The Spatial Context of Rape:

Findings from a Southern Metropolitan Area

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Rape – Spatial relationship?

- Organization of the community may affect opportunity and likelihood for rape (Belknap, 1992; Maume, 1989)
- Presence of victims—primarily measured as women in the area
- Assumes motivated offenders are present
- Research also suggests that structural elements influence concentration and likelihood of violent crime
Social Disorganization

- Block groups with more social and structural disorganization have higher rates of violent crime

- Heterogeneity -- diversity index
- Transitional population – concentration of renters
- Overcrowding - average household size
Current study

- Model includes elements of routine activities and social disorganization theories
- Predict spatial distribution of rape
- Role of women in the labor force as a potential measure of female guardianship and change in women’s patterns of behavior
Felson and Cohen: Routine Activities

- Motivated offenders – presence of young men, assumed in most RA research
- Suitable targets – concentration of women in labor force
- Lack of capable guardians – PDO offenses
- Opportunities for crime, including rape, increase as these variables converge
Theoretical Model Predicting Rape

- Diversity Index
- Percent of Renters in Neighborhood
- Average Household Size
- Women in the Labor Force (LQ)
- Young Males in Neighborhood (LQ)
- Public Disorder Offenses (LQ)

Rape LQ
Charlotte-Mecklenburg, NC
Profile: Charlotte-Mecklenburg, NC

- Population (Estimate 2008) 1,675,495
- US Census Estimate of Total Area: 242.9 sq. miles
- Median resident age (county) 32.7 years
- Estimated median household income $47,131
- Racial composition
  - White non Hispanic: 55.1%
  - Black: 32.7%
  - Hispanic: 7.4%
  - Other: 3.6%
Rape in Charlotte-Mecklenburg

- Rapes reported to CMPD
- January 2000 to December 2006
- Includes those cleared by arrest, cleared by exception and not cleared
- Total N=2070 rapes
Point Pattern Map: Rapes
Predictor variables

Diversity
Renters
Household size
Women in the labor force
Young males
Public disorder offenses
LISA: Women in the Labor Force
LISA: Young Males
LISA: Public Disorder Offenses
Criterion variables

Measuring Rape

- Raw counts
- Traditional rape rate
- Rape rate for females
- Rape concentration index
- Rape concentration index for females
Concentration Index Calculations

\[ LQ = \frac{\text{Local rape count}}{\text{Local area or local population}} \div \frac{\text{Total rape count}}{\text{Total area or population}} \]
LISA: Rate per Females
There is a network of causal relationships among various factors, including Diversity Index, Women in the Labor Force (LQ), Percent of Renters in Neighborhood, Average Household Size, Young Males in Neighborhood (LQ), Public Disorder Offenses (LQ), and Rape LQ. The relationships are depicted with arrows indicating the direction of influence. The table shows the results of spatial lag models with R² and pseudo-R² values.

**Spatial Lag Models Results**

<table>
<thead>
<tr>
<th>OLS</th>
<th>Sp Lag</th>
</tr>
</thead>
<tbody>
<tr>
<td>R²</td>
<td>Psuedo-R²</td>
</tr>
<tr>
<td>0.669</td>
<td>0.687</td>
</tr>
</tbody>
</table>

**Correlation Coefficients**

- Diversity Index to Women in the Labor Force (LQ): 0.425
- Percent of Renters in Neighborhood to Diversity Index: 0.142
- Average Household Size to Young Males in Neighborhood (LQ): 0.083
- Young Males in Neighborhood (LQ) to Public Disorder Offenses (LQ): 0.350
- Public Disorder Offenses (LQ) to Rape LQ: 0.234
- Women in the Labor Force (LQ) to Public Disorder Offenses (LQ): 0.208
- Rape LQ: Spatial Lag: 0.252
- Spatial Lag to Diversity Index: 0.142
- Spatial Lag to Percent of Renters in Neighborhood: -0.182
- Spatial Lag to Average Household Size: -0.250
- Spatial Lag to Young Males in Neighborhood (LQ): -0.196
- Spatial Lag to Public Disorder Offenses (LQ): 0.458
- Spatial Lag to Rape LQ: -0.128
## OLS Results for Rape Location Quotient

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSTANT</td>
<td>-4.62E-08</td>
<td>0.03005228</td>
<td>-1.54E-06</td>
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<tr>
<td>Diversity Index</td>
<td>-0.06691894</td>
<td>0.03627946</td>
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<td>Household Size</td>
<td>-0.05214216</td>
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<td>-1.604473</td>
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<td>Percent Renters</td>
<td>0.09234043</td>
<td>0.04358607</td>
<td>2.118577</td>
<td>0.0347998</td>
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<tr>
<td>Women in Labor Force</td>
<td>-0.131713</td>
<td>0.05526024</td>
<td>-2.383504</td>
<td>0.0176581</td>
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<td>Public Disorder Offenses</td>
<td>0.7605111</td>
<td>0.05037565</td>
<td>15.0968</td>
<td>0.0000000</td>
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<tr>
<td>Young Male Concentration</td>
<td>0.1462199</td>
<td>0.05749955</td>
<td>2.542975</td>
<td>0.0114022</td>
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</tbody>
</table>
## Rape LQ: Spatial Lag Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>Z-value</th>
<th>Probability</th>
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<tbody>
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<td>Percent Renters</td>
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<td>Young Male Concentration</td>
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<td>Spatial Lag</td>
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Conclusions

- Space matters
- Patterns of female activities
- Need to include measure of presence of offenders
- Structural elements may influence the organization of the measures of routine activities
- Rape is different
  - Rare event
  - Gendered victimology