

Race, Crime, and Police Interaction

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Abstract

This paper examines the relationship between racial disparities in poverty, arrests, crime, and police interactions. This study reviews research on racial/ethnic disparities concentrated poverty and its association with disparities in crime victimization and official police interactions. An analysis of 221 large U.S. cities in 2014-2018 examines the association between racial disparities in poverty, unemployment, and arrests. The results show that arrest rates for blacks relative to whites are significantly higher even after controlling for the level of concentrated disadvantage. Even among the cities that rank highest in concentrated disadvantage for whites, blacks on average have higher unemployment and are more likely to live below the poverty line. These findings confirm that blacks and whites on average in large U.S. cities live in largely different environmental contexts. An examination of the spatial concentration of economic disadvantage, crime, and arrest patterns in New York City, Chicago, and Los Angeles for years 2014-2019 shows that black and Hispanic monthly arrest rates are significantly higher in census block groups with greater levels of concentrated economic disadvantage. Arrest rates for whites and other groups are either negatively associated or have no relationship with the level of concentrated disadvantage. In all three cities, the level of reported crime is more strongly associated with black and Hispanic disparities in arrest rates than concentrated disadvantage. In New York and Chicago, a substantial share of disparities in black arrest rates are driven places in the top five percentiles of reported crime, and the same pattern holds for Hispanic arrest rates in Los Angeles. The results suggest high crime places located in areas with concentrated poverty help explain a significant share of black and Hispanic disparities in arrest rates. The paper concludes that investing in place-based programs that improve public safety could reduce racial disparities in police contact.

Introduction

Serious crime, poverty, and police activity are highly concentrated by place. Black Americans are on average more likely than white Americans and other groups to live in neighborhoods characterized by *concentrated disadvantage*, reflecting higher spatial concentrations of poverty, unemployment, joblessness, family disruption, and geographic isolation (Sampson & Wilson, &

Katz, 2018). Just three to five percent of places and street segments in a given city generate at least fifty percent of crime (Sherman et al., 1989; Weisburd, 2006). Racially isolated neighborhoods of concentrated disadvantage are more likely to have these hot spots of crime and police contact (Braga & Weisburd, 2010; Sampson, 2011). The substantial spatial inequality in the concentration of poverty, violent crime, and social resources connect to historic and contemporary patterns of racial residential segregation (Massey & Denton, 1993).

The number of calls for service and crime typically influences patterns of police deployment in U.S. cities. The extra-allocation of police to high crime areas is particularly evident in cities like New York that adopted the “new policing model” of linking officer assignments to crime analytics (MacDonald, Fagan, & Geller, 2016). These disparities by place are fundamentally important for thinking about who is most likely to encounter a police officer, especially in the context of highly discretionary activities like the decision to stop and question someone suspected of a crime or make an arrest.

In this paper, I examine whether concentrated disadvantage at the city and census block group level explains a significant share of the racial disparities police arrests. I review some of the empirical research on racial disparities in police stops, arrests, and use of deadly force. I discuss how spatial patterns of concentrated disadvantage may help explain a substantial share of racial disparities in the police interactions, like the decision to stop, question, and frisk someone or to make an arrest. The review focuses on published studies that examine racial disparities in stops and arrests, with some discussion of police use of deadly force. An analysis of city level data on arrests for serious crimes examines how much differences in concentrated poverty explain the gap in arrest rates for blacks relative to whites. An analysis of micro data from New York, Chicago, and Los Angeles estimates how the disparities in arrest rates for blacks and Hispanics relative to whites and other groups is accounted for by the level of concentrated poverty and reported crime between census block groups. Finally, I discuss the consequential role of historic and contemporary fractured police-minority relationships and the need for more research on testing how police can collaborate with other municipal service agencies and community groups to address problematic crime hot spots that generate a disproportionate share of arrests. An evidence-based policing model that focuses on places may help reduce racial disparities in police contact and improve public safety in the neighborhoods with the greatest levels of concentrated disadvantage in the U.S.

I. Patterns of Racial Disparities in Disadvantage and Police Contact

Racial disparities in criminal justice contact are an enduring feature of American society. Social scientists have long investigated these relationships and assessed the extent to which differential bias on the part of the police or differences in criminal offending helped account for racial disparities in criminal justice contact (Sellin, 1928; 1935; Sampson & Lauritsen, 1997). The fact that racial disparities exist in police encounters in the United State is not surprising given the historical legacy of racial segregation, inequality in income, neighborhood conditions, and serious criminal behavior (Crutchfield, 2015). Disadvantaged neighborhood conditions in particular expose African Americans to a greater risk of criminal victimization than whites and to interactions with the police (see Sampson & Lauritsen, 1997 for review). This means that even innocent bystanders are at greater risk for a police encounter in an area that has a higher rate of crime, a greater presence of police, and officers engaged in proactive police tactics.

A. Racial Disparities in Concentrated Poverty and Crime

A long history of research on racial inequalities in crime and police interactions suggests the fundamental role of place environments. Over seventy-five years ago the sociologists Shaw and McKay (1942) noted that racial and ethnic minority disparities in juvenile delinquency were largely explained by differences in neighborhood environments. The spatial concentration of reported crime and official contact with criminal justice agencies is an established fact in criminology (Sampson and Loeffler, 2010; Sherman et al., 1989; Weisburd, 2015). A number of studies suggest that disparities in poverty help account for racial disparities in criminal offending and victimization. Sampson (1987), for example, finds that a significant share of the higher homicide victimization and offending rates among blacks across US cities in the 1980s can be explaining by the consequences of higher rates of joblessness and concentrated poverty. Strom and MacDonald (2008) find that race-specific measures of concentrated poverty between cities were associated with higher black and white homicide victimization rates for youth 15 to 19 years of age in the 1980s and 1990s, and only significantly associated with black victimization rates among young adults age 20 to 24. Parker and McCall (1999) examine same race offender-victimization rates for homicides and find that black and white rates are higher in cities (1987-1991) with higher measures of concentrated poverty, but that the rates for blacks are substantially higher in cities that have higher concentrated poverty and racial segregation. These

findings line up with the work of Krivo and Peterson (1996) that finds predominately black neighborhoods with the highest rates of violent crime in Columbus, Ohio are clustered together in the same sections of the city compared to extremely poor predominately white neighborhoods. Krivo and Peterson (2006) similarly find in a study of 79 large US cities that census tracts with higher concentrations of poverty and predominately-black populations have higher rates of violent crime, associations correlated with racial residential segregation.

Importantly, the spatial inequality in concentrated poverty is stratified by race such that there are few large U.S. cities where there is a single poor majority white neighborhood that parallels the poorest majority black neighborhoods (Sampson & Wilson, 1995). In states located in the Southwestern U.S., patterns of concentrated poverty emerge for Hispanics relative to whites, but in general, the disparities in poverty, crime, and its spatial location are largest when it comes to black-white differences in large U.S. cities. Sampson, Wilson, and Katz (2018) make a strong case that racial segregation and the concentration of poverty since the 1950s has resulted in stable patterns of disadvantage for black Americans living in deep poverty. While the antecedents to these patterns are numerous, the consequence is that blacks are on average more likely than whites in the population to live in high poverty neighborhoods surrounded by other similarly poor neighborhoods, and those social ties to larger institutions of social control like schools, churches, local government services eroded. A long history of urban sociology has charted how segregating the poor into neighborhoods with high rates of joblessness creates institutional breakdowns (Wilson, 1987; Venkatesh, 2000; Sampson, 2012). Neighborhoods with a high concentration of poverty and serious street crime have fewer community organizations and connections to key city agencies that can help ensure service requests are being met (Sampson, 2012). In addition, research indicates that concentrated disadvantage and racial residential segregation is associated with reduced economic mobility. Sharkey (2008) finds in the Panel of Income Dynamics data that 55 percent of black children growing up in the poorest decile of neighborhoods remain living in the poorest decile of neighborhoods as adults, compared to 19 percent of white children growing up in the poorest decile. Chetty et al. (2014) find that income mobility is substantially lower in areas with higher levels of racial residential segregation.

B. Spatial Disadvantage and Racial Disparities in Police Contact

The spatial concentration of disadvantage is also important for helping explain some patterns in racial disparities in police contact and arrests. Sampson (1986) shows that even after controlling for self-reports of serious delinquency youth in Seattle who are black and living higher poverty neighborhoods are more likely to experience a police arrest. These findings suggest that exposure to police and discretion by place and race may condition police discretion in deciding whether to arrest a youth for a crime. Kirk (2006) found in a longitudinal sample of youth in Chicago that the probability of arrest at age seventeen was 29 percent for blacks compared to 12 percent for whites, but that black youth were significantly more likely to live in areas of concentrated poverty that were racially segregated.¹ The expected black-white disparity in arrest rates is 21 percent lower after accounting for neighborhood differences in concentrated poverty, racial segregation, and other factors. There is a considerable body of research suggesting that police deployment and interactions with citizens vary considerably by neighborhood environments. Klinger (1997) argues that the deployment of police by geography in cities exposes officers in different units to varying levels of crime and disorder. Within patrol areas, norms develop among police officers on the style of policing and their propensity to enforce the law. Research has found that police discretionary decisions to stop a suspect or make an arrest vary considerably by neighborhoods (Fagan and Davies, 2000; Gelman, Fagan, and Kiss, 2007; Smith, 1986). National estimates from the Police Public Contact Survey (PPCS) in 2015, a supplement to the National Crime Victimization Survey, find 14.55 per 1,000 black people report experiencing a street stop in the prior year compared to 9.07 for whites.² Here the data suggests that the disparities are greater for street stops than traffic stops, consistent with the fact that police deployment, crime, and poverty are highly concentrated in urban cities in racially segregated neighborhoods.

A primary challenge with research on racial disparities in police contact is establishing the benchmark for who should be at risk for a police stop and/or arrest. Ridgeway and MacDonald (2010) and Neil and Winship (2019) provide a summary of the methodological challenges with establishing who is at risk for being stopped by the police and why most approaches do not provide credible inference. Setting aside the issue of the appropriate

¹ For black youth in the sample on average 78 percent of the population of their neighborhoods were comprised of black residents. For white youth on average 49 percent of their neighborhoods were comprised of white residents.

² <https://bjs.ojp.gov/content/pub/pdf/cpp15.pdf>

benchmark for the population at risk for police stops, research shows that stop rates are higher in neighborhoods with a higher percentage of black residents, even after controlling for neighborhood levels of poverty and crime (Fagan et al, 2010; MacDonald and Braga, 2019). Fryer (2019) shows that population level black-white disparities in the ratio of stop rates declines from 4.23 to 1.43 after controlling for crime and arrest rates across police precincts in New York City, suggesting that a substantial share of the disparity in stop rates is explained by differences in crime across places. MacDonald and Braga (2019) show that in New York City the stops rates are no longer associated with the percentage of black residents in neighborhoods after the police began a series of reforms as part of a federal court settlement.

In comparison to estimates of disparities in police stops, less research on racial disparities in police arrest rates examines variation by place. Studies typically examine how concentrated disadvantage and other factors are associated with city level differences in racial disparities in police arrest rates. Parker et al. (2008), for example, find that economic disadvantage as measured by a composite measure of rates of poverty, unemployment, and educational attainment is associated with higher black and white arrest rates in large U.S. cities in 2001, though the association is larger for white rates than it is for blacks. In one of the only studies to examine how arrest rates vary by neighborhood environments, Smith (1986) finds that police were more likely to make investigatory stops and arrests in neighborhoods with greater concentrations of poverty, though the study does not control for actual reported crime in neighborhoods and relies on residents' perceptions. Smith (1986) also finds that the probability of arrest is higher for black suspects in neighborhoods with majority black populations. To my knowledge existing research has not examined how the levels of disadvantage and crime by place are associated with racial disparities in arrest rates. One likely reason is that arrest data until recently was not readily available to scholars with detailed geographic coordinates.

