5)	(6)
Black	0.163[a]	0.164[a]	0.092[a]	0.088[a]	0.082[a]	0.039[a]
	(0.024)	(0.023)	(0.019)	(0.019)	(0.017)	(0.004)
Hispanic	0.061[a]	0.055[a]	0.064[a]	0.062[a]	0.058[a]	0.016[a]
	(0.018)	(0.018)	(0.015)	(0.015)	(0.014)	(0.004)
Asian	-0.019	-0.019	-0.031	-0.032	-0.027	-0.009
	(0.028)	(0.028)	(0.023)	(0.023)	(0.022)	(0.006)
Other	0.019	0.015	0.022	0.023	0.023	0.005
	(0.020)	(0.020)	(0.016)	(0.016)	(0.015)	(0.006)
Prior Arrests						
Felony Person	-	-	-	0.051[a]	-0.089[a]	0.009
				(0.007)	(0.007)	(0.006)
Felony Property	-	-	-	0.049[a]	-0.070[a]	0.013[a]
				(0.006)	(0.006)	(0.004)
Felony Drug	-	-	-	0.053[a]	-0.068[a]	0.011
				(0.007)	(0.008)	(0.008)
Felony Other	-	-	-	0.039[a]	-0.067[a]	0.008[a]
				(0.007)	(0.006)	(0.004)
Misdemeanor	-	-	-	0.002	-0.042[a]	0.007[a]
				(0.005)	(0.004)	(0.003)
Status	-	-	-	-0.011[c]	-0.017[a]	-0.007[a]
				(0.006)	(0.004)	(0.003)
Prior Bookings						
One	-	-	-	-	0.252[a]	0.087[a]
					(0.017)	(0.007)
Two	-	-	-	-	0.370[a]	0.107[a]
					(0.022)	(0.012)
Three	-	-	-	-	0.457[a]	0.107[a]
					(0.024)	(0.015)
Four +	-	-	-	-	0.608[a]	0.094[a]
					(0.033)	(0.023)
Demographics/year	No	Yes	Yes	Yes	Yes	Yes
Current Offense	No	No	Yes	Yes	Yes	Yes
Agency	No	No	No	No	No	Yes

Note: Standard errors are in parentheses and are clustered by arresting law enforcement agency. All models are estimated on 1,349,477 observations and include a constant term. "White" is the omitted race/ethnicity category. Specifications including demographic/year controls include single-year age dummies, a dummy for male, and year-of-arrest dummies. Specifications including controls for current offense include 274 fixed effects for the most serious charge. Specifications including controls for agency include 708 agency-fixed effects.

a. Statistically significant at the one percent level of confidence.
b. Statistically significant at the five percent level of confidence
c. Statistically significant at the ten percent level of confidence.

Table 4
Estimates of Racial Bookings Disparities within Broad Offense Categories

Panel A: Black-White Disparities			
	(1) Basic demographics	(2) Specification (1) plus offense and criminal history	(3) Specification (2) plus controls for arresting agency
All arrests combined	0.164[a]	0.082[a]	0.039 [a]
	(0.023)	(0.017)	(0.004)
Felony-person	0.152[a]	0.102[a]	0.043[a]
	(0.021)	(0.019)	(0.005)
Felony property	0.183[a]	0.161[a]	0.054[a]
	(0.024)	(0.020)	(0.005)
Felony drug	0.236[a]	0.186[a]	0.047[a]
	(0.030)	(0.028)	(0.013)
Felony other	0.214[a]	0.166[a]	0.065[a]
	(0.023)	(0.029)	(0.009)
Misdemeanor	0.085[a]	0.061[a]	0.034[a]
	(0.030)	(0.022)	(0.004)
Status	0.017	0.017	0.006
	(0.048)	(0.023)	(0.004)
Panel B: Hispanic-White Disparities			
	(1) Basic demographics	(2) Specification (1) plus offense and criminal history	(3) Specification (2) plus controls for arresting agency
All arrests combined	0.055[a]	0.058[a]	0.016[a]
	(0.018)	(0.014)	(0.004)
Felony-person	0.112[a]	0.077[a]	0.035[a]
	(0.023)	(0.021)	(0.004)
Felony property	0.123[a]	0.104[a]	0.036
	(0.024)	(0.021)	(0.005)
Felony drug	0.160[a]	0.134[a]	0.042[a]
	(0.036)	(0.034)	(0.007)
Felony other	0.153[a]	0.135[a]	0.051[a]
	(0.032)	(0.030)	(0.006)
Misdemeanor	0.053[a]	0.056[a]	0.009
	(0.019)	(0.016)	(0.007)
Status	-0.039[c]	-0.025[c]	-0.004
	(0.023)	(0.013)	(0.003)

Note: Standard errors are in parentheses and are clustered by agency. Each coefficient corresponds to a separate regression. The first specification includes basic demographics. The second specification adds dummies for the number of prior bookings, dummies for detailed categories of current arrest offense, and controls for the number of arrests by type. The final specification adds a complete set of dummy variables for the arresting agency.

a. Statistically significant at the one percent level of confidence.
b. Statistically significant at the five percent level of confidence.
c. Statistically significant at the ten percent level of confidence.

