Policing Socio-Geographic Boundaries and Inequality

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Abstract

How do patterns of economic and racial inequality shape policing behavior in the United States? In contrast to a crime focused model, we ask whether police engage primarily in boundary maintenance at geographic points of racial and socio-economic difference. Critical race scholars have suggested that law enforcement as an institution explicitly serve this function. Yet, empirical studies are both rare and limited to snapshots of a single city that rely on disparate and fragmented data making it hard to (1) evaluate system-wide sources of racial disparities and (2) distinguish problematic practices widely employed across departments from agency- and officer-level idiosyncrasies. We introduce a new dataset with municipal addresses where police arrests took place together with census data at the block and block group levels for five major cities in the United States to evaluate the extent to which the police maintain socio-political boundaries across numerous contexts. We find that arrests are more pronounced at boundaries that are highly racially and socio-economically dissimilar relative to those that are similar, and this persists net of crime.

Keywords: policing; gentrification; segregation; inequality

Introduction

What is the role of policing in making and maintaining geographic boundaries that reinforce and exacerbate racial and economic inequality in American cities? While critical geographers focus on segregation and conflict between citizens in geographic communities, the police – and specifically the role they play – is often absent from these studies. Conversely, while urban politics scholars examine the role of the police vis-à-vis gentrification, and have increasingly done so quantitatively, these studies focus on within-neighborhood change, which obscures how the police maintain social and economic segregation at neighborhood boundaries. Across both disciplines, cross-city studies are exceedingly rare. In this paper we do the following: (1) theoretically bridge these two literatures by focusing on policing patterns at geographic boundaries that are highly socio-politically unequal; (2) empirically employ a multi-jurisdictional dataset, and (3) methodologically leverage boundary identification techniques developed by geographers to evaluate the relationship between inequality and policing.

While previous research on the consequences of sociopolitical boundaries argue that transitional zones breed conflict between citizens, and find that crime is higher in these spaces. However, a large body of literature demonstrates that policing patterns are not solely responsive to crime. Instead, institutional practices disproportionately target non-white people for police intervention, saturate marginalized communities with police engaged in surveillance, and organize regulatory enforcement around patterns of consumption and consumptive behavior. In this paper, we argue that because police are engaged in maintaining social order, we should expect to see heightened policing in transitional zones from one demographic group to another. For example, in boundary communities adjacent to white/wealthy communities on one side and Black/poor communities on the other. Because the history of policing is deeply raced, and contemporary policing practices are disproportionately targeted to people of color, we anticipate that boundaries marking racial difference will be more strongly (positively) predictive of arrests than those marking socioeconomic difference. For the same reason, we argue that the predictive power of racial difference should persist net of crime.

Leveraging methods of *areal wombling* developed by Legewie and Schaeffer (2016) and Legewie (2018), we evaluate this argument in the context of five cities, diverse in location, histories with policing and gentrification, and racial composition. Policing and crime data granular enough to develop the kind of analysis we employ here is not widely available. As a consequence, previous studies on this (and related) topics are very often limited to a single city. One contribution of this project, then, is the ability to evaluate the relationship between policing and the maintenance of the social order across contexts and in a generalizable way. We find that support for the theory that racial boundaries are a primary driver of arrests across all but one of our cities. This is true net of crime. Violent crime remains the largest predictor of arrests, suggesting that police are responding to crime, even as crime does not fully account to for police behavior. Moreover, a sensitivity analysis reveals that the coefficient of any omitted confounding variable would have to be about four times greater than that of violent crime to reduce the impact of racial boundaries on arrests to zero. We also find that socioeconomic boundaries are predictive of police behavior, in ways that are similar to racial boundaries. However, differences in levels of geographic aggregation lead us to characterize findings on socioeconomic boundaries as inconclusive.

Background and Theory

To understand how policing makes – and maintains – socio-geographic inequality, we draw on research examining (1) geographic boundaries as points of conflict and (2) the role of police in maintaining segregation and regulating gentrification. Critical geographers have examined underlying forces that promote segregation and conflict between geographic communities. This research is nascent; the more sophisticated work primarily grapples with how to computationally identify boundaries and their contributing factors (Legewie and Schaeffer, 2016; Kramer, 2017; Legewie, 2018; Dean et al., 2019). These scholars position spatial boundaries characterized by social inequality as points of conflict, where individuals

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come into contact with outgroup members in ways they would not otherwise when situated in more homogeneous spaces. When racial groups clash, in-group members on both sides may be threatened, leading to heightened conflict (Legewie, 2018). Moreover, edges where differing communities meet may have lesser social cohesion. Scholars describe them as, "interstitial or transitional areas sandwiched between two homogenous communities" (Legewie and Schaeffer, 2016, pg. 124). For criminologists, social cohesion is central to managing (and dampening) criminogenic behavior (Kim and Hipp, 2022). Thus, crime is heightened in boundary communities (Legewie and Schaeffer, 2016; Kramer, 2017; Kim and Hipp, 2022; Legewie, 2018; Dean et al., 2019).

Scholars interested in geographic boundaries as sites of social conflict are on the leading edge of developing methodological frameworks for evaluating "objective forms of social differences manifested in unequal access to and unequal distribution of resources" (Dean et al., 2019, pg. 272). However, even as the social construction of spatial hierarchy animates this fledgling line of inquiry, scholars largely ignore the police and instead assume that law enforcement follows crime. In contrast, scholars of urban politics interested in gentrification directly engage the role of police. Research in this vein identifies the particular importance of order maintenance policing (OMP) practices for promoting economic development and the displacement of the poor (Desmond and Valdez, 2013; Beck, 2020; Collins, Stuart, and Janulis, 2022). Such practices – e.g., citations levied to address visible signs of poverty such as homelessness – are (at least in part) in response to citizen's demands, vis-a-vis 311 and 911 calls (Desmond and Valdez, 2013; Herring, 2019; Harris, Rigolon, and Fernandez, 2020; Sahn, Lerman, and Mooney, Working paper). Policing, then, does not simply follow crime, but instead is wielded to regulate socio-political cleavages by citizens and lawmakers alike (Muñiz, 2015; Laniyonu, 2018).