In terms of racial disparities in use of force by the police, there is a paucity of empirical work that examines whether poverty and the level of crime by place is associated with higher risks for blacks and Hispanics relative to whites. Fryer (2019) offers one of the most comprehensive studies and finds that blacks suspects are 46 percent more likely in a stop to have forced used than white suspects in New York City, but that this disparity is reduced to a difference of 18 percent after controlling for precinct and year. MacDonald and Braga (2019) report similar disparities in use of force in New York City after controlling for encounter and

location characteristics of stops, but that the disparities reverse by 2015 after court settlement reforms. Fryer (2019) shows in a national sample of public police contacts that black respondents are 18 percent more likely than white respondents to report having any use of force in a police interaction in the past year, and that general location and encounter-related factors do not substantially reduce the disparity. An important limitation in this analysis is insufficient base rates and location information to estimate how much racial disparities in force are associated with levels of crime and concentrated disadvantage by places.

When it comes to estimating racial disparities in police use of deadly force there are few studies that offer any assessment of the role of place-related factors. Police use of deadly force is rare relative to stops and arrests, so estimates of racial disparities in deadly force that attempt to control for location related factors are likely to be statistically underpowered. Studies have attempted in recent years to estimate disparities in officer involved shootings by comparing rates of shootings for black, Hispanic, and white suspects relative to arrests deemed at greater risk for a shooting (e.g., aggravated assault, robbery, attempted murder of a police officer). Fryer (2019), for example, finds that officers in Houston are less likely to shoot black suspects than white suspects relative to random draw of arrests for aggravated assault against a police officer, attempted murder of a police officer, resisting arrest, evading arrest, interfering in an arrest, and arrests with tasers used. Adding suspect, officer, and encounter related variables does not change the association. Fryer (2019), however, does not assess the associations between shootings and location related factors like crime or concentrated poverty. Klinger et al. (2015) attempt to assess the association between police shootings in general, concentrated poverty, crime, and the percent of black residents of neighborhoods in St. Louis.³ They find that officer involved shooting rates per neighborhoods are highest in areas with higher levels of gun violence, and that percent of black residents of neighborhoods is not associated with shooting rates. With a total of 230 officer involved shootings over 355 census block groups and a correlation of .69 between firearms violence and percent of black residents, this study is under powered to test for differences across these covariates. Legewie and Fagan (2016) provide one of the only recent city-level (n=266 cities) studies of black-white disparities in fatal police shootings (collected from crowd source data) per population or per arrests. They find a small association between city-level difference in

³ In these data over 90 percent of police shootings involved black suspects, and there is no reference group for cases that did not involve shootings, making it impossible to make any inferences about racial disparities.

the unemployment rate for blacks and the rate of black police shootings. Shooting rates are significantly higher for blacks as the share of black-on-white homicide increases, but that the same association is not significant for police shooting rates of whites. However, the difference in coefficients across models is small suggesting that the effects are not substantively different. The study does not show how the black-white disparity in police use of deadly force changes before and after including covariates. Wheeler et al. (2018) offers one of the only studies to assess racial disparities in officer-involved shootings that assesses the association with incident and place-related characteristics. The study calculates disparities in shootings (n=207) based on the rate per times an officer pulled a gun (n=1,702) and finds that black suspects are shot a lower rate per times officers drew a gun, but that neighborhood poverty, racial demographics, and violent crime rates are not associated with the probability of a shooting. However, this study is underpowered to examine location associations given that shootings occur in only 11 percent of incidents where officers pulled a gun on a suspect. Additionally, there is a clear concern that the benchmark is biased. If officers are more likely to draw guns in general on black suspects than they are on white suspects, using weapons drawn as a reference group will mechanically make the fraction of shootings for black suspects lower than it is for white suspects.⁴

C. Racial Disparities in Police Contact by Officers

Research has also focused on assessing the role that individual officer bias has in generating racial disparities in pedestrian and traffic stops. Several papers rely on methods that attempt to match officers based on work assignments and flag outlier officers whose patterns of stopping minorities differs substantially from their peers (Ridgeway and MacDonald, 2009). These methods are especially useful from a management approach to trying to reduce outliers. In some contexts where the most active officers may be generating a large share of stops of civilians, curtailing the stop activities of outlier officers may reduce population level racial

⁴ The same set of authors attempt to address this shortcoming by estimating racial disparities in weapons drawn by officers relative to all use of force incidents, finding that black suspects are less likely to have weapons drawn on them in use of force cases relative to white suspects (Worrall et al., 2020). This study, however, may have the same potential selection bias. If police officers have a lower threshold for engaging in use of force with black suspects, they can proportionally have fewer cases of drawing a weapon per force event. The study finds that the disparity between black and white suspects shrinks to being non-significant when comparing only use of force cases that result in arrest as a reference group, which suggests that selection could be a threat to the inference from their primary finding. However, the direction and size of the estimate of only arrest cases as a reference is nearly the same as when all use of force cases are a reference, suggesting that one cannot draw a conclusion about selection bias from using this subset of the data.

disparities in overall stops rates. Ba et al. (2021) find after matching officers in Chicago on month, day of week, shift, and beat that white officers are more likely to stop, arrest, and use force on black suspects (per shift) than black and Hispanic officers. In particular, white officers are more likely to arrest black suspects for misdemeanor offenses. MacDonald and Raphael (2020) find that a subset of officers influence the overall black-white disparity in search rates for traffic stops in Antelope Valley area of Los Angeles County. Weisburst (2018) finds that substantial share of the black-white disparities in who is arrested relative to calls for service in Dallas, TX is a function of individual police officers who arrive at the scene, and that white officers are more likely to arrest black suspects than Hispanic or black officers. White officers in general though have a higher propensity to make arrests, suggesting that they are targeting black suspects.

Whether outlier officers are actually engaged in racial profiling, however, cannot be determined from these studies as it is possible there are legitimate reasons not captured in data that explain officer outliers. The approach does offer a useful heuristic model for trying to minimize unnecessary racial disparities. Police commanders could, for example, ask patrol officers why their patterns of stops, arrests, and uses of force are so different from their peers and examine whether these officers are engaged in practices that have an unjustified disparate impact on minorities. Goel et al. (2016) show that a focused approach where officers first observed a suspicious object, bulge, or witnessed evidence of criminal activity before deciding to stop a suspect could mitigate racial disparities in stops for suspicion of carrying a weapon in New York City.

In other contexts where pedestrian stops are more widespread, however, it is possible that a focus on individual officer level differences will do minimal to reduce racial disparities in police contact at the population level. Policy environments, for example, where police are encouraged to engage in widespread use of stop, question, and frisk in high crime areas may generate overall racial disparities even if individual officers are all acting in near uniformity. MacDonald and Fagan (2019), for example, show that in New York City when the police designated high crime areas as “impact zones” and deployed extra officers to these areas and encouraged vigilance with stopping, questioning, and frisking crime suspects frisks of blacks and Hispanics relative to whites and other groups increased significantly.

D. Summary

In U.S. cities crime is highly correlated with the concentration of poverty, such that the two go hand in hand. A few studies suggest that street stops are disparate in the places that generate higher levels of serious crime, but few studies examine what share of the racial disparity in arrests is attributable to the environmental context of locations. Additionally, there is the potential that crime is actually a poorly used proxy by the police. Grunwald and Fagan (2019), for example, find during the height of the use of stop, question, and frisk activity in New York City there was very little correlation between an officer indicating suspicion based on the legally permissible indicator of high crime area and the actual level of crime in that area. While criminal behavior in high crime locations may influence a significant share of racial disparities in police stops, perceived suspicion based on loose heuristics of an area being high crime may produce unjustified police actions in stopping individuals. Research on racial disparities in police arrests is especially thin when it comes to understanding how much arrest rates are associated with area differences in reported criminal activity and the level of concentrated disadvantage. Focusing police activity in the highest crime street segments make sense from a crime control perspective, given that crime is highly concentrated by location (Weisburd, 2006), but we have little research that examines how much population level disparities in arrests are driven by the concentration of poverty and crime.

II. Racial Disparities in Poverty, Crime, and Police Interactions

A. Aggregate Disparities

Racial disparities in poverty, crime, and police contact are an established fact in the United States. Data from the census American Community Survey (ACS) estimates of poverty in years 2015 to 2019, for example, shows that blacks and Hispanics consistently have a higher share of the population living below the poverty level. Table 1 shows that all groups there was some improvement between 2015 and 2019, but in general blacks and Hispanics are roughly 2 to 1.8 times more likely than whites to live in poverty in the United States.

Table 1. Race/Ethnic Disparities in Percent Population Living in Poverty

Year	White	Black	Hispanic
2015	12.2%	25.4%	22.6%
2016	11.6%	23.9%	21%
2017	11.1%	23%	19.4%
2018	10.9%	22.5%	18.8%

2019	10.3%	21.2%	17.2%
Mean	11.22%	23.20%	19.80%

Source: American Community Survey, Census Bureau
<https://data.census.gov/cedsci/table?q=poverty%20status&tid=ACST1Y2015.S1701&hidePreview=true>

Separate analyses examining ACS data by county shows that blacks and Hispanics are on average about 2 times more likely than whites to live below poverty in urban counties with populations of over 500,000 people. These statistics, however, mask how much the disparity in poverty varies by geographic concentration within cities.

Table 2 shows the data from the National Crime Victimization Survey and the FBI’s Uniform Crime Reports averaged for years 2015-2019. From these descriptive data, we can compare the proportion of black, white, and Hispanics in the population to representation in race of victims of robbery and aggravated assault reported in the NCVS and arrests of suspected offenders in the UCR. Hispanics are not separately distinguished from racial categories so the percentages exceed 100% when including this group. The data show that a higher proportion of blacks are arrested for robbery and assault compared to their representation in the population or as crime victims. Hispanics and whites are arrested proportionally closer to their victimization proportions in the NCVS. While the black-white disparity is larger in arrests than victimizations, it is hard to draw strong conclusions about the sources of the disparities from these aggregate data.

Table 2. Racial Disparities in Victimization and Arrests for Robbery and Aggravated Assault, Average 2015-2019

Race/Ethnicity	Population	Robbery Victims	Robbery Arrests	Assault Victims	Assault Arrests
White	60.4%	47.3%	48.8%	59.5%	62.5%
Black	12.5%	18.8%	48.8%	13.3%	33.2%
Hispanic	18.3%	23.7%	23.1%	19.8%	24.9%

Sources: Bureau of Justice Statistics, NCVS Victimization Tool and FBI, Uniform Crime Reports, 2015-2019. Assaults represent aggravated felony assaults.

Given that most interpersonal offenses are intra-racial, the share of blacks arrested for robbery should be substantially lower if arrests are a random sample of those victimized. Data from the 2018 NCVS shows that blacks are about twice as likely to be offenders compared to their victimization percentages.⁵ The 2019 NCVS shows that around 46 percent of victims of

⁵ See <https://bjs.ojp.gov/content/pub/pdf/cv18.pdf> table 12.

non-fatal violent offenses report the offender’s race as black.⁶ These data suggest that the higher rate of arrests for blacks is likely a reflection of higher offending rates relative to their share of the population and victimizations.

A recent report from the Bureau of Justice Statistics examines the micro-data from the NCVS for 2018 and compares the race and ethnicity of offenders observed by victims, as well as those reported to the police (Beck, 2018). Here we have estimates for the race of offenders from the perspective of the victims of aggravated assault, robbery, and sexual assault, and how that compares to UCR arrest data for these same offenses. Table 3 shows that in 2018 arrest percentages for whites and blacks is closely comparable to the perceived race of reported offenders in nonfatal serious violent crimes. A higher proportion of Hispanics are arrested by the police relative to the perceived ethnicity of offenders in victimization data. A challenge with these comparisons, however, is that the race and ethnicity of the offender is what the victim perceives and may be hard for victims to determine.

