A Longitudinal Analysis on Changing Demographics and Crime

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Neighborhood Change and Crime

• The relationship between neighborhood change and crime is prominent in previous research
  o Criminological and ecological theories:
    ▪ social disorganization, collective efficacy, concentrated disadvantage, broken windows, gentrification

• An important measure is ethnic heterogeneity
  o Measured: \(1 - [\sum Pi^2]\), \(Pi\) = fraction of the population in a given group (thus, 1 = complete heterogeneity)
  o Previous research: ethnic heterogeneity *increases* crime
    ▪ Varies by context
  o BUT, changes over time (e.g. gentrification): can *decrease* crime
Research Questions

Q1: How is the socio-demographic composition of DC neighborhoods changing?

Q2: Are these change trajectories similar across neighborhoods?

Q3: Do these change trajectories impact the amount of crime that occurs within these neighborhoods?

Q4: Is this impact robust across different measures of crime?
Washington DC Data

• Demographic Data (Block Groups)
  o Wave 1: Census 2000
  o Wave 2: ACS 2005-2009 5yr estimates
  o Wave 3: Census 2010

• Crime Data
  o Metropolitan Police Department (DC) arrest data
  o Point data aggregated to BGs
Research Methods

**Group-Based Trajectory Analysis**

- **Purpose:** Groups units by latent trajectories
- **Application:** Identify block group-level trajectories of socio-demographic change
- **Measure:** ethnic heterogeneity

**Negative Binomial Regression**

- Determine the effect of group membership on crime
- **DV:** 1) total crimes; 2) homicides; 3) robberies; 4) burglaries; 5) thefts; 6) grand theft auto
- **IV:** group membership
- **Controls:** median age, %15-24yrs, %renter-occupied homes, previous crime

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Latent Trajectories of 4 Groups
Mapped Group Membership
# Group Membership on Crime

<table>
<thead>
<tr>
<th>Crime Measure</th>
<th>Group Membership (IRR)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G2: Shifting, Mid-High</td>
<td>G3: Shifting, Mid-Low</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0.814**</td>
<td>0.775***</td>
</tr>
<tr>
<td><strong>Homicide</strong></td>
<td>0.207***</td>
<td>0.221***</td>
</tr>
<tr>
<td><strong>Robbery</strong></td>
<td>0.730**</td>
<td>0.821*</td>
</tr>
<tr>
<td><strong>Burglary</strong></td>
<td>0.633***</td>
<td>0.672***</td>
</tr>
<tr>
<td><strong>Theft</strong></td>
<td>1.000</td>
<td>1.064</td>
</tr>
<tr>
<td><strong>GTA</strong></td>
<td>0.716***</td>
<td>0.660***</td>
</tr>
</tbody>
</table>

Note: Group 1 is the reference category; models also controlled for: total population, median age, percent ages 15-24, percent households rented, and the number of crimes in 2009

*p<.05, **p<.01, ***p<.001
Discussion

• Group trajectories impact crime
  o Groups with increasing/high ethnic heterogeneity = less crime
  o The effect of group membership was robust

• Neighborhood processes are dynamic

• Additional steps
  o Analyze the trajectories of other important neighborhood changes
  o Use other race/ethnicity measures to modify group membership
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