While class and race are co-constitutive, particularly as it pertains to spatial policing (Stuart, 2011; Soss and Weaver, 2017; Ramírez, 2020), it is important to conceptually disaggregate them because empirically we understand that economic investment and development

follows race. For example, Hwang and Sampson (2014) find that community reinvestment in Chicago occurred in neither the most disadvantaged neighborhoods nor the most heavily Black and Latinx neighborhoods. Instead, community reinvestment happened in areas with fewer signs of visual disorder and with relatively high white populations. Investment progressed more slowly in working class Black and Latinx communities, as white in-movers self-selected into whiter neighborhoods. Characterizing urban development, Summers and Howell (2019, pg. 1088) write:

> As urban studies scholars have developed conceptual frameworks for exploring the interrelatedness of race and urban space, the racialization of space is an important organizing principle through which unequal and uneven development takes place, rather than being the result of this development.

The tastes, preferences, and demands of comparatively wealthy, white in-movers, then, drive processes of urban development. But of course, these tastes, preferences, and demands manifest through racial biases. Gentrifiers are new constituents for municipal officials of whom they make demands for greater policing and other regulation of public space. At the same time, public officials themselves engage in the business of creating, recreating, and regulating public spaces to promote certain interactions within developing spaces while penalizing other kinds of interactions within the same spaces. As one scholar put it, "The history of planning could be rewritten as the obsession with managing fear in the city" (Sandercock, 2000, pg. 205) – where public space is increasingly organized around consumption; regulation is designed to support consumption related activities; and enforcers are deployed not to exclude bodies altogether but to incentivize primarily consumptive behavior in said spaces (Summers and Howell, 2019).

The gentrification processes, then, may occur in spaces that are neither deeply disadvantaged nor overwhelmingly nonwhite. They may be adjacent to communities that are very poor and/or very nonwhite. Law enforcement may then be deployed to regulate activity in and especially around these newly developed and increasingly white spaces. Existing research

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on the relationship between race, space, and policing is often on within-neighborhood units (e.g., variation across census tracts or police beats). And to the extent researchers do consider inter-community dynamics, they simply include a lagged variable for the composition of neighboring units. This metric, while rough, does offer support for the idea that points of inequality are important spaces of state regulation. Consider that scholarship examining the relationship between the prevalence of stop-and-frisk and use-of-force in New York City neighborhoods: there is evidence to suggest that adjacency to a predominately Black or Latinx neighborhood heightens the likelihood of use-of-force incident. In fact, the statistical magnitude of the adjacency metric is larger than that for the percent Black/Latinx within a given neighborhood; moreover, the statistical significance of the metric as a predictor of use-of-force is robust even adjusting for crime (Omori, Lautenschlager, and Stoler, 2022).

Similarly, decomposing dimensions of segregation, Zhao, Yang, and Messner (2019) find that living in close proximity to outgroup members is associated with heightened risk of being searched and arrested for Latinx people. For Black people, living in highly segregated census tracts, which are themselves relatively small geographic units, increases the risk of these same outcomes (Zhao, Yang, and Messner, 2019). Evaluations of the relationship between policing and segregation are perhaps conceptually closest to our query here. It is worth noting, however, that there are very few works examining segregation and policing specifically, where scholars have focused on other kinds of community dynamics (Trounstine, 2016). Together with developments made by critical geographers, these findings in reference to segregation help make the case that we should be evaluating the behavior of police at points of inequality rather than simply via variation within geographic units.

These findings also highlight the primacy of race as a driver of policing behavior. In their investigation of the connection between patterns of stop-and-frisk and incidents of use-of-force, Omori, Lautenschlager, and Stoler (2022) position use-of-force as a natural outgrowth of frequent stops and define use-of-force as a set of over-policing practices. Preemptive policing practices – e.g., interacting frequently with civilians, saturating neighborhoods with

police presence, and relying on markers of alleged criminality rather than evidence that a crime has transpired – are themselves endemically raced (Epp, Maynard-Moody, and Haider-Markel, 2014; Baumgartner, Epp, and Shoub, 2018). Policing reinforces racial inequality through the uneven spatial deployment of police (Muñiz, 2015; Soss and Weaver, 2017; Walker, 2020). For example, proactive stops are more likely to be carried out in neighborhoods of color; but reactive stops are more likely in white neighborhoods (Gaston, 2019). Likewise, living in a historically red-lined community increases the chances of a fatal encounter with police (Mitchell and Chihaya, 2022). Also consider the likelihood of being stopped when one is "out-of-place" – i.e., when a Black or White individual is in a neighborhood heavily populated by outgroup members. Hannon, Neal, and Gustafson (2021) find that while White people are more likely to be stopped when they are out-of-place than when not, Black people are equally likely to be stopped regardless of neighborhood. And in fact, they are a little more likely to experience a stop when they are in-place, where race and space both confirm stereotypes about likelihood of criminal behavior.

In parallel to this vast literature establishing how modern policing practices are characterized by racial disparities at every level, there is also evidence that such practices do not meaningfully improve public safety (Cohen, Gorr, and Singh, 2003; Kane and Cronin, 2013; Corman and Mocan, 2005; Kane, 2006). Given this discussion, it is unreasonable to expect the presence of crime to fully account for policing activity. Instead, we contend police activities occur more frequently at boundaries between communities characterized by racial inequality – even after adjusting for crime.