Table 3. Race or Ethnicity of Offenders in NCVS and Persons Arrested for Serious Violent Crime, 2018

Race/Ethnicity	Offenders in NCVS	Offenders in NCVS Reported to Police	UCR Arrests
White	43.8%	40.9%	38.7%
Black	35.9%	42.8 %	36.1%
Hispanic	15.5%	12.0%	21.4%

The lack of disparities between reported race of offenders in the NCVS and UCR arrests, however, should not be surprising given the differences in the spatial concentration of poverty, race/ethnicity, and crime in cities.

Table 4 presents some descriptive data on racial disparities in homicides caused by firearms as reported in the FBI’s Supplementary Homicide Reports for years 2015-2019 and the Washington Post data on police shootings. Here the focus on black and white disparities, because the SHR homicide statistics across cities are not consistent in reporting the ethnicity of known offenders or victims.

⁶ <https://bjs.ojp.gov/content/pub/pdf/cv19.pdf> Table 15.

Table 4. Firearm Homicide Offending, Victimization, and Police Shootings by Race

Year	Black homicide victims	White homicide victims	Black homicide offenders	White homicide offenders	Black police shootings	White police shootings
2015	16.69	1.76	12.95	1.28	0.63	0.28
2016	18.58	1.99	13.98	1.39	0.57	0.26
2017	17.99	1.97	14.22	1.41	0.54	0.27
2018	16.95	1.84	13.84	1.42	0.55	0.26
2019	17.63	1.77	14.38	1.38	0.60	0.25
Mean	17.57	1.87	13.87	1.38	0.58	0.26

Notes: Rates per 100,000 population. Data sources; <https://github.com/washingtonpost/data-police-shootings> <https://www.ojjdp.gov/ojstatbb/ezashr/>; <https://data.census.gov/cedsci/table?d=ACS%201-Year%20Estimates%20Data%20Profiles&tid=ACSDP1Y2019.DP05>

Homicides victims and (known) offenders rates are calculated based on those killed with firearms so that the comparisons between the SHR and Washington Post data on police shootings are consistent. The Washington Post data includes only police homicides caused by firearms. For each of these data sources rates are calculates per 100,000 in the population. The population rates will be slightly off because the SHR does not cover the entire country. The mean homicide victimization rate was 17.57 per 100,000 for blacks and 1.87 per 100,000 for whites, reflecting a population level black-white disparity of 9.3. The known homicide offender rate was 13.87 for blacks and 1.38 for whites, a population level disparity of 10. The patterns show that the police shot and killed approximately .58 blacks compared .26 whites per 100,000, reflecting a population level disparity of 2.2. The patterns suggest black-white disparities for gun homicides are the greatest for homicide offenders, homicide victims, and then homicides by police.

The aggregate data indicates the black population is more likely than the white population to live in poverty, victimization rates for serious violent crime are higher for blacks relative to whites, and arrests and deadly force by the police are higher for blacks relative to their share of the population but not their share of known violent offenders. National estimates of street stops suggests population level disparities for blacks relative to whites, but it is unclear how much of these differences are reflections of racial bias by the police or differences in perceived violations or criminal behavior. Importantly, aggregate comparisons do not tell one the extent to which racial disparities in police stops, arrests, and the use of deadly force is attributable to differences in concentrated poverty and crime, individual officer bias, or policy choices made on how to deploy police and enforce criminal law violations. In the following

sections, I provide case studies that attempt to address how much the racial disparities in police stops and arrests is attributable to differences across places in crime and concentrated poverty.

B. Racial Disparities in Police Stops in New York City

Studies across multiple cities suggest that the environmental context of crime and poverty cannot fully explain racial disparities in police stop and frisk rates. Several studies on New York City have examined the rate of street stops after controlling reported crime, calls for police service, and poverty in a location and generally find rates of stops are higher in areas with higher percentages of black residents (Fagan et al., 2010; MacDonald and Braga, 2019). However, few studies examine directly how much of the disparity in stop rates by race is attributable to the level of reported crime in places. Zimroth et al. (2017) show in a report on New York City that the racial disparity in street stops closely parallels the level of reported crime in census blocks. Rather than estimating a statistical model, however, the report simply examines the ratio of stops to crimes reported and how that varies by race and ethnicity of individuals stopped. The ratios show excessive stops relative to crime in the years 2013-2014. In 2015 NYPD management curtailed its emphasis on the use of street stops to control crime, and the racial disparities ratios of stops relative to crime diminished to an insignificant level. In the following section I reproduce this approach of comparing the ratio of stops of a given race or ethnicity to the level of reported crime in a location.

Data and Measures

Stop, question, and frisk (SQF) and crime data for years 2013-2015 came from open sources.⁷ The SQF data contains information on the reason for the reported stop noted by the police officer, frisks or searches of individuals if made, and enforcement actions taken. SQF data also contains demographic information of the stopped individual. I created indicator variables measuring the race of stopped individuals according to major racial categories of black, Hispanic, and white or other groups. I focus on comparing black and Hispanic ratios of stops relative to crime compared to white and other groups. SQF and crime datasets were geocoded to the nearest census block. Over 95% of reported SQFs and crimes were successfully geocoded for

⁷ SQF data is available at:

(http://www.nyc.gov/html/nypd/html/analysis_and_planning/stop_question_and_frisk_report.shtml). Crime data is available at: (<https://data.cityofnewyork.us/Public-Safety/NYPD-Complaint-Data-Historic/qgea-i56i>)

these years to the census block. Census blocks represent blocks in the same contiguous block group and often correspond to a city block. Stops by race/ethnicity and crimes were aggregated to the level of block (month-year). The data shows there is a close connection between the location of stops and total reported crimes per month to the police. The rank order correlation shows that the total number of stops for years 2013 to 2015 are highly associated the total number of reported crimes ($r= 0.2038$; $p<.0001$; $n= 99,703$).

Results

Table 5 shows that when examined by the ratio of stops to crime the burden of stops still falls disproportionately on blacks and Hispanics. On average blacks and Hispanics are stopped at a higher rate relative to the crime reported in a given census block. However, the disparities in these ratios diminishes over time as the NYPD reduced its use of stop, question, and frisk, as is evident from the declining differences between 2013 and 2015.

Table 5. Ratio of Stops by Race to Reported Crime in NYC, 2013-2015

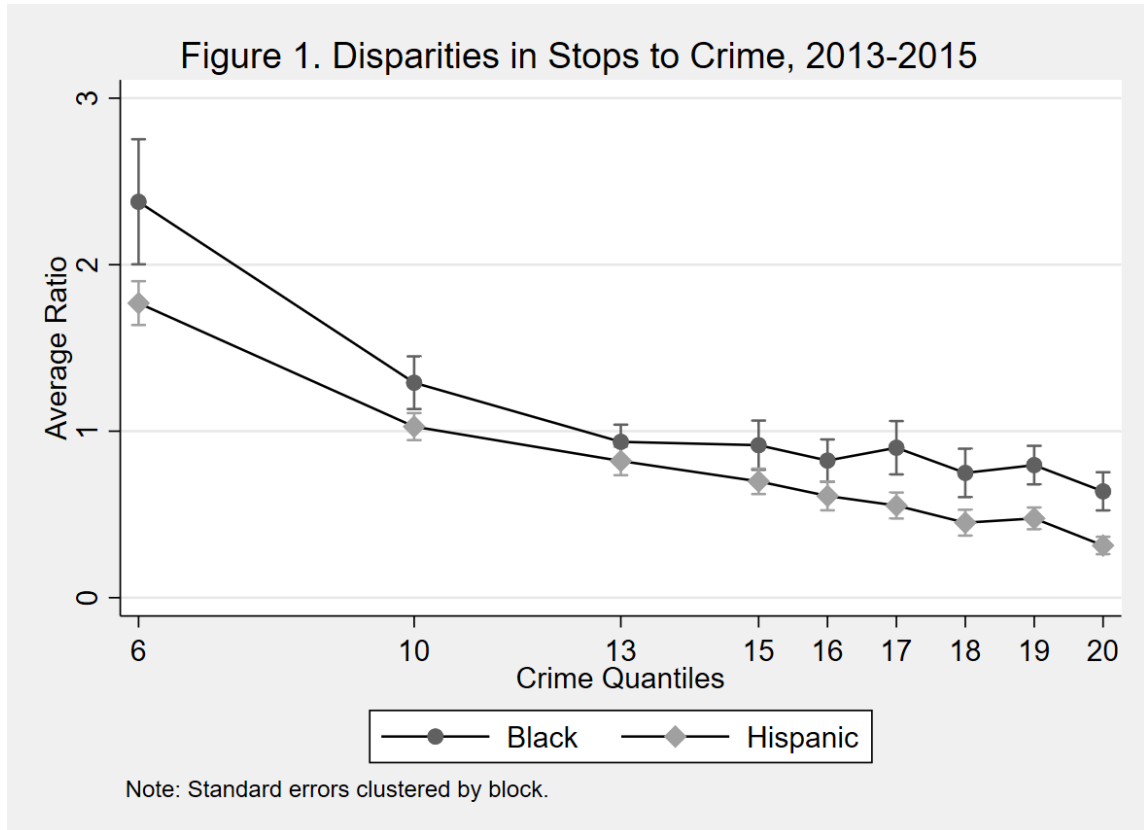
Stop to Crime	Black	White/Other	Hispanic	White/Other
2013	1.284 (.041)	.591 (.013)	.953 (.021)	.665 (.016)
Diff	.692 (.040) **		.287 (.022) **	
N=	3,267		3,253	
2014	.716 (.036)	.459 (.021)	.691 (.033)	.560 (.024)
Diff	.256 (.031) **		.130 (.029) **	
N=	566		513	
2015	.634 (.062)	.442 (.033)	.635 (.045)	.564 (.040)
Diff	.192 (.055) **		.070 (.040) **	
N=	194		214	
All Years	1.173 (.034)	.566 (.011)	.902 (.017)	.646 (.013)
Diff	.607 (.033) **		.255 (.018) **	
N=	4,027		3,890	

Note: Standard errors in parentheses.

** $p<.001$

An analysis of these patterns shows that the differences in the racial disparities in stops to crime ratios are greatest in areas with lower reported criminal offenses. Figure 1 shows the marginal estimates of these disparities from a regression model that examines differences at twenty quantiles of reported crime. One can see that the disparities in ratios between blacks and Hispanics relative to whites and others diminishes as the level of crime reported in a census block increases. This finding suggests that disparities in stops relative to crime are highest in

places with the least amount of crime reported. The findings suggest that there are racial disparities in who is committing crime in relatively low crime blocks or that police are engaged in racial profiling in deciding whom to stop and question for suspected criminal activities.



C. City Level Arrest Disparities

Given the paucity of research in recent years examining the association between racial disparities in concentrated poverty and police arrest rates, the present analysis re-examines this issue with recent data.

