Racial Peer Effects in The Classroom
Evidence From A Randomized Experiment

Daryl Fairweather

Department of Economics
University of Chicago

Intergenerational Mobility Conference, 2012
Outline

1. Motivation

2. Data
   - Tennessee STAR Experimental Design
   - Outcomes

3. Results
   - Main Results
   - Effect from Other Races

4. Conclusion
Motivation

- Previous research on gender and ability based peer effects
- Previous economic research on racial peer effects in schools
  - Did not have randomization
  - Different grades and settings
- Psychologists have found that children as young as 3 years old are conscious of race
- I find that black students perform better when in classes with a higher share of black students (lower share of other races)
- I also find that white students perform better when in classes with a higher share of white students (lower share of other races)
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Setting

- Took place in from 1985-1989 in 79 Tennessee public schools
- Measured the effects of class size on educational outcomes
- Students and teachers were randomly assigned to 3 different class types
  - Small
  - Large
  - Large with teacher aide
- Students were randomly assigned to a classroom type starting in kindergarten
  - That assignment was intended to be maintained through third grade
  - Forty-five percent of STAR students entered in first grade (kindergarten not mandatory in Tennessee)
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### Racial Composition of The Kindergarten Sample

**Table:** Overall Racial Composition of STAR Kindergarten Students

<table>
<thead>
<tr>
<th>Race</th>
<th>Freq.</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>4,234</td>
<td>66.97</td>
</tr>
<tr>
<td>Black</td>
<td>2,058</td>
<td>32.55</td>
</tr>
<tr>
<td>Asian</td>
<td>14</td>
<td>0.22</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5</td>
<td>0.08</td>
</tr>
<tr>
<td>Native American</td>
<td>2</td>
<td>0.03</td>
</tr>
<tr>
<td>other</td>
<td>9</td>
<td>0.14</td>
</tr>
<tr>
<td>Total</td>
<td>6,322</td>
<td>100</td>
</tr>
</tbody>
</table>
Histogram of Share of Classroom that is Black

The Share of Black Students' Classmates that are Black

Density

0
10
20
30
40
0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95 1
Histogram of Share of Classroom that is White

The Share of White Students' Classmates that are White

Density

0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95 1
Sample Variation

**Table:** Within School Means and Standard Deviations of Share Race For the Average School

<table>
<thead>
<tr>
<th></th>
<th>Share Black*</th>
<th>Share White**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average School</td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>38.17%</td>
<td>2.42%</td>
</tr>
<tr>
<td></td>
<td>86.01%</td>
<td>3.68%</td>
</tr>
</tbody>
</table>

*For schools that had at least one black student

**For schools that had at least one white student
Outline

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4 Conclusion
## Percentile Rank of Test Scores By Race

<table>
<thead>
<tr>
<th></th>
<th>Black</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Math</td>
<td>42.27</td>
<td>29.25</td>
</tr>
<tr>
<td>Reading</td>
<td>42.17</td>
<td>28.54</td>
</tr>
</tbody>
</table>
Outline

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Effect on Black Students’ Math Scores

Regression of Black Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Math Test</th>
<th>(2) Percentile Rank on Math Test</th>
<th>(3) Percentile Rank on Math Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Black</td>
<td>39.64* (22.84)</td>
<td>30.63 (23.47)</td>
<td>33.92 (24.05)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>10.43*** (4.005)</td>
<td>10.21** (4.032)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td></td>
<td>6.257 (6.225)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-10.12*** (3.229)</td>
<td>-10.00*** (3.205)</td>
<td>-16.48** (7.480)</td>
</tr>
<tr>
<td>Observations</td>
<td>1.890</td>
<td>1.890</td>
<td>1.890</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.351</td>
<td>0.353</td>
<td>0.353</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status and share female
## Effect on Black Students’ Reading Scores

