Stop-N-Rob

A spatial analysis of convenience store robberies in Charlotte-Mecklenburg, NC

Shell station at Woodlawn & Rockford robbed 16 times in 7 years
Charlotte, NC

• A rapidly growing city in North Carolina

• Population in
  – 2000: 659,454
  – 2007: 855,127
  – Growth: 29.7% in seven years

• From 2000 to 2003 (mid-point of the study)
  – Male population increased by 19%
  – Female population increased by 18.2%
  – Females make up 51% of the 2003 population
Total Robberies = 20,568
Open = 15,363 (74.7%)
Arrest = 3,731 (18.1%*)
Exception = 1,474 (7.2%)

*National clearance rate about 25.2% (2006)
Total Stop-N-Robs = 1,434 (7%* of all robberies)
Open = 1,015 (70.8%)
Arrest = 358 (25%)
Exception = 61 (4.2%)

*National rate about 8.3%
HS 1 Brookshire & Hoskins N=33
HS 1 Brookshire & Hoskins N=33
HS 2 Woodlawn & Nations Crossing
N=28
HS 2 Woodlawn & Nations Crossing
N=28
HS 3: Albemarle & Farm Pond N=29
HS 3: Albemarle & Farm Pond N=29
HS 4: Albemarle & Lawyers N=28
HS 4: Albemarle & Lawyers N=28
Sites with multiple hits during the study period

**REPEAT & NEAR-REPEAT PATTERNS**
Repeat & Near-Repeat

• Repeat: the same location being hit multiple times
• Near-Repeat: locations within one-quarter of a mile of a prior being hit
• 1434 separate offenses
• 520 separate locations
• 108 locations with 3 or more within ¼ mile
• 101 locations with 5 or more hits in 7 years
3000 Blk Wilkinson Blvd
3000 Blk Wilkinson Blvd

Hit 18 times in 7 years
3800 Blk Wilkinson Blvd
3800 Blk Wilkinson Blvd

Hit 10 times in 7 years
7900 Blk Idlewild Road
7900 Blk Idlewild Road

Hit 17 times in 7 years
600 Blk E. Woodlawn Rd.
600 Blk E. Woodlawn Rd.

Hit 16 times in 7 years
A robbery network defined by space-time links

SPACE-TIME INTERACTIONS
## Space-Time Interaction

### Space-Time Interaction at 2 miles & 5 days

<table>
<thead>
<tr>
<th></th>
<th>Far</th>
<th>Close</th>
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<tbody>
<tr>
<td>Space</td>
<td>943187</td>
<td>5225</td>
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<tr>
<td>Close</td>
<td>78564</td>
<td>485</td>
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**Chi-square value** = 485  
**Expected value** = 439.31  
**p-value (chi-square dist.)** = 0.01664  
**p-value MC (999 sims)** = 0.023
Space-Time Links
# Space-Time Interaction

## Space-Time Interaction at 1 mile & 5 days

<table>
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<tr>
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<th>TCrit</th>
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<th>Close</th>
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<tr>
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<td>996801</td>
<td>5532</td>
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<tr>
<td>Time</td>
<td>5 days</td>
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<td>24950</td>
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- **Chi-square value** = 178
- **Expected value** = 139.65
- **p-value (chi-square dist.)** = 0.00101
- **p-value MC (999 sims)** = 0.004
Space-Time Links
Space-Time Interaction

Space-Time Interaction at ½ mile & 5 days

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<td>3640</td>
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<tr>
<td>DCrit</td>
<td>2640 feet</td>
<td></td>
</tr>
<tr>
<td>TCrit</td>
<td>5 days</td>
<td></td>
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Chi-square value = 49
Expected value = 30.09
p-value (chi-square dist.) = 0.00094
p-value MC (999 sims) = 0.001
Space-Time Links