Data and Measures

The data for the city level analysis of arrest disparities between blacks and whites comes from the Chalfin et al. (2020) study of police force sizes, crime, and arrests in 242 U.S. cities with populations greater than 50,000 in 1980 and regularly report data to the U.S. Census Bureau Annual Survey of Government (ASG). These data combine city level measures of crime and arrests captured by the Uniform Crime Reports (UCR) system of the Federal Bureau of

Investigation. The final sample consists of 221 cities with complete data on crime and arrests for index offenses (murder, rape, robbery, aggravated assault, burglary, grand larceny, and motor vehicle theft) for blacks and whites for years 2014-2018. Index offenses measure seven felony crimes measured uniformly across cities as part of the FBI’s annual survey of crime. These data were combined with U.S. Census Bureau population for each city captured in the annual American Community Survey (ACS) (five year estimates for years 2014-2018). Race-specific measures of concentrated disadvantage for each city were measured by a standardized composite scale (mean centered at zero) of the black or white percentage of the population living below poverty, the percentage of the population unemployed, and the median household income from ACS data. Measures for population density from the ACS and the per capita public expenditures for each city from the ASG are also included. Region is measured for each city according to Federal Information Processing (fips) classifications (Northeast, Midwest, South, West).⁸

Empirical Model

The empirical model examines the extent to which race-specific measure of concentrated disadvantage are associated with yearly city level disparities in black and white arrest rates for index offenses. Rates of arrest reflect the per capita population. A Poisson regression model estimates the arrests rate per city (i) for each group (j) (blacks or whites) separately, and includes the population of blacks or whites as exposure variable. This approach converts the counts of arrests to a rate per population (black or white). The model estimated takes the following form:

$$\log\left(\frac{(\lambda_{it}^j)}{Population_{it}^j}\right) = \beta_0 + \alpha_k \%Black_{it} + \mu_k \%Hispanic_{it} + \gamma Crime\ Rate_{it} + \theta_k Concentrated\ Disadvantage_{it}^j + \sigma Population\ Density_{it} + \pi Per\ Capita\ Expenditures_{it} + \eta_r + \delta_t$$

In each model the black or white arrest rate (λ) per month is estimated assuming a Poisson distribution after controlling for crime rates (reported index offenses), the race/ethnicity percentages of the population (% Black, % Hispanic, % Other), per capita public expenditures,

⁸ <https://www.census.gov/geographies/reference-files/2020/demo/popest/2020-fips.html>

and the level of black or white concentrated disadvantage, region, and year. Concentrated disadvantage, percent black of population, and percent Hispanic of population are estimated according to set of dummy variables capturing three quantiles (k) of their respective distributions (0-33, 33-66, and 66-100 percentiles). The terms (η) and (δ) refer to region (r) and year (t) fixed effects. Standard errors are clustered at the city-level to correct for over-dispersion and unmeasured dependence within cities (Wooldridge, 2010).

Results

Descriptive Statistics

Table 6 reports summary statistics for black and white arrests for index offenses and key control variables. The unit of analysis is the city-year for 2014-2018. Blacks on average represent 45.27% of arrests compared to 19.58% of the population. Among individuals living in these cities blacks are more likely than whites to be unemployed (16.72% black, 8.8% white) and living below poverty (30.36% black, 17.09% white).

Table 6. Descriptive Data on 221 Large US Cities

	Mean	SD	Min	Max	N=
Index Arrests, Black	874.66	1512.98	10	15831	1066
Index Arrests, White	1057.35	1533.58	12	13900	1066
Population	272935.5	417433.5	48513	3862210	1066
Population Density	5055.53	5041.69	711.10	53015.42	1066
Percent White	48.60	21.37	2.24	90.05	1066
Percent Black	19.58	18.32	.28	87.12	1066
Percent Hispanic	21.81	19.68	1.48	95.58	1066
Percent White Unemployed	8.80	2.985	3.53	21.09	1066
Percent Black Unemployed	16.72	5.19	0	31.29	1066
Percent Hispanic Unemployed	11.63	4.44	2.28	26.5	1066
Median Household Income	34332.4	10510.4	17688	92048	1066
Percent White Poverty	17.09	6.17	5.26	38.92	1066
Percent Black Poverty	30.36	9.84	3.32	65.95	1066
Crime Rate	4374.90	1756.86	923.22	12910.73	1066
Per Capita Public Expenditures	3435.31	2028.08	745.54	17610.15	1055

Table 7 presents the results from the estimates of the association between the black arrest rates in each city before (1) and after including measures of concentrated disadvantage (2) and crime (3). Cities that rank higher in the proportion of black population have a significantly lower black arrest rate. Column 1 shows that black arrest rate declines by approximately 27.7 and 36.7

percent for cities that are in the second and third quantile relative to the first quantile. The reductions in black arrest rates by share of the black population does not changes substantively after controlling for concentrated disadvantage (2) or concentrated disadvantage and crime (3). Table 7 also shows that the black arrest rate for index offenses is 31.5 percent higher in cities that rank in the top quantile of black concentrated disadvantage, even after controlling for the crime rate (3).

Table 7. City Level Index Arrest Rates for Black, 2014-2018.

	(1)	(2)	(3)
	Index Arrests Black	Index Arrests, Black	Index Arrests, Black
Quantiles % Black=2	0.723** (0.0746)	0.713** (0.0745)	0.726** (0.0793)
Quantiles % Black=3	0.633** (0.104)	0.609** (0.0981)	0.615** (0.102)
Quantiles % White=2	1.269* (0.122)	1.395** (0.132)	1.411** (0.134)
Quantiles % White=3	1.585* (0.320)	1.750** (0.295)	1.791** (0.306)
Quantiles % Hispanic=2	1.185 (0.139)	1.244 (0.146)	1.245 (0.147)
Quantiles % Hispanic=3	1.002 (0.166)	1.063 (0.164)	1.097 (0.171)
Expenditures per 1,000	1.000 (0.0000182)	1.000 (0.0000185)	1.000 (0.0000194)
Population density	1.000 (0.0000147)	1.000 (0.0000142)	1.000 (0.0000147)
Year=2015	0.938** (0.0167)	0.935** (0.0170)	0.938** (0.0163)
Year=2016	0.876** (0.0192)	0.872** (0.0195)	0.872** (0.0190)
Year=2017	0.852** (0.0236)	0.849** (0.0235)	0.850** (0.0228)
Year=2018	0.876** (0.0379)	0.872** (0.0360)	0.877** (0.0351)
Midwest	1.029 (0.141)	1.006 (0.118)	0.971 (0.117)
South	1.128 (0.148)	1.304* (0.172)	1.246 (0.170)
West	1.361** (0.151)	1.547** (0.181)	1.483** (0.180)
Disadvantage, Black=2		1.046 (0.0941)	1.024 (0.0912)
Disadvantage, Black=3		1.362**	1.315*

		(0.156)	(0.148)
Crime rate			1.000
			(0.0000201)
Observations	1055	1055	1055

Exponentiated coefficients (Incidence Rate Ratio); Standard errors in parentheses; Reference groups are 1st (0-33 percentile) for Quantiles, 2014 for year, and Northeast for region. Concentrated Disadvantage represents average of percentage of blacks in poverty, percentage of unemployed, and median household income.

* $p < .05$, ** $p < 0.01$

Table 8 presents the results from the estimates of the white arrest rate in each city before (1) and after including measures of concentrated disadvantage (2) and crime (3). Cities that rank higher in the proportion of black population have a significantly lower white arrest rates. Column 1 shows that white arrest rate declines by approximately 22.2 and 37.3 percent for cities that are in the second and third quantile relative to the first (0-33 percentile) in percentage of black residential population (3). The lower white arrest rate in cities with a majority black population closely mirrors the lower black arrest rate. Table 8 also shows that the white arrest rate for index offenses is 54.8% higher in cities that rank in the top quantile of white concentrated disadvantage, even after controlling for the crime rate (3).

Table 8. City Level Index Arrest Rate for White, 2014-2018.

	(1)	(2)	(3)
	Index arrests, White	Index arrests, White	Index arrests, White
Quantiles % Black=2	0.787*	0.768**	0.778**
	(0.0750)	(0.0690)	(0.0736)
Quantiles % Black=3	0.671**	0.637**	0.627**
	(0.0951)	(0.0873)	(0.0865)
Quantiles % White=2	0.732**	0.837*	0.818*
	(0.0803)	(0.0710)	(0.0688)
Quantiles % White=3	0.784	0.875	0.863
	(0.112)	(0.114)	(0.114)
Quantiles % Hispanic=2	1.225*	1.197	1.215
	(0.125)	(0.121)	(0.124)
Quantiles % Hispanic=3	1.517**	1.430**	1.506**
	(0.204)	(0.197)	(0.208)
Expenditures per 1,000	1.000	1.000	1.000
	(0.0000263)	(0.0000256)	(0.0000258)
Population density	1.000*	1.000	1.000
	(0.0000183)	(0.0000183)	(0.0000182)
Year=2015	0.956**	0.953**	0.952**
	(0.0114)	(0.0115)	(0.0106)

Year=2016	0.888** (0.0219)	0.884** (0.0224)	0.879** (0.0215)
Year=2017	0.807** (0.0231)	0.803** (0.0234)	0.801** (0.0221)
Year=2018	0.769** (0.0247)	0.766** (0.0250)	0.774** (0.0240)
Midwest	0.729** (0.0832)	0.837 (0.0978)	0.777* (0.0939)
South	0.994 (0.138)	1.318 (0.197)	1.183 (0.198)
West	1.106 (0.122)	1.342** (0.140)	1.216 (0.143)
Disadvantage, White=2		1.259** (0.109)	1.181* (0.0960)
Disadvantage, White=3		1.668** (0.186)	1.548** (0.180)
Crime rate			1.000* (0.0000254)
	1055	1055	1055

Exponentiated coefficients (Incidence Rate Ratio); Standard errors in parentheses; Reference groups are 1st (0-33 percentile) for quantiles, 2014 for year, and Northeast for region. Concentrated Disadvantage represents average of percentage of whites living below poverty, percentage unemployed, and median household income.

* $p < .05$, ** $p < 0.01$

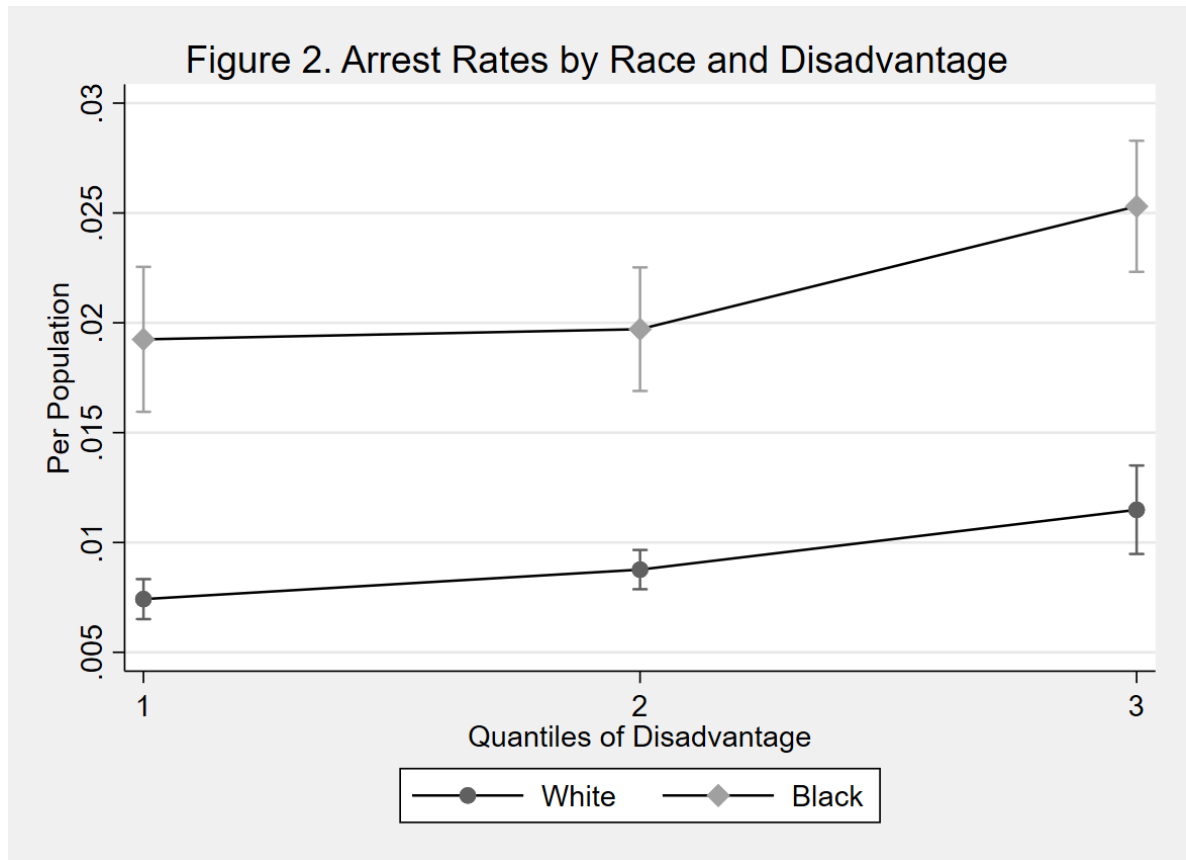


Figure 2 shows the expected black and white arrest rates from the models estimated in Tables 7 and 8 (column 3) by level of concentrated disadvantage. The black arrest rate is significantly higher than the white arrest rate at every level of concentrated disadvantage. These findings highlight that the racial disparity in arrests is not simply a function of city level differences in poverty, unemployment, and median household income. In even the most economically disadvantaged cities for the white population the level of unemployment and poverty is considerably lower than it is for the black population. Specifically, for cities that rank in the top quantile of white concentrated disadvantaged the unemployment percentage is 11.59 for the white population compared to 19.74 for the black population. In this top quantile of white concentrated disadvantage 23.4 percent of the white population lives below the poverty line compared 34 percent for the black population. Flint, MI, Detroit, MI, Pontiac, MI, Camden, NJ, and Reading, PA rank in the top five of cities with the highest level of concentrated disadvantage for the white population. In these five cities, the percentage of the white population that is unemployed or living below the poverty line is considerably lower than it is for the black