Regression of Black Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentile Rank</td>
<td>Percentile Rank</td>
<td>Percentile Rank</td>
</tr>
<tr>
<td></td>
<td>Rank on Reading</td>
<td>Rank on Reading</td>
<td>Rank on Reading</td>
</tr>
<tr>
<td></td>
<td>Test</td>
<td>Test</td>
<td>Test</td>
</tr>
<tr>
<td>Share Black</td>
<td>9.684 (20.49)</td>
<td>3.417 (20.43)</td>
<td>5.535 (20.91)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>7.297 (9.372)</td>
<td>7.162 (9.398)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td>4.178 (6.232)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-2.477 (3.424)</td>
<td>-2.400 (3.401)</td>
<td>-6.721 (7.541)</td>
</tr>
<tr>
<td>Observations</td>
<td>1.853 (3.624)</td>
<td>1.853 (3.401)</td>
<td>1.853 (3.512)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.323 (3.325)</td>
<td>0.325 (3.325)</td>
<td>0.325 (3.325)</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status and share female
Effect on White Students’ Math Scores

Regression of White Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Math Test</th>
<th>(2) Percentile Rank on Math Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share White</td>
<td>15.42 (12.78)</td>
<td>16.30 (15.02)</td>
</tr>
<tr>
<td>All White Class</td>
<td>-0.257 (1.844)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>74.42*** (4.982)</td>
<td>74.28*** (5.057)</td>
</tr>
<tr>
<td>Observations</td>
<td>3,935</td>
<td>3,935</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.209</td>
<td>0.209</td>
</tr>
<tr>
<td>Robust standard errors in parentheses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*** p&lt;0.01, ** p&lt;0.05, * p&lt;0.1</td>
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### Regression of White Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Reading Test</th>
<th>(2) Percentile Rank on Reading Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share White</td>
<td>27.40** (11.30)</td>
<td>30.76** (13.00)</td>
</tr>
<tr>
<td>All White Class</td>
<td>-0.982 (1.769)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>63.89*** (7.587)</td>
<td>63.32*** (7.667)</td>
</tr>
<tr>
<td>Observations</td>
<td>3,890</td>
<td>3,890</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.290</td>
<td>0.290</td>
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Effect on Black Students’ Scores by Each Race

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<th>(2) Percentile Rank on Reading Test</th>
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<tbody>
<tr>
<td>Share White</td>
<td>-32.11 (24.82)</td>
<td>-4.924 (22.30)</td>
</tr>
<tr>
<td>Share Asian</td>
<td>-255.4*** (68.20)</td>
<td>-127.5*** (36.06)</td>
</tr>
<tr>
<td>Share Hispanic</td>
<td>-264.4*** (72.35)</td>
<td>-61.23 (170.7)</td>
</tr>
<tr>
<td>Share Native American</td>
<td>-363.3** (164.4)</td>
<td>-128.7 (145.1)</td>
</tr>
<tr>
<td>Constant</td>
<td>67.66*** (22.54)</td>
<td>46.90** (20.85)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,890</td>
<td>1,853</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.354</td>
<td>0.325</td>
</tr>
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All specifications control for classroom type, gender, free lunch status, and share female

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Racial Peer Effects in The Classroom
## Effect on White Students’ Scores by Each Race

Regression of White Kindergarten Students, Omitting Schools Large Enough to Have Non-Random Assignment, With School Fixed Effects and Clustered at the Classroom Level

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<tbody>
<tr>
<td>Share Black</td>
<td>-8.883</td>
<td>-26.41*</td>
</tr>
<tr>
<td></td>
<td>(15.20)</td>
<td>(13.52)</td>
</tr>
<tr>
<td>Share Asian</td>
<td>-66.16</td>
<td>-35.05</td>
</tr>
<tr>
<td></td>
<td>(49.50)</td>
<td>(43.82)</td>
</tr>
<tr>
<td>Share Hispanic</td>
<td>-127.2***</td>
<td>-59.21*</td>
</tr>
<tr>
<td></td>
<td>(33.04)</td>
<td>(33.59)</td>
</tr>
<tr>
<td>Share Native American</td>
<td>-129.1**</td>
<td>-78.02</td>
</tr>
<tr>
<td></td>
<td>(54.46)</td>
<td>(62.13)</td>
</tr>
<tr>
<td>Constant</td>
<td>82.22***</td>
<td>90.26***</td>
</tr>
<tr>
<td></td>
<td>(15.80)</td>
<td>(14.19)</td>
</tr>
<tr>
<td>Observations</td>
<td>3.935</td>
<td>3.890</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.210</td>
<td>0.290</td>
</tr>
</tbody>
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Robust standard errors in parentheses