Table 5
Estimates of the Discontinuous Increase in Bookings Rates for White Youth at Age 18 and the Difference in this Change for Black and Hispanic Youth Relative to White Youth

Panel A: All Arrests			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.196 (0.004)[a]	0.147 (0.003)[a]	0.145 (0.003)[a]
Over 18*black	-0.039 (0.007)[a]	-0.037 (0.006)[a]	-0.042 (0.005)[a]
Over 18 *Hispanic	-0.005 (0.005)	-0.025 (0.004)[a]	-0.030 (0.004)[a]
Panel B: Arrests for a Felony Against a Person			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.173 (0.010)[a]	0.173 (0.010)[a]	0.170 (0.009)[a]
Over 18*black	-0.082 (0.013)[a]	-0.084 (0.013)[a]	-0.081 (0.012)[a]
Over 18 *Hispanic	-0.065 (0.012)[a]	-0.065 (0.012)[a]	-0.061 (0.011)[a]
Panel C: Arrests for Felony Property Offense			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.298 (0.008)[a]	0.298 (0.009)[a]	0.285 (0.007)[a]
Over 18*black	-0.138 (0.013)[a]	-0.137 (0.013)[a]	-0.122 (0.012)[a]
Over 18 *Hispanic	-0.102 (0.011)[a]	-0.102 (0.011)[a]	-0.092 (0.010)[a]
Panel D: Arrests for Felony Drug Offense			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.296 (0.011)[a]	0.295 (0.011)[a]	0.291 (0.010)[a]
Over 18*black	-0.151 (0.018)[a]	-0.149 (0.018)[a]	-0.140 (0.016)[a]
Over 18 *Hispanic	-0.134 (0.014)[a]	-0.133 (0.014)[a]	-0.124 (0.013)[a]
Panel E: Arrests for Other Felonies			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.253 (0.012)[a]	0.254 (0.012)[a]	0.250 (0.011)[a]
Over 18*black	-0.157 (0.019)[a]	-0.161 (0.019)[a]	-0.152 (0.017)[a]
Over 18 *Hispanic	-0.118 (0.014)[a]	-0.122 (0.014)[a]	-0.113 (0.013)[a]
Panel F: Misdemeanor Arrests			
	Specification (1)	Specification (2)	Specification (3)
Over 18	0.136 (0.005)[a]	0.113 (0.004)[a]	0.114 (0.004)[a]
Over 18*black	-0.029 (0.009)[a]	-0.020 (0.008)[a]	-0.033 (0.007)[a]
Over 18 *Hispanic	-0.009 (0.007)	-0.017 (0.005)[a]	-0.028 (0.005)[a]

Standard errors are in parentheses. The specification in all models is a dummy variable indicating that the arrest was booked. Specification (1) includes a running variable measuring date of arrest relative to the 18th birthday, the running variable squared, dummies for Hispanic and black, interactions between the running variable and its square and the race/ethnicity dummies, a dummy variables for being over 18 at the time of arrest, and interaction terms between black and Hispanic and being over 18. Specification (2) adds controls for gender and for arrest offense. Specification (3) adds controls for arresting agency. Each panel corresponds to separate models estimated on the indicated subset of offenses.

a. Statistically significant at the one percent level of confidence.
b. Statistically significant at the five percent level of confidence
c. Statistically significant at the ten percent level of confidence.

Table 6
Estimated Racial/Ethnic Booking Disparities for Offense Groups Defined by the White Booking Rate

Panel A: Black-White Bookings Disparities

White booking rate group	(1) Basic demographics	(2) Specification (1) plus offense and criminal history	(3) Specification (2) plus controls for arresting agency
0< x ≤ 0.1	-0.020 (0.019)	-0.001 (0.015)	0.008 (0.004)[b]
0.1< x ≤ 0.2	0.087 (0.040)[b]	0.088 (0.034)[b]	0.043 (0.006)[a]
0.2< x ≤ 0.3	0.064 (0.029)[b]	0.059 (0.027)[b]	0.032 (0.007)[a]
0.3< x ≤ 0.4	0.073 (0.036)[b]	0.057 (0.030)[c]	0.050 (0.018)[a]
0.4< x ≤ 0.5	0.110 (0.037)[a]	0.083 (0.033)[b]	0.016 (0.004)[a]
0.5< x ≤ 0.6	0.198 (0.022)[a]	0.174 (0.022)[a]	0.059 (0.008)[a]
0.6< x ≤ 0.7	0.131 (0.022)[a]	0.101 (0.020)[a]	0.038 (0.006)[a]
0.7< x ≤ 0.8	0.112 (0.020)[a]	0.079 (0.018)[a]	0.040 (0.007)[a]
0.8< x ≤ 1.0	0.027 (0.016)	0.019 (0.016)	0.016 (0.007)[b]