In sum, we propose to examine the role of law enforcement in making and maintaining socio-geographic inequality across neighborhoods by examining policing at within-city boundaries, transitional zones where groups meet and intermingle. We draw on the work of critical geographers who have developed an empirical framework for evaluating these "social frontiers... where there are steep differences in racial, ethnic, religious, cultural or social characteristic" (Dean et al., 2019, pg. 272). These border zones – "cliff edges in the complex

landscape of segregation" (ibid) – are points of social cleavage and conflict. Critical geographers, however, have primarily focused on conflict between private citizens manifesting as crime. As such, there is no theoretical framework for understanding how the state maintains socio-geographic divisions. The literature on gentrification offers one way to study the police, pointing to the racialized nature of modern policing practices and their function in maintaining social control. Yet, the empirical attention in these works is often about the variation within-neighborhood or cross-neighborhood (Legewie and Schaeffer, 2016; Kramer, 2017; Dean et al., 2019) instead of the transitional zones between neighborhoods. Focusing on patterns of policing within a given neighborhood is insufficient when neighborhoods undergoing change are contiguous. We might see equivalent levels of policing and changes in policing across gentrifying tracts. But, if the police are instrumental by regulating how individuals can access a neighborhood and its amenities, then we should expect to see variation in policing practices apparent at neighborhood margins – especially where there are sharp disparities between adjoining neighborhoods.

Argument and Expectations

We bridge the research on geographic boundaries and segregation and gentrification to address the relationship between policing practices and the making and maintenance of socio-geographic inequality in urban spaces. We contend that to understand how the police maintain socio-geographic inequality requires a boundary identification approach developed by critical geographers. Building on research around segregation and urban renewal, we anticipate that we are likely to observe patterns of policing that reflect unequal and contentious boundaries. There has been considerable scholarly effort devoted to identifying how policing disproportionately impacts communities of color. For example, scholars have highlighted that modern policing is characterized by practices that use space as a heuristic for race or class. This suggests the centrality of race to understanding the relationship between bound-

aries and policing practices. Yet, most of these studies focus on the geographic community itself, and we argue this methodological approach captures only part of how police operate to regulate race. Even as deeply marginalized communities may experience high levels of policing, policing practices aimed at social control should intensify at neighborhood boundaries where a minority neighborhood or a poorer neighborhood transitions into a White, more affluent community. Specifically:

Hypothesis 1: Boundaries characterized by high racial differences will be positively associated with police activity.

Moreover, research on gentrification – documenting how heightened policing in gentrifying spaces often follows from in-moving citizen demands – has naturally centered socio-economic changes. These works often group racial and economic marginalization together. However, there is some evidence to suggest that investment in community development is more pronounced in neighborhoods that are more heavily White relative to those that are more heavily Black and Latinx. Likewise, research on policing confirms repeatedly that Black Americans are disproportionately targeted by law enforcement, even as they move through spaces of varying class. For these reasons, we anticipate that points of racial and ethnic inequality will be more strongly and positively predictive of law enforcement activities relative to points of socio-economic inequality:

Hypothesis 2: Boundaries characterized by racial/ethnic differences will be more strongly (positively) associated with police activity than boundaries characterized by socio-economic inequality.

Finally, scholars have also argued that spatial boundaries characterized by social inequality are high-conflict and high-crime. As such, we may observe more intense policing at unequal boundaries because police are there to address conflict and criminal activity. Yet, this research does not disaggregate between racial/ethnic and socio-economic inequality; at best it only controls for concentrated disadvantage at the Census block level. But crimes driven by socio-economic disparity are not synonymous with strict racial conflict. A key

task of our project is to disaggregate between socio-economic and racial/ethnic inequality, where research on policing itself suggests that enforcement tactics are informed by racial stereotypes and do not always yield public safety gains. For these reasons, we develop the following hypothesis with respect to crime:

Hypothesis 3: The association between racial/ethnic and class differences at neighborhood boundaries and police activity will persist independent of crime.

In doing so, we evaluate the maintenance of unequal boundaries by interrogating patterns in the street-level deployment of state actors (police) rather than through the lens of private conflict between citizens (which has been the focus of critical geographers).

Data and Design

Measuring Policing Activity

Our measure of police activity are *arrests*. Prior evidence suggests *arrests* measure policing activity net of crime, since many arrests are discretionary and motivated by officer biases (Stashko, 2018). We acquire incident-level arrest data across five cities: Atlanta, GA; Austin, TX; Boston, MA; Milwaukee, WI; and Seattle, WA. These five cities range widely in geographic location, racial composition, and histories with policing. Evaluating policing patterns across multiple cities allows us to assess to generalizability of our theory and account for idiosyncracies of specific police departments across multiple urban contexts. We have complete data on arrests between 2012-2014 for these cities.

To prepare the data for analysis, we 1) geocode each arrest location for each city and 2) geolocate each arrest inside its respective 2010 Census block. We summarize the number of arrests between 2012-2014 for each block, and log the outcome (plus 1 to ensure identification) to account for the right-skewed outcome distribution.

Measuring Socio-Demographic Boundaries

Our key independent variables are boundaries as defined by the level of racial and socio-economic difference between adjacent neighborhoods. Critical geographers have created innovated methods for detecting data-driven boundaries to assess how spatial areas marked by deep demographic differences may lead to heightened conflict or decreased social cohesion (Legewie and Schaeffer, 2016; Kramer, 2017; Dean et al., 2019). To this end, we use an areal wombling technique, which detects boundaries based on differences in the values of spatial data derived from areal units (e.g. a census block or block group). Based on the availability of census data, we calculate *racial boundaries* at the census block-level and *socio-economic boundaries* at the census block group-level.