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All specifications control for classroom type, gender, free lunch status, and share female
Non-Cognitive Effects on Black Students

Regression of Black Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

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<thead>
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<th>VARIABLES</th>
<th>(1) Days Absent</th>
<th>(2) Motivation Percentile Rank</th>
<th>(3) Listening Percentile Rank</th>
<th>(4) Repeat Kindergarten</th>
<th>(5) Self Concept Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Black</td>
<td>7.717**</td>
<td>19.21</td>
<td>35.18*</td>
<td>-0.221**</td>
<td>23.52</td>
</tr>
<tr>
<td></td>
<td>(3.051)</td>
<td>(22.74)</td>
<td>(18.51)</td>
<td>(0.112)</td>
<td>(24.58)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.962</td>
<td>12.97</td>
<td>-4.109</td>
<td>0.00824</td>
<td>17.30**</td>
</tr>
<tr>
<td></td>
<td>(1.263)</td>
<td>(9.113)</td>
<td>(3.331)</td>
<td>(0.0215)</td>
<td>(8.683)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,029</td>
<td>1,659</td>
<td>1,882</td>
<td>2,051</td>
<td>1,659</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.073</td>
<td>0.042</td>
<td>0.242</td>
<td>0.112</td>
<td>0.062</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

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All specifications control for classroom type, gender, free lunch
### Non-Cognitive Effects on White Students

Regression of White Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

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<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Days Absent</th>
<th>(2) Motivation Percentile Rank</th>
<th>(3) Listening Percentile Rank</th>
<th>(4) Repeat Kindergarten</th>
<th>(5) Self Concept Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share White</td>
<td>-0.709</td>
<td>8.559</td>
<td>18.01**</td>
<td>0.0915*</td>
<td>1.701</td>
</tr>
<tr>
<td></td>
<td>(2.995)</td>
<td>(11.30)</td>
<td>(7.632)</td>
<td>(0.0544)</td>
<td>(13.06)</td>
</tr>
<tr>
<td>Constant</td>
<td>9.481***</td>
<td>62.50***</td>
<td>43.63***</td>
<td>0.00436</td>
<td>55.69***</td>
</tr>
<tr>
<td></td>
<td>(2.917)</td>
<td>(5.035)</td>
<td>(3.551)</td>
<td>(0.0204)</td>
<td>(5.416)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.085</td>
<td>0.035</td>
<td>0.153</td>
<td>0.057</td>
<td>0.065</td>
</tr>
</tbody>
</table>

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All specifications control for classroom type, gender, free lunch
Implications

- Are these effects driven by changes in student behavior or teacher behavior?
  - Teachers may give more attention to a race, when more of that race is present
  - Students may be bullied more when they are in the minority
  - Students may view themselves differently when they are in the minority

- There are benefits to keeping schools and classrooms homogenous with regard to race

- Programs that alter the racial composition of a student’s school should take racial peer effects into account
  - Charter Schools
  - Magnet Schools
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Effect on Black Students’ Math Scores
Controlling for Teacher Characteristics

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<th>(2) Percentile Rank on Math Test</th>
<th>(3) Percentile Rank on Math Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Black</td>
<td>40.54* (22.94)</td>
<td>25.13 (22.74)</td>
<td>25.76 (23.78)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>16.56*** (4.047)</td>
<td>16.54*** (4.057)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td>0.797 (5.329)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>34.65** (16.93)</td>
<td>36.53** (16.12)</td>
<td>35.90** (17.00)</td>
</tr>
<tr>
<td>Observations</td>
<td>1.622</td>
<td>1.622</td>
<td>1.622</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.399</td>
<td>0.403</td>
<td>0.403</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race
Effect on Black Students’ Reading Score
Controlling for Teacher Characteristics