White booking rate group	(1) Basic demographics	(2) Specification (1) plus offense and criminal history	(3) Specification (2) plus controls for arresting agency
0< x ≤ 0.1	-0.023 (0.017)	-0.003 (0.013)	-0.000 (0.002)
0.1< x ≤ 0.2	0.049 (0.020)[b]	0.054 (0.022)[b]	0.026 (0.005)[a]
0.2< x ≤ 0.3	0.072 (0.024)[a]	0.067 (0.022)[a]	0.006 (0.004)
0.3< x ≤ 0.4	0.055 (0.023)[b]	0.045 (0.019)[b]	0.026 (0.006)[a]
0.4< x ≤ 0.5	0.084 (0.036)[b]	0.054 (0.031)[c]	0.009 (0.003)[b]
0.5< x ≤ 0.6	0.135 (0.027)[a]	0.121 (0.025)[a]	0.039 (0.004)[a]
0.6< x ≤ 0.7	0.097 (0.026)[a]	0.068 (0.023)[a]	0.030 (0.005)[a]
0.7< x ≤ 0.8	0.075 (0.020)[a]	0.057 (0.018)[a]	0.035 (0.006)[a]
0.8< x ≤ 1.0	0.003 (0.014)	-0.000 (0.013)	-0.007 (0.007)

Note: Standard errors are in parentheses. The first specification including basic demographics includes single year of age dummies, a dummy for recorded gender, and year of arrest dummies. The second specification includes the basic demographics, dummies for the number of prior bookings, dummies for detailed categories of current arrest offense, and controls for the number of arrests by type. The final specification includes all of the variables from the first two specifications plus a complete set of dummy variables for the arresting agency. Standard errors are clustered by agency. Separate models are estimated for each booking rate group.

a. Statistically significant at the one percent level of confidence.
b. Statistically significant at the five percent level of confidence.
c. Statistically significant at the ten percent level of confidence.

Table 7
Simulated Proportions of Arrested Youth Who Have Ever Been Booked Under Various Assumptions Regarding the Black-White and Hispanic-White Bookings Rates Differentials and Corresponding Simulations of the Proportion of Young Adults with Juvenile Arrest Records

Panel A: Simulations of proportion of youth arrestees ever booked			
	Black young adults	Hispanic young adults	White young adults
Base Simulation	0.55	0.46	0.37
Assuming bookings rates of white youth	0.39	0.39	0.37
Assuming closing half the difference in booking rates relative to white youth	0.47	0.42	0.37
Assuming closing a quarter of the difference in booking rates relative to white youth	0.51	0.44	0.37
Panel B: Simulations of birth cohort with a juvenile arrest record			
	Black young adults	Hispanic young adults	White young adults
Base Simulation	0.34	0.13	0.08
Assuming bookings rates of white youth	0.24	0.11	0.08
Assuming closing half the difference in booking rates relative to white youth	0.29	0.12	0.08
Assuming closing a quarter of the difference in booking rates relative to white youth	0.32	0.12	0.08

Simulations are for the youth cohorts born between 1990 and 1993. For Panel B, we generate estimates of the size of the birth cohort by estimating population totals for the non-Hispanic black, non-Hispanic white, and Hispanic population age 19 to 22 in the 2013 American Community Survey. See the details in footnotes 7 and 8 for the specifics of the ever-booked simulations.

Appendix Table A1
First-Stage and Reduced-Form Effects of Having the Arrest Date for One's First Arrest Cross the Age-18 Threshold no the Likelihood that the First Arrest is Booked and the Likelihood that the Second Arrest is Booked

	First Arrest Booked	Second Arrest Booked
Specification (1)	0.154 (0.004)	0.036 (0.004)
Specification (2)	0.147 (0.004)	0.014 (0.003)
Specification (3)	0.103 (0.003)	0.012 (0.003)
Specification (4)	0.105 (0.003)	0.012 (0.003)

Standard errors are in parentheses. All estimates are statistically significant at the one percent level of confidence. Each coefficient is the coefficient on a dummy variable indicating the first arrest occurred on or after the 18th birthday. The sample includes all individuals arrested twice between while 17 to 18 years of age from 1990 through 2014. There 540,317 observations used to estimate each model. Specification one includes a running variable measuring the arrest date for the first arrest relative to the 18th birthday in days, the running variable squared, interactions terms between the running variable quadratic function and a dummy indicating over 18, and a base effect for first arrest occurring on the 18th birthday or later. Specification (2) adds fixed effects for the most serious charge for the second offense. Specification (3) adds fixed effects for the most serious charge of the first offense. Specification (4) adds fixed effects for the law enforcement agency making the arrest.