population. Detroit, MI and Camden, NJ are the only two cities where the percentage of the population living below poverty that is white is comparable that for blacks. However, in both of these cities less than ten percent of the population is white. There are simply no large US cities where on average blacks and whites live in comparable levels of poverty and unemployment.⁹

The level of disadvantage in employment and poverty at the city level is considerably greater for blacks relative to whites in all cities, regardless of where they rank in terms of race-specific measures of poverty and unemployment. These descriptive comparisons underscore one potential explanation for why the arrest rates for index offenses for the black relative to white population is considerably higher at every level of concentrated disadvantage between cities.

D. Analysis of Arrests in New York, Chicago, and Los Angeles

Given the lack of comparable levels of poverty and unemployment for blacks and whites in the population across cities, it is important to examine how much of the variation in racial disparities in arrest rates is attributable to variation in economic disadvantage and levels of crime at a more micro level. Research consistently finds that poverty, race, and crime are highly concentrated in cities. New York City, Chicago, and Los Angeles all provide open sources for the locations of crimes and arrests, which allow one to link these data to location specific measures of household economic data from the American Community Survey (ACS). New York and Los Angeles also provide demographic information on victims, permitting an analysis of the race/ethnicity of the victims among the total count of crime in locations. This analysis helps assess how much neighborhood differences within cities in concentrated disadvantage and crime account for racial disparities in arrests.

Data and Measures

In each city the location of arrest, crime, and demographic data from the American Community Survey's (Five Year Estimates) (ACS) are linked to the corresponding census block group for years 2014-2019 from open sources.¹⁰ From the crime and arrest datasets, counts were

⁹ Palo Alto, CA is the only of 221 cities that has a lower percentage of the Black population living in poverty (3.3%) compared to Whites (5.4%). This is most likely a reflection of Stanford University students living permanently in the city. Blacks represent only 1.5% of the population of Palo Alto, CA.

¹⁰ Crime data from New York (<https://data.cityofnewyork.us/Public-Safety/NYPD-Complaint-Data-Historic/qgea-i56i>), Chicago (<https://data.cityofchicago.org/Public-Safety/Crimes-2001-to-Present/ijzp-q8t2>), and Los Angeles (<https://data.lacity.org/Public-Safety/Crime-Data-from-2010-to-2019/63jg-8b9z>). Arrest data from New York

generated of the monthly number of black, Hispanic, white or other groups of arrestees and victims (New York and Los Angeles) per census block group. For the primary analysis, the focus is on comparing counts for blacks and Hispanics versus whites and other groups. Census data on the residential population were extracted from ACS 5-year estimates available at Social Explorer.¹¹ Census block groups are the primary unit of analyses because they represent blocks in the same census tract and are the smallest population enumeration in the census. To measure demographic makeup of the residential population, measures of the percent of the residential population that was black, percent Hispanic, and percent other races were calculated. Economic characteristics of the residential population were measured the percentage of the population under 18 years of age, percentage female headed households, percentage of families in the population living below poverty line, median household income, and the percentage of vacant houses. These measured were standardized into composite scale (mean centered at zero) capturing concentrated disadvantage. In each city census block groups were also linked to regional measures (borough for New York City, wards for Chicago, and police divisions for Los Angeles) to control for larger spatial patterns in arrests.¹²

Empirical Model

The empirical model estimates how the extent to which differences in crime, victimization by race, and concentrated disadvantage explains monthly census block group-level differences in arrests of blacks, Hispanics, and whites and other groups. Arrests reflect the per monthly (m) block group (i) count. A Poisson regression model estimates the arrests rate for each group (j) (blacks, Hispanics, or white/others). The model estimated takes the following form:

$$\log(\lambda_{imt}^j) = \beta_0 + \theta \text{Concentrated Disadvantage}_{imt} + \gamma \text{Crime Rate}_{imt} + \eta_r + \delta_t$$

(<https://data.cityofnewyork.us/Public-Safety/NYPD-Arrests-Data-Historic-/8h9b-rp9u>), Chicago (<https://data.cityofchicago.org/Public-Safety/Arrests/dpt3-jri9>), and Los Angeles (<https://data.lacity.org/Public-Safety/Arrest-Data-from-2010-to-2019/yru6-6re4>).

¹¹ Census data for the ACS obtained from Social Explorer (<https://www.socialexplorer.com/explore-tables>).

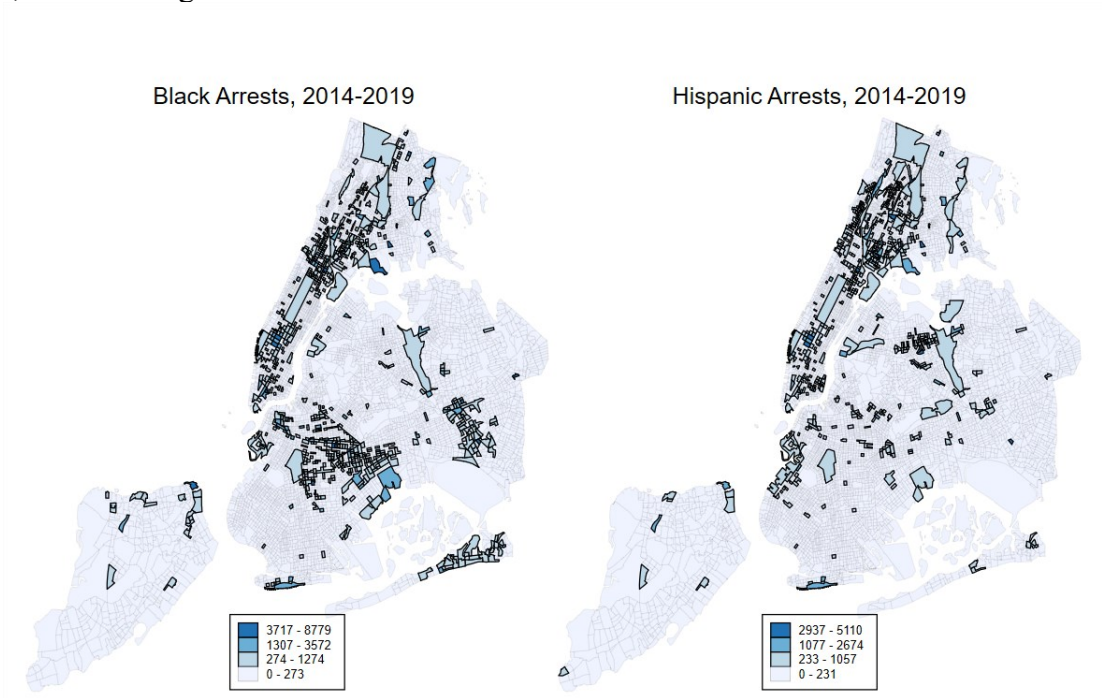
¹² Each model also includes clustered standard errors at the block group level to control for unmeasured dependence within blocks over time.

In each model, the black or white arrest rate per block group (i) is estimated controlling for concentrated disadvantage and number of crimes or victims of the same race/ethnicity in a given month. The terms (η) and (δ) refer to region (r) and year (t) fixed effects. For New York City, Chicago, and Los Angeles regions are defined by the Borough, Ward, or LAPD Division in which the census block group is located. Standard errors are clustered at the block group to correct for over-dispersion and unmeasured dependence within cities (Wooldridge, 2010).

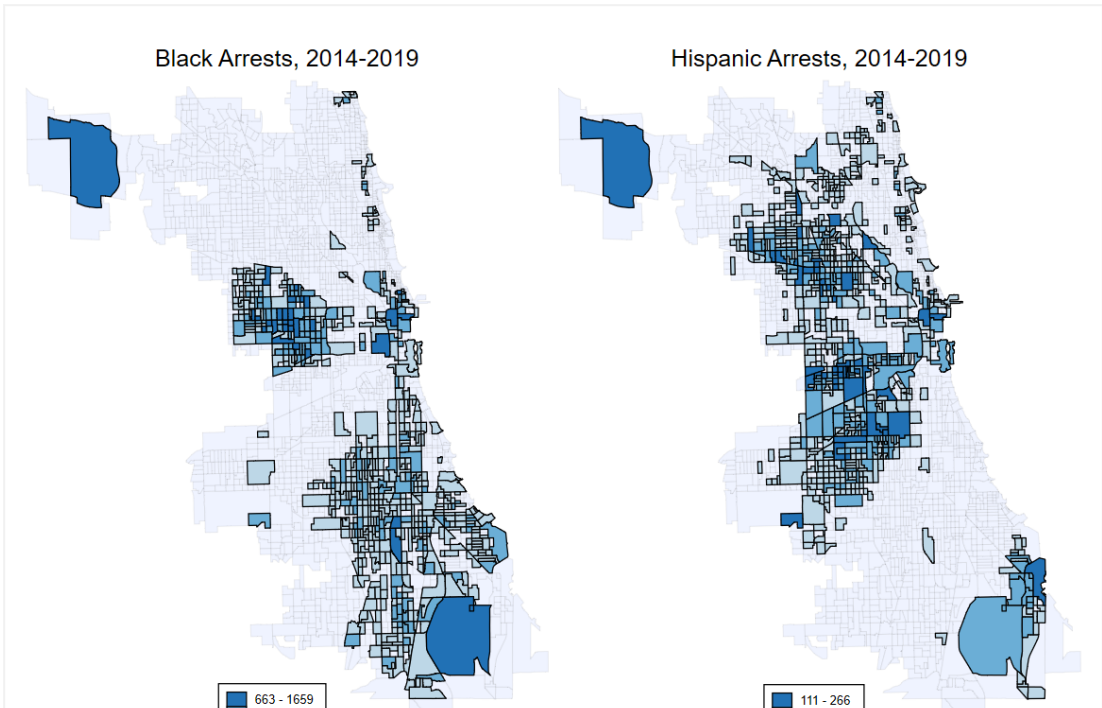
Results

Figure 3 shows the basic spatial pattern of arrests per census block group for black and Hispanic arrestees for years 2014-2019 for New York, Chicago, and Los Angeles. The figure shows that there is some spatial concentration in arrest patterns across each city. Spearman rank order correlations also indicates that arrest rates for blacks and Hispanics in each city are associated with the percentage of the population of the same race and ethnicity, number of reported criminal offenses, and the level of concentrated disadvantage.