Regression of Black Kindergarten Students, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Reading Test</th>
<th>(2) Percentile Rank on Reading Test</th>
<th>(3) Percentile Rank on Reading Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Black</td>
<td>17.57 (26.86)</td>
<td>10.10 (26.27)</td>
<td>13.03 (27.05)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>8.112 (11.77)</td>
<td>8.024 (11.76)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td></td>
<td>3.889 (6.833)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>22.08 (18.44)</td>
<td>50.56*** (16.91)</td>
<td>48.72*** (18.28)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,589</td>
<td>1,589</td>
<td>1,589</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.381</td>
<td>0.382</td>
<td>0.382</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race
**Effect on White Students’ Math Scores\(^\text{a}\)**

*Controlling for Teacher Characteristics*

---

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Math Test</th>
<th>(2) Percentile Rank on Math Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share White</td>
<td>11.65</td>
<td>3.911</td>
</tr>
<tr>
<td></td>
<td>-14.53</td>
<td>-17.42</td>
</tr>
<tr>
<td>All White Class</td>
<td>1.953</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2.048</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>88.48***</td>
<td>87.82***</td>
</tr>
<tr>
<td></td>
<td>-10.38</td>
<td>-10.56</td>
</tr>
<tr>
<td>Observations</td>
<td>3,643</td>
<td>3,643</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.244</td>
<td>0.244</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher
Effect on Black Students’ Math Scores
Excluding Schools That had the Opportunity to Assign to Classrooms Non-Randomly

Regression of Black Kindergarten Students’ Math Scores Omitting Schools Large Enough to Have Non-Random Classroom Assignment, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentile Rank on Math Test</td>
<td>Percentile Rank on Math Test</td>
<td>Percentile Rank on Math Test</td>
</tr>
<tr>
<td>Share Black</td>
<td>34.91 (47.40)</td>
<td>-109.6** (42.51)</td>
<td>-120.7** (51.37)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>34.99*** (6.095)</td>
<td>35.78*** (5.801)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td>-2.593 (10.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>78.84*** (8.984)</td>
<td>81.05*** (8.107)</td>
<td>97.78*** (14.45)</td>
</tr>
<tr>
<td>Observations</td>
<td>567</td>
<td>567</td>
<td>567</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.523</td>
<td>0.533</td>
<td>0.533</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race
## Effect on Black Students’ Reading Scores
Excluding Schools That had the Opportunity to Assign to Classrooms Non-Randomly

Regression of Black Kindergarten Students, Ommitting Schools Large Enough to Have Non-Random Assignment, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Reading Test</th>
<th>(2) Percentile Rank on Reading Test</th>
<th>(3) Percentile Rank on Reading Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Black</td>
<td>190.5*** (50.00)</td>
<td>92.07 (69.83)</td>
<td>110.6 (77.50)</td>
</tr>
<tr>
<td>All Black Class</td>
<td>23.82*** (7.478)</td>
<td>22.48*** (7.948)</td>
<td></td>
</tr>
<tr>
<td>Only Black Student</td>
<td></td>
<td>4.348 (9.372)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>26.60 (22.03)</td>
<td>39.23** (19.38)</td>
<td>27.88 (25.55)</td>
</tr>
<tr>
<td>Observations</td>
<td>565</td>
<td>565</td>
<td>565</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.460</td>
<td>0.465</td>
<td>0.465</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race
## Effect on White Students’ Math Scores
Excluding Schools That had the Opportunity to Assign to Classrooms Non-Randomly