To measure *racial boundaries* and to test *hypothesis 1*, we identify a given census block within a city context. We then identify its adjacent block groups. Then, we calculate the absolute value difference between the proportion of the block's population that is white and adjacent blocks (using 2010 decennial census data). Following Legewie, 2018, we take the maximum difference and use that as the *racial boundary* value. This helps to capture drastic geographic boundaries between predominantly white and non-white blocks. The equation to calculate the *racial boundary* measure is:

$$racialboundary_i = max(|\%white_i - \%white_{ij}|)$$

Where i represents census block i. j are neighboring blocks to i, where $j = \{1...n_i\}$ in n neighbors to i. The boundary value is scaled between 0-1, where 0 represents no difference in the proportion of the population that is white between adjacent areas, and 1 represents a maximum difference.

We measure *socio-economic boundaries* to test *hypothesis 2*, with a similar areal wombling approach, but instead calculating census block-group differences since socio-economic data is only available at the block-group level (we use the 2010-2014 American Community Survey).

We calculate boundaries based on the difference between the percent of the population that is living in poverty. This allows us to test the effect of intense class boundaries thus taking the first step toward disentangling the relationship between policing and the dual forces of racial/ethnic boundaries and socio-economic inequalities. The equation to calculate the *socio-economic boundary* measure is:

$$econboundary_b = max(|\%poverty_b - \%poverty_{bc}|)$$

Where b represents Census block group b. c are neighboring blocks to b, where $c = \{1...n_b\}$ in n neighbors to b. The boundary value is scaled between 0-1, where 0 represents no difference in the proportion of the population that is in poverty between adjacent block groups, and 1 represents a maximum difference.

Controls

Crime

Previous work has found greater levels of crime at boundaries between racial/ethnically distinct neighborhoods (Legewie and Schaeffer, 2016; Kramer, 2017; Kim and Hipp, 2022; Dean et al., 2019; Legewie, 2018). Therefore, to test *hypothesis 3* and to show that the influence of socio-demographic boundaries on policing patterns persist net of motivations to reduce crime, we gather incident-level crime data for each of the five cities in our analysis. First, we subset the crime data to the same date range as the corresponding arrest data within each city. Second, we identify violent and property crimes for four of the five cities, which will serve as two distinct crime types for which we adjust.[1] Third, we geocode each crime for each of the five cities, and geolocate each arrest into its respective census block. Finally, we sum the total crimes for each type when possible, for each census block, during 2012-2014.

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[1]For Boston, we adjust for all crimes, since the data do not have sufficient information to disaggregate crime types.

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Socio-Demographics

We adjust for several block-level characteristics that may jointly explain policing activity and socio-demographic boundaries. We adjust for population (logged), the proportion of the male population that is 15-35, the proportion of the population that is white, and ethno-racial diversity across the 4 major ethno-racial groups in the U.S. (non-Latinx white, non-Latinx Black, Latinx, non-Latinx Asian) using the Herfindahl index.

We also adjust for a series of socio-economic block group level covariates to account for internal neighborhood characteristics as well as measures of neighborhood boundaries based on differences in socio-economic factors. These characteristics include: percent homeowners, logged median household income, the percent in poverty, percent unemployed, and percent college-educated. Furthermore, we control for another socio-economic boundary measure based on median household income.

Estimation Strategy

We use the following linear model for each city to test our hypotheses:

$$Log(Arrests_i + 1) = \alpha + \beta_1 racialboundary_i + \beta_2 econboundary_b + \sum_{k=1}^{k} \beta_{k+2} X_{ib}^k + \varepsilon_{ib}$$

Where $Arrests_i$ is the number of arrests in census block i, $racialboundary_i$ is the *racial boundary* measure scaled between 0-1 at the block-level (i), and $econboundary_b$ is the *socio-economic boundary* measure scaled between 0-1 at the block group-level (b). $\sum_{k=1}^{k} X_{ib}^k$ are k block and block group-level covariates. If *hypothesis 1* is true, $\beta_1 > 0$. If *hypothesis 2* is true, $\beta_2 = 0$. If *hypothesis 3* is true, $\beta_1 > 0$ conditional on adjusting for $\sum_{k=1}^{k} X_{ib}^k$. ε_{ib} are block group-clustered errors.
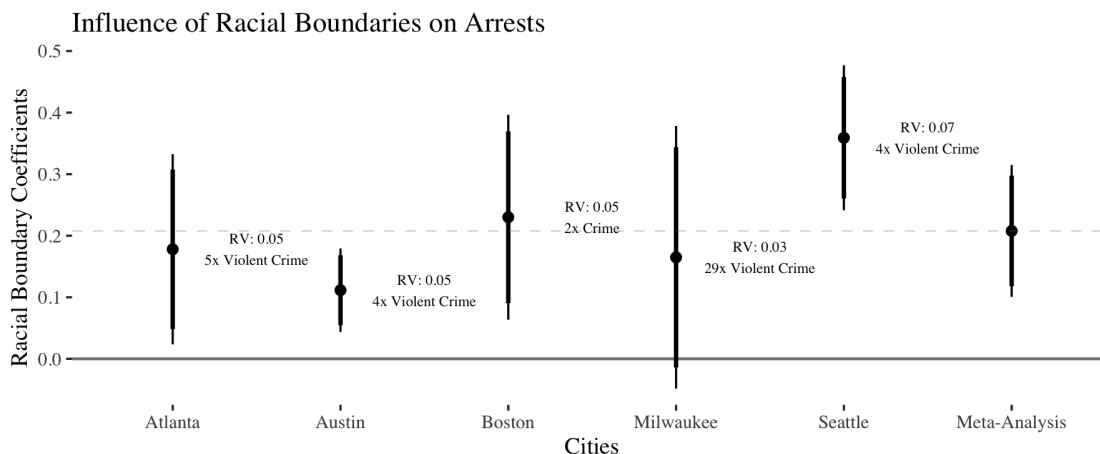
Figure 1: Influence of Racial Boundary on Logged Arrests (Standardized). X-axis is the city context. Y-axis are the min-max regression coefficients for *racial boundaries* across each city. Estimates from fully-specified models. Annotations denote the robustness value and bounding variable value necessary to attenuate the substantive influence of *racial boundaries* to 0. 95% CIs displayed from HC2 robust block group-clustered SEs.

