Teacher Unionization and the Level and Distribution of Student Academic Performance

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Teachers’ Unions and Rising Inequality

- The “Great Polarization” has coincided with declining unionization.
- Public sector unions have been the stronghold of unions for decades, though they are under threat due to the Janus decision (and other regulatory/legal changes).
- Declining unionization among teachers may affect their pay and working conditions.
- It might also affect the level of student performance and differences in student performance across groups and neighborhoods.
How do teachers unions affect student performance?

- Negatively, through limitations on the ability to move or fire teachers, or through inflating education costs.
- Positively, by improving pay and working conditions of teachers, retaining effective teachers, raising morale and engagement, providing a “voice” through which they can enhance classroom practices.
What are we adding to this discussion?

- We merge School and Staffing Survey (SASS) data and Stanford Education Data Archive (SEDA) data to produce broad *national* evidence on the effect of teachers unions on student performance.
- We measure the strength of teacher unionization beyond collective bargaining agreements.
- We control for district and community conditions.
The Stanford Education Data Archive

- Provides student performance outcomes – district-level means of achievement test scores for 3rd to 8th grade, disaggregated by race/ethnicity.

- Contains information on schools and communities derived from the National Center for Education Statistics (NCES) Common Core Data and the School Districts Demographic System.
The School and Staffing Survey

- Provides information on teacher unionization at the district level.
- Three kinds of unionization status:
  1. CB: District is covered by a collectively-bargained contract (56% of districts)
  2. MC: District administration and union “meet and confer” about practices and policies, though no formal contract is in place (13% of districts)
  3. NA: There is neither a CB contract nor a “meet-and-confer” agreement in place (31% of districts)
• On average, students have higher scores for Math and English in CB and MC districts than in NA districts:

4th Grade Scores

<table>
<thead>
<tr>
<th>Grade</th>
<th>NAEP Math</th>
<th>NAEP English</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>235</td>
<td>220</td>
</tr>
<tr>
<td>MC</td>
<td>240</td>
<td>225</td>
</tr>
<tr>
<td>NA</td>
<td>230</td>
<td>220</td>
</tr>
</tbody>
</table>

8th Grade NAEP Scores

<table>
<thead>
<tr>
<th>Grade</th>
<th>NAEP Math</th>
<th>NAEP English</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB</td>
<td>285</td>
<td>275</td>
</tr>
<tr>
<td>MC</td>
<td>290</td>
<td>280</td>
</tr>
<tr>
<td>NA</td>
<td>285</td>
<td>275</td>
</tr>
</tbody>
</table>
Our empirical approach

- We link the 2007-08 SASS to the 2008-09 SEDA and the 2011-12 SASS to the 2012-13 SEDA. We treat these as pooled cross-sections.

- We regress test scores, separately by grade and subject (math, English), on CB and MC status and a set of controls to identify unionization effects on student performance.

- We conduct both OLS and Propensity Score Matching (PSM) analyses.
Our empirical approach II

• We run these analyses separately by race/ethnicity.

• We also run separate analyses for very poor, mid-range poor, and less poor districts as well, to identify differences in unionization effects across these kinds of neighborhoods.
## School District Characteristics Vary by Unionization Status

<table>
<thead>
<tr>
<th></th>
<th>CB</th>
<th>MC</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent White Students</td>
<td>77</td>
<td>77</td>
<td>62</td>
</tr>
<tr>
<td>Percent Black Students</td>
<td>8</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Percent Hispanic Students</td>
<td>10</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Revenue Per Pupil</td>
<td>$12,868</td>
<td>$11,942</td>
<td>$10,562</td>
</tr>
<tr>
<td>Percent on Free/ Reduced Price Lunch</td>
<td>43</td>
<td>46</td>
<td>60</td>
</tr>
</tbody>
</table>
Community Characteristics Vary by Unionization Status

<table>
<thead>
<tr>
<th></th>
<th>CB</th>
<th>MC</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Suburban</td>
<td>34</td>
<td>23</td>
<td>15</td>
</tr>
<tr>
<td>Percent Rural</td>
<td>33</td>
<td>42</td>
<td>50</td>
</tr>
<tr>
<td>Percent Single Mother Households</td>
<td>23</td>
<td>23</td>
<td>29</td>
</tr>
<tr>
<td>Poverty Rate (Ages 5-17)</td>
<td>13</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$65,331</td>
<td>$60,956</td>
<td>$48,953</td>
</tr>
</tbody>
</table>
Results – Pooled

• OLS:
  ➢ Math scores are about 1 point higher in CB districts and 1.5 points higher in MC districts, in grades 3-7.
  ➢ English scores are about 1 to 1.5 points higher in MC districts in all grades.

• PSM (CB vs. NA only):
  ➢ Math effects persist only through 6th grade.
  ➢ No English effects found.
Results – Race/Ethnicity Disaggregated

- OLS:
  - White students: Math scores higher in CB and MC districts in all grades. English scores higher in MC districts in all grades.
  - Black students: Math scores higher in CB districts through 4\textsuperscript{th} grade and in MC districts through 6\textsuperscript{th}. English scores higher in MC districts through 6\textsuperscript{th} grade.
  - No effects found for Hispanic and Asian students.

- PSM (CB vs. NA only):
  - White: Math effects persist through 6\textsuperscript{th} grade (no English effects).
  - Black: Math effects persist through 4\textsuperscript{th} grade (no English effects).
  - No effects found for Hispanic and Asian students.
## Results – By Extent of Poverty, OLS

<table>
<thead>
<tr>
<th>High Poverty (Top quartile)</th>
<th>Math</th>
<th>ELA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive MC effects for grades 3 to 5</td>
<td>Positive MC effects for grades 3 to 5; Positive CB effects for grade 6</td>
</tr>
<tr>
<td>Mid-Poverty (Middle 50%)</td>
<td>Positive MC effects for grades 4 to 7; Positive CB effects for grades 3 to 7</td>
<td>Positive MC effects for grades 3 to 8; Positive CB effects for grades 7 and 8</td>
</tr>
<tr>
<td>Low Poverty (Bottom quartile)</td>
<td>Positive CB effects for grade 4</td>
<td>Negative MC effects for grade 6; Negative CB effects for grades 3 and 5</td>
</tr>
</tbody>
</table>
Results – By Extent of Poverty, PSM

- High Poverty: Positive CB effects for grade 4 English
- Mid-Poverty: Positive CB effects for grades 3-6 math and grade 4 English
- Low Poverty: Positive CB effects for grade 4 math
Summary

• The effects of teacher unionization on student performance are generally positive.
• They are somewhat stronger for black students than for white students for 3rd and 4th grades, but effects more persistent in higher grades for whites.
• They are stronger in high-poverty and mid-poverty districts than in low poverty districts.
• They are often manifest in “meet and confer” districts.
Implications and Next Steps

• Studies of teachers’ union effects that focus only on the presence of a CB contract may understate such effects.
• Declining unionization among teachers may have negative impacts on student achievement, especially in high and mid-poverty neighborhoods, suggesting that inequality in education outcomes may increase.
• Variation in these effects (by subject, grade) needs some consideration. More refined characterization of SES status of districts can be examined.