Regression of White Kindergarten Students, Omitting Schools Large Enough to Have Non-Random Assignment, With School Fixed Effects and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentile Rank on Math Test</td>
<td>Percentile Rank on Math Test</td>
</tr>
<tr>
<td>Share White</td>
<td>29.10</td>
<td>-6.055</td>
</tr>
<tr>
<td></td>
<td>(29.43)</td>
<td>(25.05)</td>
</tr>
<tr>
<td>All White Class</td>
<td>10.10***</td>
<td>(3.391)</td>
</tr>
<tr>
<td>Constant</td>
<td>75.45***</td>
<td>97.94***</td>
</tr>
<tr>
<td></td>
<td>(20.18)</td>
<td>(18.91)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,453</td>
<td>1,453</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.275</td>
<td>0.280</td>
</tr>
</tbody>
</table>
| Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher
Effect on White Students’ Reading Scores
Excluding Schools That had the Opportunity to Assign to Classrooms Non-Randomly

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percentile Rank on Reading Test</td>
<td>Percentile Rank on Reading Test</td>
</tr>
<tr>
<td>Share White</td>
<td>45.68 (27.54)</td>
<td>38.76 (25.44)</td>
</tr>
<tr>
<td>All White Class</td>
<td>1.993 (3.366)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>14.96 (15.90)</td>
<td>30.13** (15.04)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,441 (1,441)</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.365 (0.365)</td>
<td></td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race.
# Effect on White Students’ Reading Scores

Controlling for Teacher Characteristics

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Percentile Rank on Reading Test</th>
<th>(2) Percentile Rank on Reading Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share White</td>
<td>26.13**</td>
<td>30.38**</td>
</tr>
<tr>
<td></td>
<td>-12.04</td>
<td>-13.57</td>
</tr>
<tr>
<td>All White Class</td>
<td></td>
<td>-1.078</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-2.033</td>
</tr>
<tr>
<td>Constant</td>
<td>50.65***</td>
<td>50.73***</td>
</tr>
<tr>
<td></td>
<td>-8.885</td>
<td>-10.34</td>
</tr>
<tr>
<td>Observations</td>
<td>3,614</td>
<td>3,614</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.315</td>
<td>0.315</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

All specifications control for classroom type, gender, free lunch status, share female, teacher gender, teacher career level, teacher education, teacher experience and teacher race
### Math Test Score:

<table>
<thead>
<tr>
<th></th>
<th>Black</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>473.42</td>
<td>48.74</td>
</tr>
<tr>
<td>First Grade</td>
<td>511.81</td>
<td>38.41</td>
</tr>
</tbody>
</table>

### Reading Test Score:

<table>
<thead>
<tr>
<th></th>
<th>Black</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
</tr>
<tr>
<td>Kindergarten</td>
<td>428.92</td>
<td>28.76</td>
</tr>
<tr>
<td>First Grade</td>
<td>496.14</td>
<td>44.53</td>
</tr>
</tbody>
</table>
### Effect on Black Kindergarten Students’ Raw Test Scores

**Table:** Regression of Black Kindergarten Students, With School Fixed Effects, Controlling for Classroom Type and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math Score</td>
<td>Reading Score</td>
<td>Math Score</td>
<td>Reading Score</td>
</tr>
<tr>
<td></td>
<td>(Base Line)</td>
<td>(Base Line)</td>
<td>(Base Line)</td>
<td>(Base Line)</td>
</tr>
<tr>
<td>Share Black</td>
<td>72.19*</td>
<td>2.295</td>
<td>88.47**</td>
<td>14.454</td>
</tr>
<tr>
<td></td>
<td>(37.61)</td>
<td>(20.36)</td>
<td>(37.19)</td>
<td>(27.52)</td>
</tr>
<tr>
<td>Constant</td>
<td>475.0***</td>
<td>442.8***</td>
<td>441.1***</td>
<td>397.2***</td>
</tr>
<tr>
<td></td>
<td>(1.567)</td>
<td>(3.401)</td>
<td>(26.18)</td>
<td>(19.71)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,895</td>
<td>1,858</td>
<td>1,622</td>
<td>1,589</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.320</td>
<td>0.268</td>
<td>0.404</td>
<td>0.369</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Specifications (3) and (4) control for: free lunch status, gender, teacher race, teacher’s highest degree, teacher’s career level, teacher’s years of experience, teacher gender and share of females in the class.
Effect on White Kindergarten Students’ Raw Test Scores