Figure 3. Spatial Concentration of Arrests of Blacks and Hispanics 2014-2019, New York, Chicago, and Los Angeles



Source: Open NYC Data



Source: Open Chicago Data

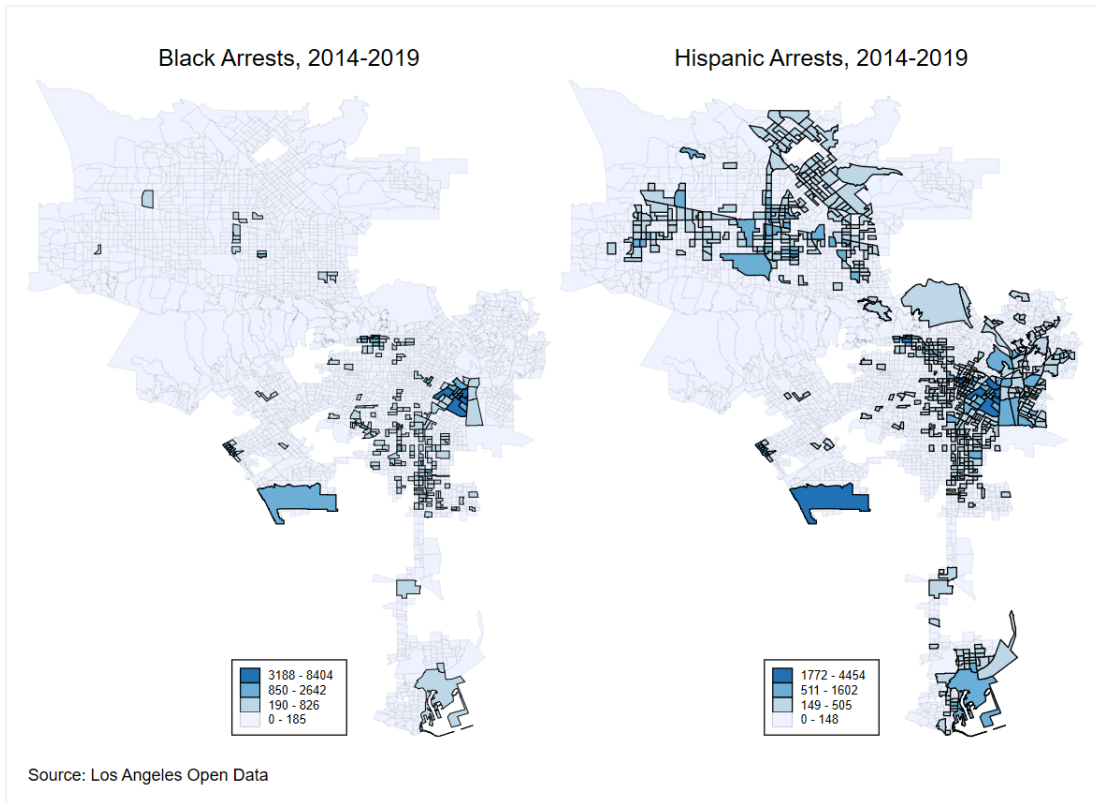


Table 9 examines the spatial concentration of arrests, crime, demographics of residential population, and concentrated disadvantage in each city using the Moran’s I statistic.¹³ The level of spatial concentration of arrests for blacks and Hispanics is the highest in Chicago, which may be a consequence of a higher spatial uniformity of crime and residential segregation for black residents.

Table 9: Spatial Concentration of Arrests, Crime, and Concentrated Poverty

Measure	New York (n=6,291)	Chicago (n=2,299)	Los Angeles (n=2,579)
Black arrests	.073**	.319**	.224**
Hispanic arrests	.079**	.349**	.162**
Crime	.136**	.220**	.104**
Percent Black Residents	.609**	.700**	.559**
Percent Hispanic Residents	.594**	.583**	.553**
Concentrated Disadvantage	.531**	.556**	.541**

¹³ Moran’s I was calculated based on a power function of $-distance^2$ (kilometers) between focal census block group (i) and other block groups (j).

While more variability of arrests and crime per block group means there will be mechanically less spatial autocorrelation, when Moran's I is estimated after normalizing data to quantiles there remains less spatial association in arrests and crime than between race and ethnicity of residential population or concentrated disadvantage. The hyper-concentration of arrests and crime means that a small fraction of census blocks in each city produce an outsized contribution and there is less uniform distribution by sections of each city than there is in poverty and demographics of neighborhoods.

Table 10 shows summary statistics for the total counts of arrests, crime, victimization, and concentrated disadvantage in each city. One can rely on this table to get a sense of the racial and ethnic disparity in arrests and victimizations. In New York City the black arrest rate is the highest among all groups, representing 48 percent of arrests. In comparison, black residents make up roughly 24 percent of the population and crime victims. Hispanics represent roughly 34 percent of arrests compared to 28 percent of the population and 24 percent of victims of reported crimes. In Chicago the black arrest rate is on average 80.79 per census block group, reflecting approximately 74 percent of arrests compared to 35 percent of the residential population. Hispanics represent approximately 17 percent of arrests in Chicago compared to 25.6 percent of the residential population. Chicago does not post data on the race or ethnicity of victims of reported crime incidents. In Los Angeles, the arrest rates are highest for Hispanics, averaging 123 per census block group and representing approximately 46 percent of arrests compared to 46 percent of the residential population and 34 percent of crime victims. The black arrest rate is lower than Hispanics in Los Angeles and represents approximately 29 percent of arrests, compared to an average residential population of 10 percent and 15.5 percent of crime victims.

These descriptive data clearly show that blacks are over represented in arrests relative to their share of the population and victims in New York and Los Angeles. In Chicago the arrest rate for blacks is higher than the share of the black residential the population. In New York Hispanics are over represented in arrests relative to their share of the population and victims; whereas they are under represented relative to their share of the population in Chicago. In Los Angeles the arrest rates are highest for Hispanics but they are proportional to their share of the residential population.

Table 10: Summary Statistics for 2014-2019

New York	Mean	SD	Min	Max	Count
Black arrests	136.003	398.970	0	8779	6291
Hispanic arrests	96.549	271.729	0	5110	6291
White/Other arrests	51.894	161.628	0	3939	6291
Offenses	451.609	554.828	0	13791	6291
Black victims	111.0029	160.7375	0	1587	6291
Hispanic victims	91.7355	123.1867	0	1659	6291
White/Other victims	248.8697	387.1179	0	12028	6291
Percent Black	.2411	.295	0	1	6222
Percent Hispanic	.2787	.250	0	1	6222
Percent White	.438	.309	0	1	6222
Disadvantage	-.049	1.753	-5.301	5.837	5816
Chicago	Mean	SD	Min	Max	Count
Black arrests	80.791	147.533	0	1659	2299
Hispanic arrests	17.721	28.406	0	266	2299
White/Other arrests	10.552	21.254	0	400	2299
Offenses	689.883	779.048	1	19300	2299
Proportion Black	.3504	.406	0	1	2289
Proportion Hispanic	.259	.298	0	1	2289
Proportion White	.471	.346	0	1	2289
Disadvantage	-.067	1.710	-4.654	5.539	2191
Los Angeles	Mean	SD	Min	Max	Count
Black arrests	76.739	288.408	0	8404	2579
Hispanic arrests	123.180	232.180	0	4454	2579
White/Other arrests	65.087	192.912	0	3127	2579
Offenses	506.936	564.975	0	13201	2759
Black victims	78.607	147.70	0	2419	2579
Hispanic victims	172.284	204.296	0	4638	2579
White/Other victims	256.04	322.100	0	6144	2579
Proportion Black	.1002	.158	0	1	2572
Proportion Hispanic	.464	.3002	0	1	2572
Proportion White	.534	.232	0	1	2572
Disadvantage	-.041	1.789	-4.362	6.594	2496

Table 11 presents the results from the regressions estimating the rate of arrest for blacks, Hispanics, and whites and other groups per census block group month. The table shows both the estimates and the adjusted average rate of arrests. The first (1) column shows that unadjusted average rate of arrests per group. Columns (2) to (5) show adjusted rates of arrest after conditioning on region and year fixed effects, concentrated disadvantage, number of criminal offenses, and number of victims of the same race or ethnic group.

The results for New York show that the black and Hispanic rate of arrests is 2.05 and 1.45 per month and is 20 to 29 percent lower after controlling for concentrated disadvantage

and crime or same race/ethnicity of victims reported in each census block group. The white arrest rate of 0.78 and is approximately 16 percent lower after controlling for concentrated disadvantage and crime or same race victims of crime. A comparison of regression coefficients across models (Clogg et al., 1995) that adjusts covariance for clustering standard errors on block groups (White, 1982), shows that the estimate of concentrated disadvantage is significantly larger for the black (Chi-square (1) 237.23, $p < .001$) and Hispanic (Chi-square (1) 341.86; $p < .001$) arrest rates compared to white and other group arrest rates. For all groups the number of victims of the same race or ethnicity is substantially associated with the arrest rate, though the size of the association is significantly larger for black and Hispanic arrest rates than white and other groups.

The results for Chicago show a black arrest rate of 1.20 per month and is 63 percent lower (.448) after controlling for concentrated disadvantage and the crime rate of census block groups. The relationship between concentrated disadvantage appears to be a major driver of a lowering of the expected black arrest rate. Concentrated disadvantage also has a significantly larger association (Chi-square (1)105.3; $p < .001$) with black arrest rates than it does with white and other groups and a somewhat larger association than for Hispanics (Chi-square (1) 3.68; $p = .055$). Levels of crime are associated with higher arrest rates for all groups, and the size of the association is only slightly larger for black and Hispanic rates relative to white arrest rates.

Table 11: Rate of Arrests for Black, Hispanic, and White or Other Groups

	(1)	(2)	(3)	(4)	(5)
<i>New York</i>	Black	Black	Black	Black	Black
Disadvantage			1.192** (0.00334)	1.226** (0.0228)	1.052** (0.0163)
Criminal Offenses				1.030** (0.00308)	
Black victims					1.199** (0.00578)
Average rate	2.050	1.904	1.805	1.630	1.462
Observations	417427	417390	387188	381527	381527
	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.216** (0.00305)	1.241** (0.0221)	1.094** (0.0195)
Criminal offenses				1.029** (0.00301)	
Hispanic victims					1.197** (0.0115)

Average rate	1.455	1.273	1.198	1.098	1.070
Observations	417427	417390	387188	381527	381527
	White/Other	White/Other	White/Other	White/Other	White/Other
Disadvantage			0.925** (0.00296)	0.941** (0.0188)	0.963 (0.0192)
Crime offenses				1.027** (0.00296)	
White/other victims					1.030** (0.00359)
Average rate	0.782	0.696	0.699	0.657	0.667
Observations	417427	417390	387188	381527	381527
<i>Chicago</i>	Black	Black	Black	Black	Black
Disadvantage			1.253** (0.0241)	1.213** (0.0201)	
Criminal Offenses				1.016** (0.00252)	
Average rate	1.201	0.512	0.460	0.448	
Observations	154604	154595	147277	147277	
	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.188** (0.0257)	1.160** (0.0234)	
Criminal offenses				1.015** (0.00241)	
Average rate	0.264	0.133	0.132	0.129	
Observations	154604	154595	147277	147277	
	White/Other	White/Other	White/Other	White/Other	White/Other
Disadvantage			1.009 (0.0266)	0.979 (0.0224)	
Crime offenses				1.013** (0.00208)	
Average rate	0.157	0.0905	0.0906	0.0894	
Observations	154604	154595	147277	147277	
<i>Los Angeles</i>	Black	Black	Black	Black	Black
Disadvantage			1.056 (0.0635)	1.120 (0.0659)	1.068 (0.0486)
Criminal Offenses				1.016** (0.00384)	
Black victims					1.082** (0.0140)
Average rate	1.550	0.911	0.874	0.866	0.865
Observations	127701	127701	123865	121328	121328
	Hispanic	Hispanic	Hispanic	Hispanic	Hispanic
Disadvantage			1.198** (0.0346)	1.236** (0.0299)	1.204** (0.0299)
Criminal offenses				1.019** (0.00365)	

