**Supplementary Online Appendix for:**

**Policing Neighborhood Boundaries and the Racialized Social Control of Spaces**

**Further Details on the Mediation Analysis**

Controlled Direct Effects (CDEs) focus on the causal relationship between a treatment and outcome while fixing a mediator at a particular value for all units (Acharya, Blackwell, and Sen 2016; 2018; Robins 2003; Zhou and Wodtke 2019). While CDEs do not allow us to decompose the total effect of boundaries into the direct and indirect effect through the three mediators, they enable two key interpretations (Acharya et al. 2016, 2018; Zhou and Wodtke 2019). First, a CDE can tell us whether the causal effect of a treatment on the outcome does (zero CDE) or does not (nonzero CDE) solely operate through the mediator. Second, comparing the total effect and the CDE makes it possible to determine the extent to which the mediator accounts for the relationship between the treatment and outcome. The key advantage of CDEs is that they are identified under weaker assumptions.

The estimates are based on regression-based causal mediation analysis using a negative binominal regression for the outcome model (i.e., stop counts) and a linear regression for the mediator model (i.e., the crime measures) with the same set of covariates used in Model 2 (Valeri and VanderWeele 2013). The procedure was originally implemented by Valeri and VanderWeele (2013) and ported to R by Yoshida and collaborators (2020). Our model allows for treatment-mediator interactions and evaluates the conditional effects at the median of all covariates. The CDE of neighborhood boundaries is identified under the assumption of sequential ignorability (Imai et al. 2011; Wang and Sobel 2013). This assumption requires that (a) the main independent variable is conditionally independent of unobserved covariates conditional on observed covariates, and (b) the mediators are independent of unobserved covariates conditional on covariates and the main independent variable. While these assumptions are strong, we believe that the results are informative about the role of crime in explaining the observed relation between neighborhood boundaries and policing.

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| Table A1. Full Regression Output for Model 2, Predicting Number of Stops | |
|  | |
| Boundary Value | 1.078\*\*\* |
|  | (0.255) |
| Prop. Black/Hispanic | 1.786\*\*\* |
|  | (0.086) |
| Prop. Black/Hispanic\*Boundary Value | -1.344\*\*\* |
|  | (0.353) |
| Population | 0.001\*\*\* |
|  | (0.00003) |
| Youth | -0.00005 |
|  | (0.0001) |
| Males | -1.048\*\*\* |
|  | (0.406) |
| Household Size | 1.972\*\*\* |
|  | (0.681) |
| Vacancy Rate | 0.016 |
|  | (0.057) |
| Home Ownership | 2.221\*\*\* |
|  | (0.326) |
| Residential Mobility | -0.252\*\*\* |
|  | (0.095) |
| Population Change | 0.038 |
|  | (0.196) |
| Concentrated Disadvantage | -0.039\*\* |
|  | (0.015) |
| Land Area | 0.00000\*\*\* |
|  | (0.000) |
| Building Height | -0.037\*\*\* |
|  | (0.007) |
| Commercial Zone | 1.745\*\*\* |
|  | (0.164) |
| Light Manufacturing Zone | 1.018\*\*\* |
|  | (0.131) |
| Medium/Heavy Manufacturing Zone | 1.303\*\*\* |
|  | (0.384) |
| Educational Land Use | 1.489\*\*\* |
|  | (0.221) |
| Cemetery Land Use | 0.243 |
|  | (0.365) |
|  |  |
| Parks/Recreational Land Use | 1.292\*\*\* |
|  | (0.198) |
| Public Housing | 2.310\*\*\* |
|  | (0.142) |
| Commercial Overlay | 2.664\*\*\* |
|  | (0.192) |
| Mixed Land Use | 0.098 |
|  | (0.137) |
| Rail | 0.185\*\*\* |
|  | (0.061) |
| River | -0.038 |
|  | (0.086) |
| Major Road | -0.291\*\*\* |
|  | (0.048) |
| Racial Diversity | 0.079 |
|  | (0.125) |
| Constant | 2.686\*\*\* |
|  | (0.393) |
| Observations | 4,604 |
| Log Likelihood | -31,178.400 |
|  | |
| *Note:* Coefficients are expressed as changes in the log of the expected count. Cluster-robust standard errors in parentheses. \*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001 (two-tailed tests). | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | | **Table A2. Negative Binomial Regressions of Police Stops on Racial Boundaries with Census-Tract Fixed Effects and Spatial Lags** | | | | |  | | |  | |  | Model | Model | Model | |  | (2) | (3) | (4) | |  |  |  |  | | Boundary Value | 1.078\*\*\* | 1.104\*\*\* | 0.897\*\*\* | |  | (0.255) | (0.167) | (0.228) | | Prop. Black/Hispanic | 1.786\*\*\* | 1.340\*\*\* | 1.142\*\*\* | |  | (0.086) | (0.175) | (0.236) | | Prop. Black/Hispanic\*Boundary Value | -1.344\*\*\* | -1.257\*\*\* | -0.896\*\* | |  | (0.353) | (0.268) | (0.342) | | Spatial Lag |  |  | 3.401\*\*\* | |  |  |  | (0.855) | | Neighborhood-Level Control Variables | ✔︎ | ✔︎ | ✔︎ | ✔︎ | | Census-Tract Fixed Effects |  | ✔︎ | ✔︎ | | Observations | 4,604 | 4,604 | 4,604 | | Log Likelihood | -31,178.4 | -29,037.1 | -29,028.3 | |  | | |  | | Note: Coefficients are expressed as changes in the log of the expected count. Cluster-robust standard errors in parentheses. See Table 1 and text for a description of neighborhood-level control variables controls. Model 2 duplicates the main results from Table 2 for ease of comparison. \*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001 (two-tailed tests). | | | | |