Results

Racial Boundaries

Figure 1 displays coefficients characterizing the association between *racial boundaries* and logged *arrests.* For the purposes of cross-city comparison, we standardize the logged arrest variable by subtracting the quotient of the mean logged arrests divided by the standard deviation of logged arrests. Thus, our dependent variable represents the change in arrests by standard deviation units in response to going from the minimum to the maximum of *racial boundaries.* Consistent with *hypothesis 1, racial boundaries* are positively associated with policing activity in a statistically significant manner for four cities, with one city context barely missing significance with a large positive substantive influence (Milwaukee, $p = .12$). A random effects meta-analytic estimate on Figure 1 shows logged arrests increases by 0.21 standard deviations in response to a shift from the minimum to the maximum *racial boundary* level.

The findings on Figure 1 also support *hypothesis 3* as they show the positive and sig-

nificant relationship between *racial boundaries* and *arrests* are net of crime (for full list of controls included in the models see Tables 1-5 in the appendix). Even if transitional spaces between distinct racial/ethnic populations see increased conflict or crime, this does not entirely explain elevated levels of policing in these areas. Instead, police activity occurs along boundaries characterized by deep racial/ethnic differences independent of the level of crime.

Across all cities, violent crime is the most prognostic covariate of *arrests* (except Boston, where lack of dis-aggregated crime data shows crime, writ large, is the most prognostic). Therefore, we use violent crime as a bounding covariate to assess the sensitivity of *racial boundaries* to confounding using tools by Cinelli and Hazlett (2020). We find that the positive influence of *racial boundaries* in the 4 cities where there is a statistically significant coefficient would be attenuated to 0 in the presence of a confounder as large as 5x violent crime, 4x violent crime, 2x crime, and 4x violent crime. Given crime is arguably the most prognostic covariate of arrests, we believe it is unlikely such a confounder exists that would attenuate our statistically significant estimates to 0.

Following our theoretical argument, these results indicate that policing practices not only act as a form of social control within specific communities but also on the margins. Heightened police activity between white and nonwhite neighborhoods works to reinforce already entrenched patterns of racial segregation within urban communities. However, following previous literature on gentrification, policing practices at the boundaries of white and nonwhite neighborhoods also may play a role in shaping and creating new boundaries as cities undergo high levels of urban renewal. That is, policing may act as a barrier around gentrifying areas, strengthening newer boundaries between areas seeing an influx of increased investment and growing proportions of white residents and those that remain disinvested and/or contain greater proportions of nonwhite residents.

We further explore the heterogeneous influence of white racial boundaries conditional on white racial context. The results displayed in Figure 2 demonstrate that for Atlanta and Seattle, *racial boundaries* are positively associated with *arrests* in contexts that are both
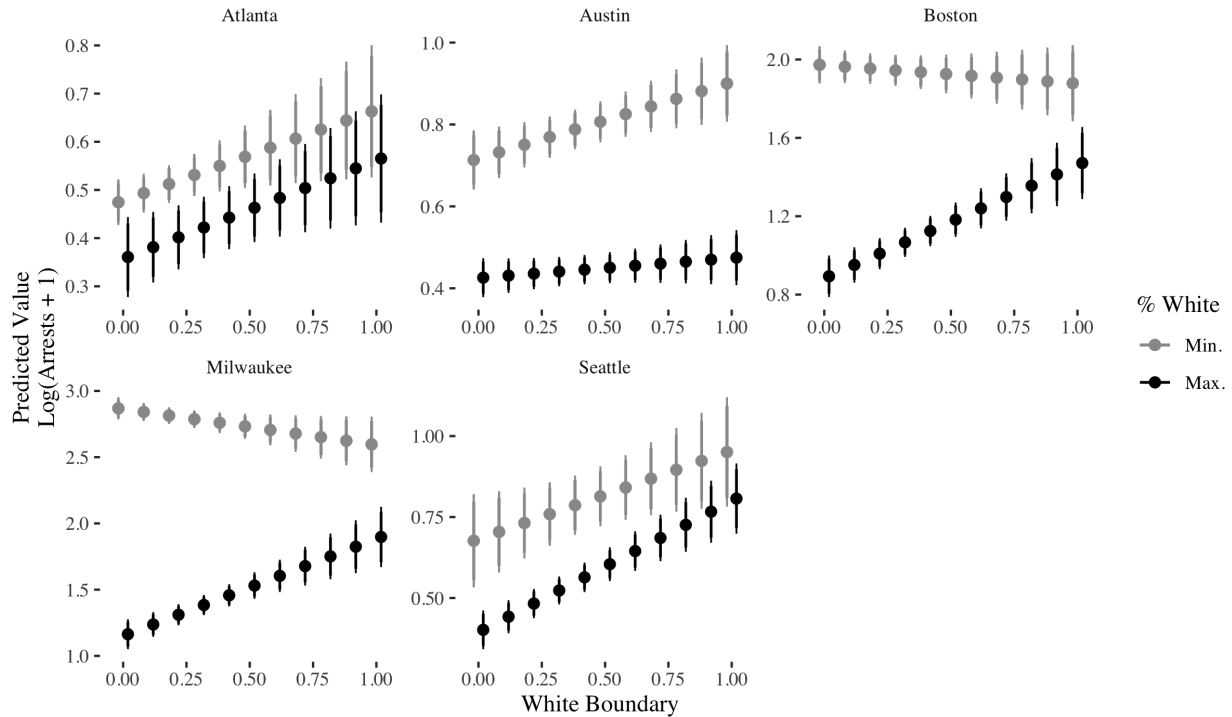
Figure 2: Heterogenous Influence of Racial Boundary on Arrests By White Racial Context. X-axis is the *white boundary* measure. Y-axis is the predicted logged number of arrests (+1 to ensure identification). Each panel characterizes a different city sample. Estimates from fully-specified models with controls at means. 95% CIs displayed from HC2 robust block group-clustered SEs.

predominantly non-white and white. However, for Boston and Milwaukee, *racial boundaries* are positively associated with *arrests* only in contexts that are predominantly white, suggesting police are engaging in more police activity to "protect" the white populace from non-white neighbors intruding in predominantly white neighborhoods. In Austin, the pattern is the opposite, *racial boundaries* are positively associated with *arrests* in contexts that are predominantly non-white.