Hispanic victims					1.055** (0.0100)
Average rate	2.488	2.200	2.119	2.077	2.072
Observations	127701	127701	123865	121328	121328
	White/Other	White/Other	White/Other	White/Other	White/Other
Disadvantage			0.929 (0.0416)	0.955 (0.0397)	0.976 (0.0380)
Crime offenses				1.020** (0.00385)	
White/other victims					1.040** (0.00587)
Average rate	1.314	0.855	0.840	0.826	0.820
Observations	127701	127701	123865	121328	121328
Year fixed effects	No	Yes	Yes	Yes	Yes
Region fixed effects	No	Yes	Yes	Yes	Yes

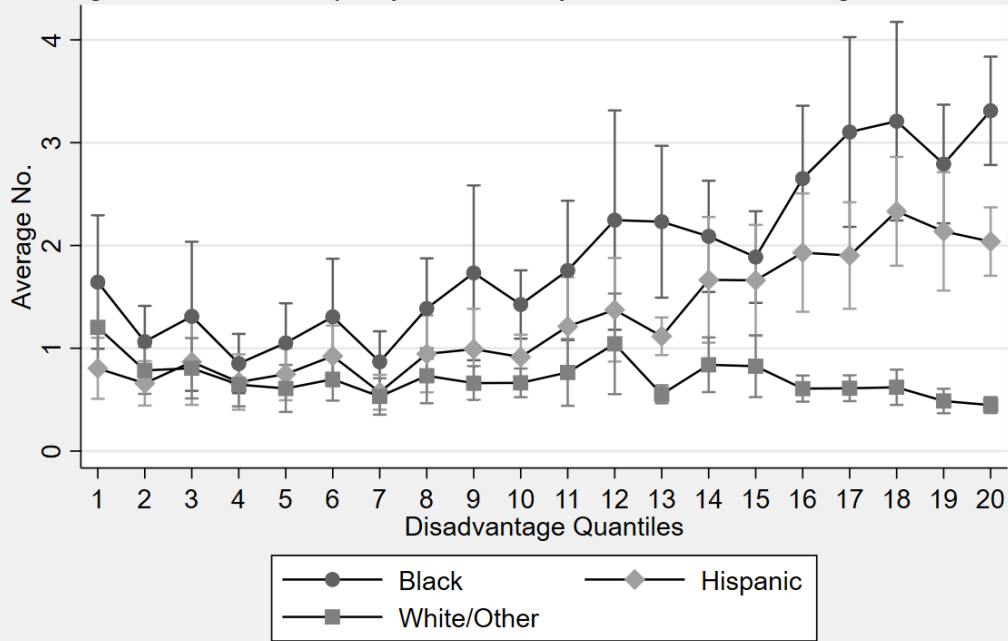
Exponentiated coefficients (Incident Rate Ratios); Standard errors in parentheses clustered at census block group.
 ** $p < 0.01$

The results for Los Angeles show a black arrest rate of 1.55 per month, which is 44 percent lower after controlling for concentrated disadvantage and crime or victimizations of black residents. The Hispanic arrest rate of 2.49 per month is approximately 17 percent lower after controlling for concentrated disadvantage and crime or victimizations of Hispanic residents. The white and other groups arrest rate of 1.31 is substantially lower after controlling for regions of the city and year, though there is very little association with concentrated disadvantage.

Figures 4-6 examine the association between arrest rates for blacks, Hispanics, and whites or other groups by level of concentrated disadvantage and reported crime. Each figure displays the marginal effects (expected rate) across twenty quantiles (0-5...95-100 percentile), controlling for all other measures specified in column (4) of Table 11.

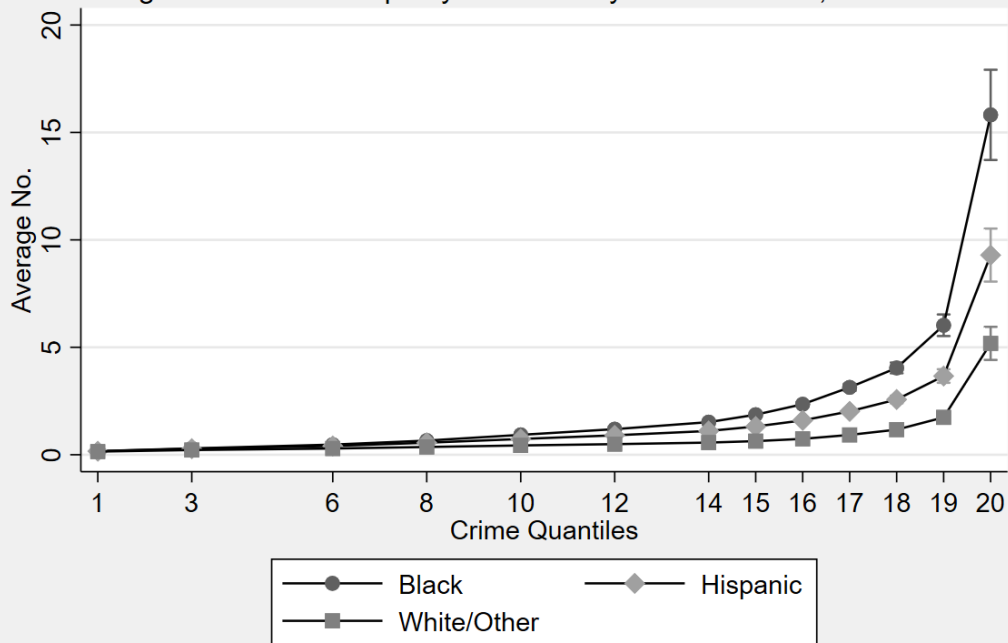
Figure 4a shows that in New York City the higher black and Hispanic arrest rates association with concentrated disadvantage is driven by the upper 75 percentile. By comparison, there is no association between the arrest rate of whites and others and the level of concentrated disadvantage. Figure 4b shows that the nonlinear relationship between levels of crime and arrests, and that the arrest rates are driven by the 95 percentile of census block groups. While the general increase is similar for all groups, the base rate is substantially higher for the black and Hispanic arrest rate, implying that the higher arrest rate in the highest crime areas has a larger population level impact on black and Hispanic arrest disparities.

Figure 4a. Racial Disparity in Arrests by Level of Disadvantage, NYC



Note: Standard errors clustered by block group.

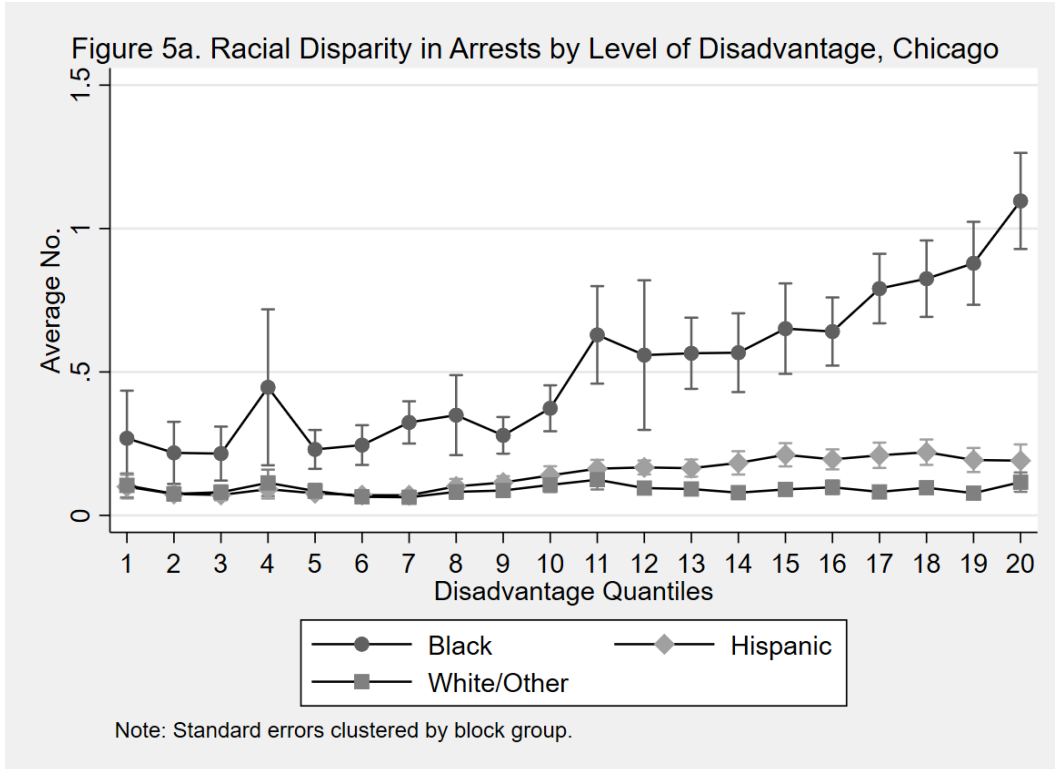
Figure 4b. Racial Disparity in Arrests by Level of Crime, NYC



Note: Standard errors clustered by block group.

Figure 5a and b shows that concentrated disadvantage and crime is substantially associated with a higher black arrest rate in Chicago, but has little relationship with the Hispanic or white and other groups arrest rates. The black arrest rate increases substantially when census

block groups are in the upper 40 percentile of concentrated disadvantage or crime. However, as revealed in Table 11 the strength of the association is stronger with crime than concentrated disadvantage, such that the disparity in arrests growth substantially larger among block groups ranked in the 90th percentile of crime.