**Table:** Regression of White Kindergarten Students, With School Fixed Effects, Controlling for Classroom Type and Clustered at the Classroom Level

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VARIABLES</strong></td>
<td>Math Score (Base Line)</td>
<td>Reading Score (Base Line)</td>
<td>Math Score</td>
<td>Reading Score</td>
</tr>
<tr>
<td><strong>Share White</strong></td>
<td>19.29</td>
<td>26.52*</td>
<td>6.427</td>
<td>20.87</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>543.9***</td>
<td>454.1***</td>
<td>532.2***</td>
<td>428.58***</td>
</tr>
<tr>
<td></td>
<td>(6.600)</td>
<td>(0.985)</td>
<td>(19.51)</td>
<td>(8.209)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>3,948</td>
<td>3,903</td>
<td>3,655</td>
<td>3,626</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.158</td>
<td>0.187</td>
<td>0.194</td>
<td>0.213</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Specifications (3) and (4) control for: free lunch status, gender, teacher race, teacher’s highest degree, teacher’s career level, teacher’s years of experience, teacher gender and share of females in the class.
# Non-Cognitive Effects in Kindergarten (Raw)

**Table:** Regression of Black Kindergarten Students, With School Fixed Effects, Controlling for Kindergarten Classroom Type and Clustered at the Kindergarten Classroom Level

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLES</td>
<td>Days Absent</td>
<td>Motivation Score</td>
<td>Listening Score</td>
<td>Repeat Kindergarten</td>
</tr>
<tr>
<td>Share Black</td>
<td>8.122**</td>
<td>1.827</td>
<td>36.49*</td>
<td>-0.217*</td>
</tr>
<tr>
<td></td>
<td>(3.187)</td>
<td>(1.889)</td>
<td>(22.03)</td>
<td>(0.114)</td>
</tr>
<tr>
<td>Constant</td>
<td>12.30***</td>
<td>25.04**</td>
<td>470.70***</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.303)</td>
<td>(153.9)</td>
<td>(1.912)</td>
<td>(0.010)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,029</td>
<td>1,664</td>
<td>1,887</td>
<td>2,051</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.065</td>
<td>0.043</td>
<td>0.202</td>
<td>0.105</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1
Non-Cognitive Effects in Kindergarten (Raw)

**Table:** Regression of White Kindergarten Students, With School Fixed Effects, Controlling for Kindergarten Classroom Type and Clustered at the Kindergarten Classroom Level

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLES</td>
<td>Days Absent</td>
<td>Motivation Score</td>
<td>Listening Score</td>
<td>Repeat Kindergarten Score</td>
<td>Self Concept Score</td>
</tr>
<tr>
<td>Share White</td>
<td>-0.750</td>
<td>.2753</td>
<td>15.19</td>
<td>0.095*</td>
<td>-0.600</td>
</tr>
<tr>
<td></td>
<td>(3.013)</td>
<td>(0.888)</td>
<td>(10.963)</td>
<td>(0.056)</td>
<td>(2.133)</td>
</tr>
<tr>
<td>Constant</td>
<td>23.49***</td>
<td>25.90**</td>
<td>536.02***</td>
<td>-0.005</td>
<td>57.33***</td>
</tr>
<tr>
<td></td>
<td>(0.278)</td>
<td>(0.546)</td>
<td>(1.123)</td>
<td>(0.328)</td>
<td>(1.049)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,189</td>
<td>3,349</td>
<td>3,921</td>
<td>4,215</td>
<td>3,349</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.069</td>
<td>0.0297</td>
<td>0.094</td>
<td>0.035</td>
<td>0.050</td>
</tr>
</tbody>
</table>

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1