Socio-Economic Boundaries

The results in Figure 3 show the effects of boundary values measuring the difference in the proportion of residents living below the poverty line on policing activity. These effects are
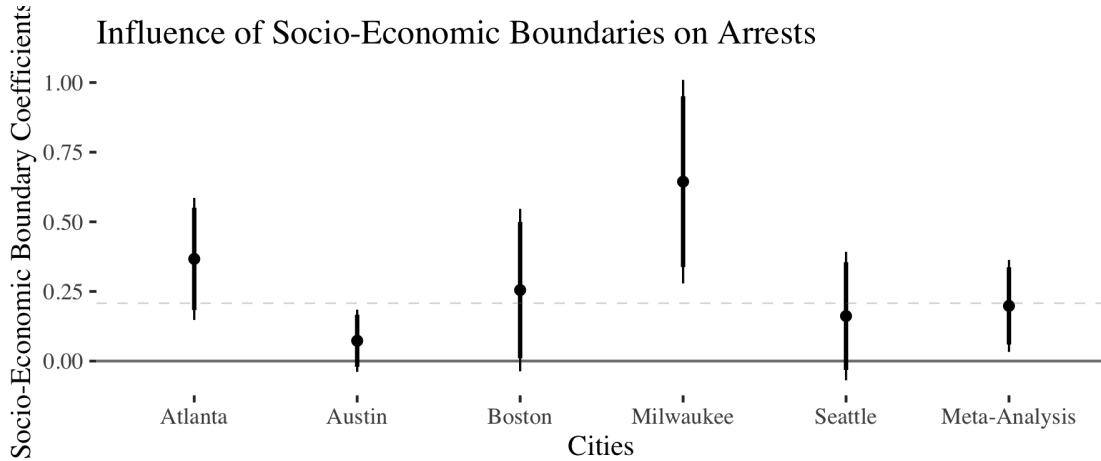
Figure 3: Influence of Socio-Economic Boundaries on Logged Arrests (Standardized). X-axis is the city context. Y-axis are the min-max regression coefficients for *socio-economic boundaries* across each city. Estimates from fully-specified models. 95% CIs displayed from HC2 robust block group-clustered SEs.

positive for all but one city. However, they are only positive and significant in two of the contexts, Atlanta and Milwaukee. In general, the findings suggest that neighborhood boundaries characterized by socio-economic inequality are also associated with increased policing activity. Like in Figure 1, these effects persist net of crime. Once again, this complicates traditional explanations that suggest that increased policing activity in adjacent spaces with pronounced differences in poverty levels or economic opportunities only occurs because of the propensity of these boundaries to animate conflict or crime. For at least some contexts, our evidence indicates that policing activity is not explicitly linked to crime and instead reinforces already existing class inequalities. Similar to how policing maintains racial/ethnic boundaries during processes of gentrification, these results suggest that policing activity may also function to craft and reinforce boundaries between redeveloping neighborhoods and those that remain disinvested. Even as certain areas within lower-income neighborhoods see increased investment and development, policing helps to maintain boundaries between these gentrifying blocks and more impoverished areas.

Figure 1 and Figure 3 suggest that the patterns of effects are similar across cities for both racial/ethnic boundaries and socio-economic boundaries. While the association between

racial/ethnic boundaries and policing activity appears more consistently significant than between socio-economic boundaries and policing, we cannot draw any definitive conclusions for H2 because the two models have different levels of analysis. The racial/ethnic boundaries are measured at the block level while the socio-economic boundaries are measured at the block group level. Future research should aggregate racial/ethnic boundary data at the block group level in order to better compare the effects between both models.

Conclusion

This paper examines how policing practices make and maintain race and class boundaries across multiple city contexts. We bring together the work of critical geographers in identifying socio-demographic boundaries and that of urban politics scholars around segregation and gentrification to offer a new perspective on police as a mechanism of social control. We leverage methods of boundary detection developed by critical geographers to identify spatial boundaries between largely homogeneous communities whereby differences in social, ethno-racial, or economic characteristics create heightened levels of conflict and decreased social cohesion (Dean et al., 2019; Legewie and Schaeffer, 2016; Kramer, 2017; Legewie, 2018; Kim and Hipp, 2022). While these studies primarily test the relationship between boundaries and crime, we draw on race critical theories of social control to guide an investigation into how these transitional spaces directly implicate police.

Policing practices are not simply responsive to crime. Instead, law enforcement proactively shape neighborhood environments and trajectories of urban renewal (Laniyonu, 2018; Desmond and Valdez, 2013; Beck, 2020; Muñiz, 2015; Sahn, Lerman, and Mooney, Working paper). We therefore turn attention to how policing interacts with boundaries defined by measures of socio-political inequality. Specifically we argue that boundaries characterized by high racial differences will be positively associated with police activity; Boundaries characterized by racial/ethnic differences will be more strongly (positively) associated with police

activity than boundaries characterized by socio-economic inequality; and the association between racial/ethnic and class differences at neighborhood boundaries and police activity will persist independent of crime.