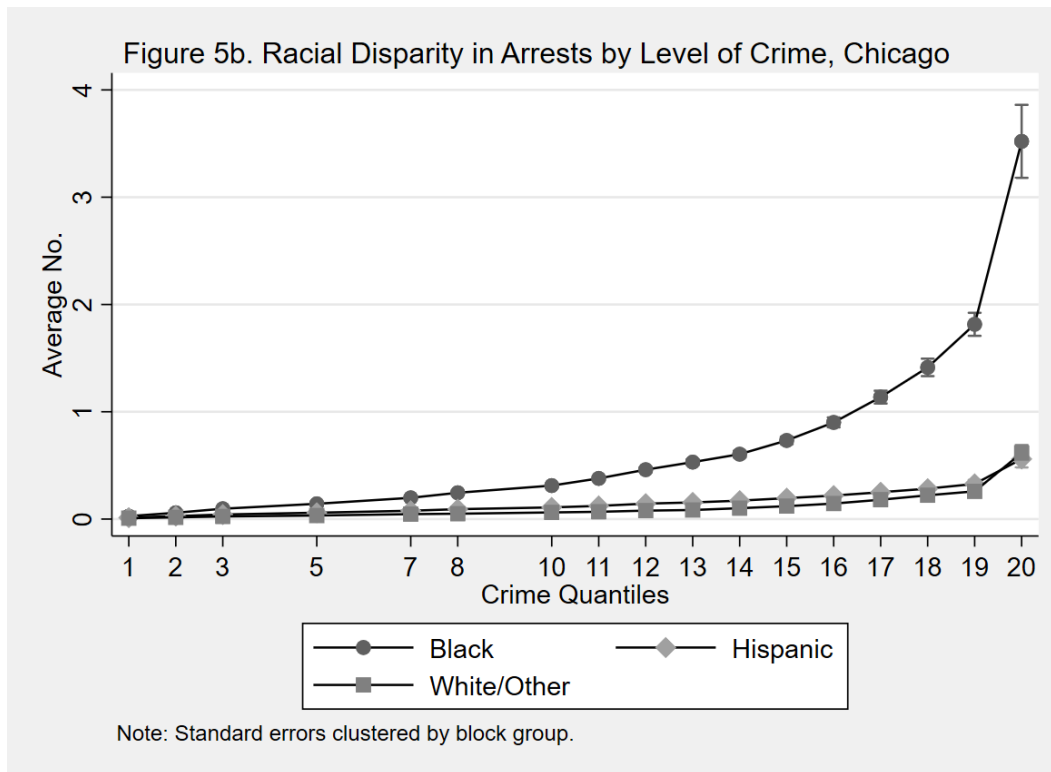
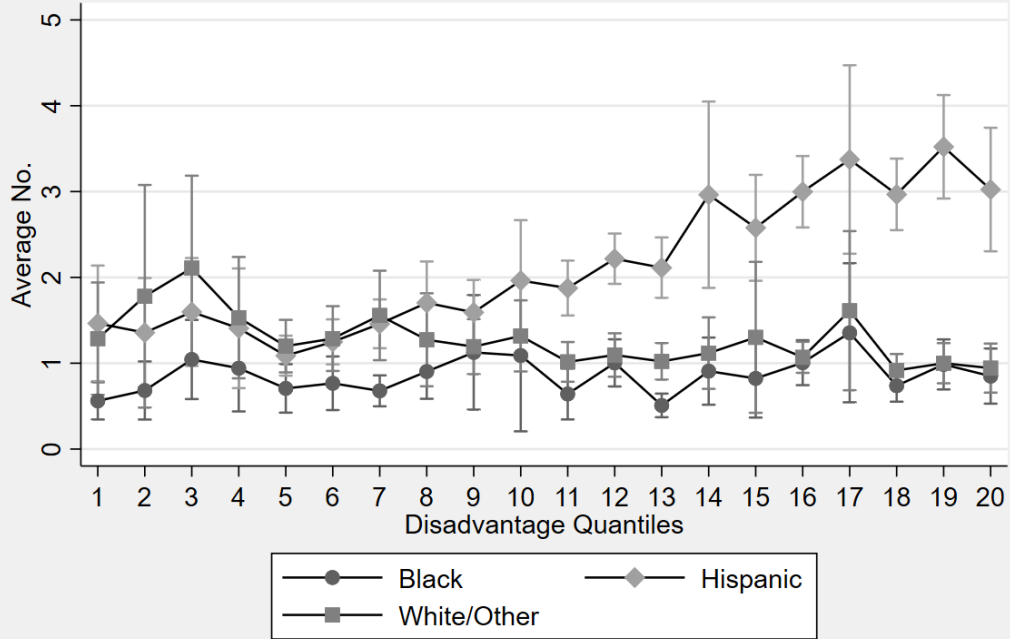


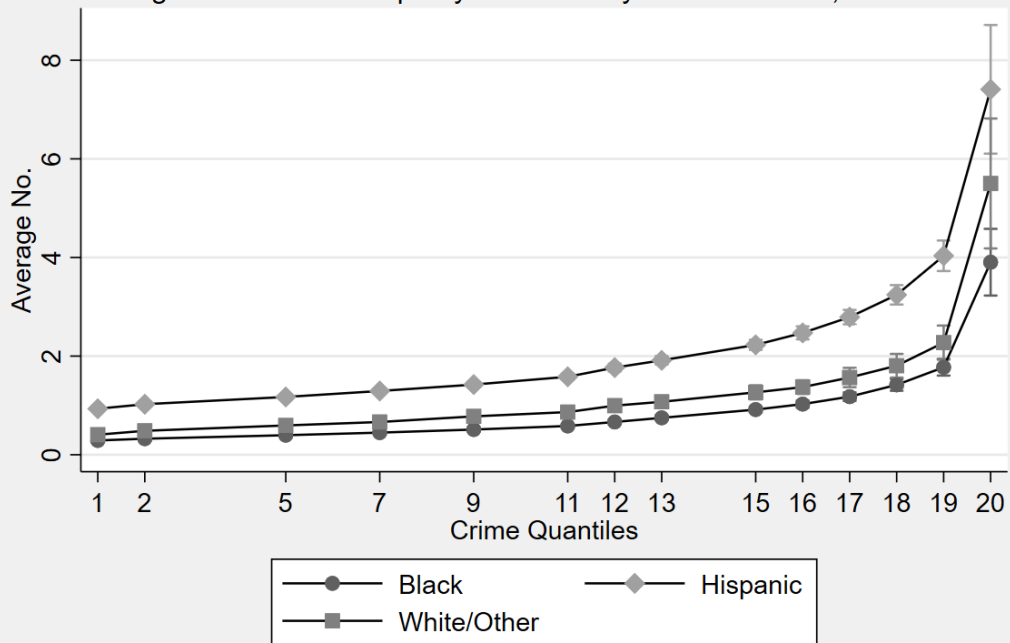
Figure 6a shows that for Los Angeles the association with concentrated poverty and a higher Hispanic arrest rate is driven by the upper 30 percentile. There is effectively no association with concentrated disadvantage and variation in the arrest rate for blacks or whites and other groups after controlling for crime. Figure 6b shows that the 95 percentile has a disproportionate relationship with higher arrest rates for all race and ethnic groups. The relative disparity in rates for Hispanics relative to others in Los Angeles is very comparable to black arrest rate disparities in Chicago.

Figure 6a. Racial Disparity in Arrests by Level of Disadvantage, LA



Note: Standard errors clustered by block group.

Figure 6b. Racial Disparity in Arrests by Level of Crime, LA



Note: Standard errors clustered by block group.

The results from the regression estimates and figures reveal a few key takeaways. First, the racial and ethnic disparities in arrest rates are strongly associated with differences between areas in concentrated disadvantage and crime. Crime rates are more associated with racial disparities in

arrest rates than concentrated disadvantage. Census block groups in New York, Chicago, and Los Angeles with the highest rates of crime are substantial contributors to the population level disparities in arrest rates between blacks and Hispanics relative to whites and other groups. Second, while city level differences in black and white poverty appear to have little association with racial disparities in arrest rates, the hyper-concentration of crime and poverty within in America's three largest cities appears to play a substantial role in explaining racial disparities in the arrest rates. Third, while the causes of what drives the role of place in shaping disparities is beyond this scope of this study, the results imply that place-based disparities are important population drivers of official contacts between the police that results in racial disparities in arrests. Population level disparities in arrest rates for blacks could be cut by 30 percent in New York (2.05 to 1.43), 25 percent in Chicago (1.20 to .894), and 29 percent in Los Angeles (1.55 to 1.10) by moving the 95th percentile of census blocks from their observed arrest rate to the 50th percentile.¹⁴

While the evidence presented here suggests that the variation in the level of concentrated disadvantage and crime in New York, Chicago, and Los Angeles are important for understanding population level racial disparities in arrests, there are important limitations to acknowledge. These analyses of cities do not account for repeat arrests of the same individuals in estimating racial disparities in arrest rates by census block groups. Given that criminal behavior is highly concentrated among a subset of the population, it is likely that within the highest crime places there are a subset of individuals generating a disproportionate share of the arrests. Accounting for repeat arrests among the same individuals could be another source for population level racial disparities. Additionally, the arrest data were not disaggregated into seriousness of crime categories or other relevant contextual information that may influence arrest decisions. Research shows that arrests are more likely when a crime is more serious, suspects have a criminal history, the demeanor of suspects, the desires of victims, and whether a witness is present (Kochel, Wilson, and Mastrofski, 2011). Disaggregating arrest counts by the seriousness of the offense and relevant contextual information may influence the size and direction of population level racial disparities in arrests. The analyses of New York, Chicago, and Los Angeles also does not

¹⁴ In New York City, Chicago, and Los Angeles this represents an area of approximately 275 block groups (population of roughly 470,000 residents), 100 block groups (population of roughly 163,000 residents), and 112 block groups (population of roughly 228,000) respectively.

examine anything about the actual environmental context of the highest crime places that generate a disproportionate share of the racial disparities in arrests. Research consistently finds that abandoned buildings, vacant lots, inadequate street lighting, rundown bars and commercial establishments, excessive trash, and other indicators of a neglected built environment are a key feature of crime hot spots. It is possible that racial disparities in arrests are being driven by environmental aspects of places that generate pockets of crime (Jean, 2008). Finally, these analyses do not examine repeat arrests made by the same officers, when research has found that a subset of officers generate a disproportionate share of arrests in a given location. Future research should examine how much the racial disparities being generated by places with the highest rates of crime and concentrated disadvantage are being driven by variation in repeat arrests, officers making the arrests, the seriousness of arrest offenses, contextual information about arrests, and the environment of places.

Conclusions

This paper examined the extent to which racial stratification in the spatial concentration of poverty and crime helps explain higher rates of police contact, arrests, and fatal encounters among minorities relative to the white population. The review of prior research suggests that racial disparities in economic disadvantage and crime by place may be particularly salient for explaining racial disparities in police contact, but more research is needed that specifically examines the role of place-related factors in contributing to higher rates of police contact. Residential segregation and the concentration of poverty exposes blacks and Hispanics in many cities to different levels of criminal victimization and police interaction. Police in many cities in an effort to control crime engage in proactive police tactics in high crime areas including use of stops and arrests for misdemeanor offenses, but they could also focus on problem solving activities in disadvantaged communities. As Braga and Weisburd (2010) note, the issue of addressing community problems is especially important in “minority neighborhoods where residents have long suffered from elevated crime problems and historically poor police service” (p. 5). Evidence from experiments suggests that when police and other municipal agencies work with community members to reduce problem places that generate the disproportionate share of serious crime on blocks - from a vacant lot with piled up trash to a problematic bar or poorly managed apartment building - crime drops without the collateral consequences of additional

arrests (Braga and Weisburd, 2010). Situational crime prevention strategies that focus on changing the structural aspects of places that generate crime, from cleaning up vacant lots to installing better street lights, help reduce serious crime in areas without displacing it nearby (Braga and Bond, 2008; Branas et al., 2018; Chalfin et al., 2021; MacDonald et al., 2021). Additionally, proactive police stops that are applied based on behavior instead of loose heuristics of criminal suspicion help reduce crime and minimize racial disparities in who is stopped by the police (MacDonald, Fagan, and Geller, 2016). The results from this research suggest that it is possible to reduce population level racial disparities in arrests substantially by focusing more efforts at place-based responses that address problematic crime hot spots. One approach is for police agencies to collaborate with other city agencies and community groups to address the underlying risk factors that generate high rates of crime (Braga and Weisburd, 2010). A community-level approach that gives priority to making structural changes to the most disadvantaged high-crime places may be particularly useful. Changing street lights, cleaning up vacant lots, and remediating abandoned housing are all examples of place-based interventions that can be scaled up to high crime areas to benefit many people living in these spaces (MacDonald et al., 2019). Focusing more attention to directing public safety resources to the small percentages of places and offenders within these locations that likely generate disproportionate share of racial disparities in arrests could substantially reduce population level racial disparities in arrests.¹⁵

Polices that privilege crime control over community satisfaction with service are especially damaging in racial minority neighborhoods with higher rates of poverty, crime, and greater demands for police service. The tension between the police and minority communities most in need of police protection is not new, and is an endemic feature of policing in America. A neighborhood problem solving approach that engages the police, municipal services, and community-based organizations to identify crime hot spots and target them for place-based interventions that communities desire would be a particularly useful approach to attempt. There are important normative questions about what tactics are effective at controlling and acceptable

¹⁵ Sherman (2007) has similarly noted that the biggest benefit for interventions to reduce crime and show efficacy of in experimental trials would be those that focus on the “power few” or “the small percentage of places, victims, offenders, police officers or other units in any distribution of crime or injustice which produces the greatest amount of harm” (p. 299).

to communities. Place-based approaches to addressing public safety offer some guide for how to improve the well-being of communities and reduce racial disparities in police contact.

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