Before or After the Bell?
School Context and Neighborhood Effects on Achievement

Paul A. Jargowsky
Mohamed El-Komi
University of Texas at Dallas
Concern about student achievement

- Low income students don’t do as well.
- Low income kids often concentrated in inner city schools.
- For that reason alone, inner city schools would look bad.
- Reason enough to try programs in Jacob and Ludwig paper.
But the situation may be much worse than that…

• School context effects
  – School characteristics
  – Classmates and classroom dynamics

• Neighborhood effects
  – “concentration effects” (Wilson 1987)
  – Role models, value formation, parenting styles

• The downward spiral
School Peer Effects on Educational Achievement

• After accounting for individual, family, and school variables, peer scores affect student outcomes (Argys et al. 1996; Hanushek et al. 2003; Summers and Wolfe 1977; Zimmer and Toma 2000; etc.)

• Most studies find the effect is greatest for lower achieving students
**Neighborhood Effects on Educational Achievement**

- Years of schooling and/or probability of dropping out related to measures of
  - Income or poverty (Datcher 1982)
  - Family structure and welfare receipt (Corcoran et al. 1990)
  - Percent managerial/administrative occupations (Crane 1991)
  - Effect is increasing over time (Crowder and South 2003)
Is there a problem here?

• School and neighborhood characteristics are highly correlated.

• For school environment effects, we should take account of neighborhood effects so as not to “blame” the schools for outside influences.

• When studying neighborhood effects you should also control for school environment effects.

• Should we worry more about negative environments that children are exposed to before or after the school bell rings?
Is it Schools or Neighborhoods?

• Math Scores from 2000 Texas data public school data
  – Control for math and reading scores from 1999 to capture the student’s family background and educational history (value-added models)
  – Student characteristics: race, gender, poverty, etc.
  – School/grade characteristics: turnover, average peer score (2 years ago), % low income in grade

• Neighborhood demographic characteristics from the 2000 Census Data matched to schools by geocoding
  – Neighborhood poverty rate
  – Percent of children in Married-Couple Families (parental supervision)
  – Percent of adults who are college graduates (role models, attitude toward education)
Data Sources

- **Neighborhood data from the U.S. Census, April 15, 2000**
  - Income Data from 1999

1998-1999 School Year
Grade 4,5,6,7
- Prior test scores,
  - Gifted, Special
  - Education, Limited
  - English Proficiency

1999

1999-2000 School Year
Grade 5,6,7,8
- TAAS math, reading
  - Race/Ethnicity, Gender,
  - School Lunch Eligibility

2000
The Data

• Approximately 1.2 million 5th-8th graders enrolled in 4,755 schools in 2000

• We lose some students because:
  – Temporary IDs can’t be matched to a prior year score
  – Student moved in from out of state, private school
  – Exempt, sick, absent on testing day
  – Problematic matches (wrong sex, race, etc.)

• Final count: 822,268 students
Pooling Data Across Grades

<table>
<thead>
<tr>
<th>Grade 1998-1999</th>
<th>Grade 1999-2000</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th</td>
<td>5th</td>
<td>201,967</td>
</tr>
<tr>
<td>5th</td>
<td>6th</td>
<td>204,615</td>
</tr>
<tr>
<td>6th</td>
<td>7th</td>
<td>208,118</td>
</tr>
<tr>
<td>7th</td>
<td>8th</td>
<td>207,568</td>
</tr>
</tbody>
</table>

Total: 822,268
Impact of Peer Characteristics (within school by grade)

From OLS Model including individual and neighborhood variables.
Results: Impact of Alternative Neighborhood Measures on Student Value Added

Note: from separate models with student characteristics and school fixed effects.
## Annual Change in Percentile Rank

<table>
<thead>
<tr>
<th></th>
<th>Neighborhood Score</th>
<th>Student Percentile</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poverty Rate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>15%</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td>High Poverty</td>
<td>45%</td>
<td>47.81</td>
<td>-2.19</td>
</tr>
<tr>
<td><strong>Percent Children in MCF</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>75%</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td>Few MCF</td>
<td>25%</td>
<td>47.56</td>
<td>-2.44</td>
</tr>
<tr>
<td><strong>Percent College Graduates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>27%</td>
<td>50.00</td>
<td></td>
</tr>
<tr>
<td>Few Graduates</td>
<td>9%</td>
<td>48.89</td>
<td>-1.11</td>
</tr>
</tbody>
</table>
Impact of Neighborhood % College Graduates by Race/Ethnicity and Eligibility for Free/Reduced Price Lunch

![Bar chart showing test score impact for different race/ethnicity groups and eligibility statuses.]

- Overall: 0.155
- White: 0.197
- Black: 0.177
- Hispanic*: 0.085
- Asian*: 0.081
- Nat. Am.: 0.125
- Not eligible: 0.181
- Eligible*: 0.071

Test score impact
Conclusions

• Peer and school characteristics do matter.

• Even after accounting for school/peer influence, neighborhood characteristics affect student achievement.

• Unequal communities produce unequal schools and can undermine good programs.

• Students are penalized *twice* by economic segregation.

• Reducing economic segregation is a housing policy, but with important implications for education.