To test our argument, we draw on an areal wombling technique developed by Legewie (2018) to create a measure of boundaries defined by sharp differences in racial and socio-economic characteristics. Then we introduce a dataset with individual-level, geocoded arrest data that allows us to evaluate with great specificity the nature and magnitude of policing activity at these boundaries of social cleavage. Ultimately we find that stark boundaries between white and non-white neighborhoods have a positive association with police activity in all five contexts under study, and those associations are statistically significant in four out of five cities under study. These associations persist net of crime, and sensitivity analysis reveals that the estimates are incredibly robust to confounding factors, where omitted variables would have to exceed crime by about four times in order to reduce the estimate to zero. We observe similar trends with respect to socio-economic boundaries. While we disaggregate racial/ethnic boundaries and socio-economic boundaries, the disparate levels of analysis, census blocks versus census block groups, mean that we are not able to directly test their effects against each other. Developing an appropriate measure of socio-economic status at the block level is an area for future development.

Ultimately, this paper makes several important contributions. First it introduces a new dataset with highly granular data that allows for precise investigations of police behavior across multiple urban contexts. It also builds upon the burgeoning studies of socio-geographic boundaries, adding an institutional component that unpacks the way state actors contribute to the formation and maintenance of these boundaries. Furthermore, it deepens our understanding of the relationship between race and policing by investigating how, in addition to over-policing in communities of color, policing practices may also increase in the transitional spaces between communities of color and predominantly white communities or spaces of neighborhood transition. Previous studies have focused on the between-citizen conflict that

occurs in transitional zones, and manifests as crime. We take as our point of investigation the role of police themselves. We therefore turn attention to the institutional forces that facilitate the persistence of racialized space in American cities.

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Appendices

Table 1: Influence of Demographic Boundaries on Arrest Intensity (Austin)

	(1)	(2)	(3)	(4)	(5)
Boundary (White)	0.11**				0.19*
	(0.03)				(0.07)
Boundary (Black)		0.25***			
		(0.06)			
Boundary (Latino)			0.18***		
			(0.04)		
Boundary (Global)				0.14***	
				(0.03)	
% White	-0.34***				-0.28***
	(0.04)				(0.05)
% Black		0.14		0.38***	
		(0.09)		(0.10)	
% Latino			0.26***	0.34***	
			(0.05)	(0.05)	
Log(Population)	-0.06***	-0.06***	-0.07***	-0.06***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	0.00***	0.00***	0.00***	0.00***	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Diversity	-0.27***	-0.18***	-0.12**	-0.18***	-0.26***
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Log(MHHI)	0.11**	0.13**	0.11**	0.12**	0.12**
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Boundary (Log(MHHI))	0.03	0.03	0.04*	0.04	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% Homeowner	-0.14**	-0.15**	-0.13*	-0.16**	-0.14**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
% Poverty	0.31**	0.37***	0.36***	0.33**	0.32**
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Boundary % Poverty	0.07	0.11	0.07	0.05	0.07
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
% Unemployed	0.22	0.31	0.21	0.25	0.22
	(0.21)	(0.20)	(0.21)	(0.20)	(0.21)
% College	-0.18**	-0.35***	-0.19**	-0.10	-0.19**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Log(Property Crime)	0.18***	0.18***	0.18***	0.18***	0.18***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log(Violent Crime)	0.46***	0.48***	0.47***	0.46***	0.46***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Boundary (White) x % White					-0.14
					(0.10)
R^2	0.67	0.67	0.67	0.68	0.67
Num. obs.	5756	5756	5756	5756	5756
N Clusters	505	505	505	505	505

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 2: Influence of Demographic Boundaries on Arrest Intensity (Atlanta)

	(1)	(2)	(3)	(4)	(5)
Boundary (White)	0.18*				0.19
	(0.08)				(0.10)
Boundary (Black)		0.20**			
		(0.07)			
Boundary (Latino)			0.25*		
			(0.12)		
Boundary (Global)				0.20**	
				(0.07)	
% White	−0.09				−0.07
	(0.06)				(0.08)
% Black		0.04		0.07	
		(0.07)		(0.07)	
% Latino			0.14	0.25	
			(0.17)	(0.17)	
Log(Population)	−0.01	−0.01	−0.01	−0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age	−0.00	−0.00	−0.00	−0.00	−0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Diversity	−0.00	−0.00	−0.03	−0.03	−0.01
	(0.06)	(0.07)	(0.07)	(0.07)	(0.06)
Log(MHHI)	0.14	0.14	0.12	0.13	0.14
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Boundary (Log(MHHI))	−0.03	−0.03	−0.03	−0.03	−0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% Homeowner	−0.37***	−0.36***	−0.36***	−0.36***	−0.37***
	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)
% Poverty	0.22	0.22	0.22	0.23	0.22
	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)
% Unemployed	0.38	0.37	0.38	0.37	0.38
	(0.21)	(0.21)	(0.21)	(0.21)	(0.21)
Boundary % Poverty	0.37**	0.35**	0.39***	0.36**	0.37**
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
% College	0.22	0.21	0.20	0.24	0.21
	(0.13)	(0.14)	(0.13)	(0.13)	(0.14)
Log(Property Crime)	0.29***	0.29***	0.30***	0.29***	0.29***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log(Violent Crime)	0.47***	0.46***	0.46***	0.46***	0.47***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Boundary (White) x % White					−0.04
					(0.13)
R^2	0.36	0.36	0.36	0.36	0.36
Num. obs.	4138	4138	4138	4138	4138
N Clusters	300	300	300	300	300

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$

Table 3: Influence of Demographic Boundaries on Arrest Intensity (Seattle)