Table A3. Mediation Analysis: Total, Direct and Controlled Direct Effect of Neighborhood Boundaries on Police Stops (full sample)

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| --- | --- | --- | --- |
|  | Mediator | | |
|  | Violent  Felonies | Property  Felonies | Shootings |
| Total Effect | 0.304\*\*\* | 0.421\*\*\* | 0.368\*\*\* |
|  | (0.084) | (0.089) | (0.088) |
| Natural Direct Effect | 0.244\*\* | 0.325\*\*\* | 0.425\*\*\* |
|  | (0.075) | (0.081) | (0.086) |
| Natural Indirect Effect | 0.060 | 0.096\* | -0.057\* |
|  | (0.037) | (0.038) | (0.028) |
| Proportion Mediated | 0.223 | 0.266\*\* | -0.192 |
|  | (0.117) | (0.091) | (0.112) |
| Controlled Direct Effect | 0.290\*\*\* | 0.347\*\*\* | 0.440\*\*\* |
|  | (0.075) | (0.081) | (0.085) |

*Note:* All models include the control variables as Model 2 in Table 2. The number of observations is 4,604. The table reports the Pure Natural Direct Effect and the Total Natural Indirect Effect so that the interaction between the treatment and mediator is absorbed into the indirect effect. \*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001 (two-tailed tests).

Table A4. Additional Variables Included in Hit Rate Analysis

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| --- | --- |
| **Variable** | **Description** |
| Hit | Outcome. Whether the stop led to a weapon being uncovered. |
| Suspect Race | Factor variable indicating the race of the stopped individual. In main analyses, all Black and Hispanic categories are combined. In a model check, they are analyzed separately. See text for further details. |
| Age | The age of the suspect in years. |
| Weight | The weight of the suspect in pounds. |
| Height | The height of the suspect in feet. |
| Build | Factor variable indicating the suspect’s body type. |
| Time Period | Factor variable indicating the time of stop, the levels of the factor being six 4-hour periods (8pm-12am, etc.). |
| Year | Factor variable indicating the year in which the stop occurred. |
| Radio Run | Whether the stop resulted from the officer responding to a call. |
| Reason for Suspicion:  Furtive Movements; Casing; Fit Description; Suspicious Bulge; Acting as Lookout; Clothes; Carrying Objects; Drug Transaction; Engaging in Violence; Other | Ten separate binary variables, each indicating whether the officer recorded one of the listed items as a reason for making the stop. |
| Additional Stop Circumstance:  Evasive Response; Time Period; Victim/Witness Report; Ongoing Investigation; Associating with Criminal; Sights and Sounds of Crime; Proximity to Crime Location; Change Direction from Officer; Other | Nine separate binary variables, each indicating whether the officer recorded one of the listed items as an additional circumstance they considered when making the stop. |

*Note:* All variables are drawn from UF-250 forms, as reported in the NYPD’s Stop, Question, and Frisk dataset. The hit rate analysis also includes all neighborhood-level independent variables used in Model 2 (see Table 1 for further details).

Figure A1: The Relationship between White-Black and White-Hispanic Boundaries and Number of Stops by Neighborhood Racial Composition

Chart, line chart

Description automatically generated