	(1)	(2)	(3)	(4)	(5)
Boundary (White)	0.36***				0.29*
	(0.06)				(0.14)
Boundary (Black)		0.24**			
		(0.08)			
Boundary (Latino)			0.19*		
			(0.09)		
Boundary (Global)				0.37***	
				(0.06)	
% White	−0.21**				−0.26*
	(0.08)				(0.12)
% Black		−0.09		−0.02	
		(0.10)		(0.10)	
% Latino			0.24*	0.29*	
			(0.12)	(0.12)	
Log(Population)	0.09***	0.07***	0.06***	0.09***	0.09***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.00*	0.00*	0.00*	0.00*	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Diversity	−0.00	0.16**	0.13*	0.09	−0.01
	(0.08)	(0.06)	(0.05)	(0.07)	(0.08)
Log(MHHI)	0.01	−0.00	0.00	0.01	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Boundary (Log(MHHI))	0.02	0.02	0.02	0.02	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
% Homeowner	−0.43***	−0.41***	−0.41***	−0.42***	−0.44***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
% Poverty	0.08	0.14	0.18	0.10	0.08
	(0.18)	(0.18)	(0.18)	(0.18)	(0.18)
Boundary % Poverty	0.16	0.18	0.20	0.17	0.16
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
% Unemployed	0.61*	0.59*	0.59*	0.61*	0.60*
	(0.30)	(0.30)	(0.29)	(0.30)	(0.30)
% College	−0.12	−0.21*	−0.22*	−0.13	−0.11
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Log(Property Crime)	0.09***	0.09***	0.10***	0.09***	0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log(Violent Crime)	0.34***	0.35***	0.35***	0.35***	0.34***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Boundary (White) x % White					0.11
					(0.18)
R^2	0.37	0.36	0.36	0.37	0.37
Num. obs.	8569	8569	8569	8569	8569
N Clusters	495	495	495	495	495

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 4: Influence of Demographic Boundaries on Arrest Intensity (Milwaukee)

	(1)	(2)	(3)	(4)	(5)
Boundary (White)	0.16				−0.25
	(0.11)				(0.15)
Boundary (Black)		0.22			
		(0.12)			
Boundary (Latino)			0.06		
			(0.14)		
Boundary (Global)				0.31**	
				(0.10)	
% White	−1.33***				−1.60***
	(0.08)				(0.12)
% Black		0.74***		1.30***	
		(0.08)		(0.09)	
% Latino			−0.14	1.11***	
			(0.11)	(0.12)	
Log(Population)	0.26***	0.27***	0.28***	0.26***	0.27***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Diversity	−0.44***	−0.02	−0.21	−0.25*	−0.38***
	(0.10)	(0.11)	(0.11)	(0.11)	(0.10)
Log(MHHI)	−0.24*	−0.15	−0.22*	−0.22*	−0.23*
	(0.09)	(0.10)	(0.11)	(0.09)	(0.09)
Boundary (Log(MHHI))	−0.19***	−0.27***	−0.30***	−0.21***	−0.18***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
% Homeowner	−0.60***	−0.77***	−0.69***	−0.62***	−0.61***
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
% Poverty	0.20	0.43	0.50*	0.25	0.20
	(0.22)	(0.23)	(0.24)	(0.22)	(0.22)
Boundary % Poverty	0.64***	0.90***	1.29***	0.65***	0.60**
	(0.19)	(0.19)	(0.20)	(0.19)	(0.19)
% Unemployed	−0.09	0.06	0.69*	−0.08	−0.16
	(0.27)	(0.29)	(0.28)	(0.27)	(0.27)
% College	−0.21	−0.80***	−1.04***	−0.24	−0.14
	(0.16)	(0.16)	(0.18)	(0.16)	(0.16)
Log(Property Crime)	0.15***	0.16***	0.15***	0.15***	0.15***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Log(Violent Crime)	0.25***	0.28***	0.35***	0.26***	0.25***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Boundary (White) x % White					0.92***
					(0.23)
R^2	0.54	0.53	0.51	0.54	0.54
Num. obs.	6444	6444	6444	6444	6444
N Clusters	649	649	649	649	649

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 5: Influence of Demographic Boundaries on Arrest Intensity (Boston)

	(1)	(2)	(3)	(4)	(5)
Boundary (White)	0.23**				−0.07
	(0.08)				(0.13)
Boundary (Black)		0.59***			
		(0.12)			
Boundary (Latino)			0.20		
			(0.12)		
Boundary (Global)				0.31***	
				(0.08)	
% White	−0.87***				−1.04***
	(0.09)				(0.12)
% Black		0.40***		0.71***	
		(0.09)		(0.10)	
% Latino			0.55***	0.87***	
			(0.11)	(0.12)	
Log(Population)	0.20***	0.20***	0.20***	0.20***	0.20***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	0.00	−0.00	−0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Diversity	−0.19	0.20*	0.05	−0.04	−0.15
	(0.11)	(0.09)	(0.10)	(0.11)	(0.11)
Log(MHHI)	0.05	0.05	0.06	0.05	0.05
	(0.08)	(0.08)	(0.09)	(0.08)	(0.08)
Boundary (Log(MHHI))	0.09*	0.09*	0.05	0.09*	0.10*
	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)
% Homeowner	−0.27*	−0.41**	−0.23	−0.29	−0.29*
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
% Poverty	0.49*	0.54*	0.67**	0.54*	0.47*
	(0.23)	(0.24)	(0.25)	(0.23)	(0.23)
Boundary % Poverty	0.25	0.32*	0.37*	0.23	0.20
	(0.15)	(0.15)	(0.16)	(0.15)	(0.15)
% Unemployed	0.75**	0.79**	1.29***	0.79**	0.68*
	(0.27)	(0.27)	(0.26)	(0.27)	(0.27)
% College	−0.28*	−0.54***	−0.68***	−0.30*	−0.23
	(0.13)	(0.13)	(0.13)	(0.14)	(0.14)
Boundary (White) x % White					0.61**
					(0.20)
R^2	0.44	0.43	0.43	0.44	0.44
Num. obs.	4144	4144	4144	4144	4144
N Clusters	540	540	540	540	540

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$