The Effectiveness of Secondary Math Teachers from Teach For America and the Teaching Fellows Programs

APPAM, November 8, 2013

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Overview of Presentation

- Background
- Study design and data collection
- Characteristics of study teachers
- Effectiveness of TFA teachers
- Effectiveness of Teaching Fellows
Background
Teacher Shortages in High-Poverty Schools

- Alternative routes to teacher certification
  - Seek to reduce barriers to entering the profession
  - Typically require less coursework than traditional certification programs, less or no student teaching
  - Vast majority no more selective than typical traditional certification program

- TFA and Teaching Fellows Programs are highly selective alternative routes
  - Admit less than 15 percent of all applicants
  - By far the largest highly selective alternative routes
Follow similar models
- Recruit and select high-achieving individuals
- Provide 5 to 7 weeks of training in summer
- Place in high-poverty schools, hard-to-staff subjects
- Provide ongoing training and support

Programs differ in some ways
- TFA recruits mainly recent college graduates; Teaching Fellows programs recruit mainly professionals
- TFA requires two-year commitment; Teaching Fellows programs expect long-term commitment
Common Criticisms of TFA and Teaching Fellows

- TFA and Teaching Fellows teachers are under-prepared for teaching relative to teachers from traditional routes.
- Because TFA requires only a two-year commitment, TFA teachers often leave the profession before gaining valuable experience.
Compared with other teachers teaching the same math courses in the same schools...

1. How effective are secondary math teachers from TFA?
2. How effective are secondary math teachers from the Teaching Fellows programs?
Randomly assigned students to teachers within same school and math course
- Class taught by TFA or Teaching Fellows teacher
- Class taught by “comparison teacher” who entered teaching via either alternative or traditional route
  - No limits on teacher experience

Compare student math scores at end of year to estimate teacher effectiveness
- Can’t compare effectiveness of TFA and Teaching Fellows teachers
Large Samples, Comprehensive Data Collection

- **TFA analysis sample**
  - 4,573 students, 136 teachers, 45 schools, 11 districts, 8 states

- **Teaching Fellows analysis sample**
  - 4,116 students, 153 teachers, 44 schools, 9 districts, 8 states

- **Data collection**
  - **Student math achievement**
    - State tests for middle school students
    - Study-administered, subject-specific tests for high school students (algebra I, II, geometry)
  - **Teacher characteristics**
    - Survey of background and preparation
    - Praxis II math scores to measure math content knowledge
Characteristics of Study Teachers
Relative to comparison teachers, TFA and Teaching Fellows teachers:

- Younger and more likely to be white
- More likely to have attended a selective college
- Have less teaching experience
- Less likely to have a math degree, but scored higher on Praxis II math assessment
- More likely to have taken coursework during study year (TFA only)
Effectiveness of TFA Teachers
TFA Teachers More Effective Than Comparison Teachers

Difference in effectiveness (in standard deviations of test scores)

- TFA vs. all comparison teachers: 0.07**
- TFA vs. teachers from traditional routes: 0.06**
- TFA vs. teachers from less selective alternative routes: 0.09**

Difference is statistically significant at 5% (*) or 1% (**) level.
Novice TFA Teachers More Effective Than Both Novice and Experienced Comparison Teachers

Difference in effectiveness (in standard deviations of test scores)

0.16
0.12
0.08
0.04
0
-0.04
-0.08

Novice TFA vs. novice comparison teachers

Novice TFA vs. experienced comparison teachers

0.08**
0.07**

Difference is statistically significant at 5% (*) or 1% (**) level.
Effectiveness of Teaching Fellows
Teaching Fellows Just as Effective as Comparison Teachers, and in Some Cases More Effective

Difference in effectiveness (in standard deviations of test scores)

- Teaching Fellows vs. all comparison teachers
- Teaching Fellows vs. teachers from traditional routes
- Teaching Fellows vs. teachers from less selective alternative routes

Difference is statistically significant at 5% (*) or 1% (**) level.
Novice Teaching Fellows More Effective Than Novice Comparison Teachers

Difference in effectiveness (in standard deviations of test scores)

Novice Teaching Fellows vs. novice comparison teachers

Experienced Teaching Fellows vs. experienced comparison teachers

Difference is statistically significant at 5% (*) or 1% (**) level.
Summary of Findings

- TFA and Teaching Fellows programs can increase the supply of effective secondary math teachers in high-poverty schools
  - TFA teachers outperformed comparison teachers even when the comparison teachers were more experienced
  - Teaching Fellows were at least as effective as comparison teachers, and in some circumstances more effective
For More Information

- See the study report on the IES website: http://ies.ed.gov/ncee/pubs/20134015/

- Contact Melissa Clark: mclark@mathematica-mpr.com
Additional Slides
Demographics and Experience

<table>
<thead>
<tr>
<th></th>
<th>TFA Sample</th>
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<th>Teaching Fellows Sample</th>
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<tbody>
<tr>
<td></td>
<td>TFA Teachers</td>
<td>Comparison Teachers</td>
<td>Teaching Fellows</td>
</tr>
<tr>
<td>Average Age</td>
<td>25</td>
<td>38**</td>
<td>33</td>
</tr>
<tr>
<td>% Female</td>
<td>61</td>
<td>79*</td>
<td>54</td>
</tr>
<tr>
<td>% White</td>
<td>89</td>
<td>30**</td>
<td>71</td>
</tr>
<tr>
<td>Years of Work Experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-teaching</td>
<td>0</td>
<td>3**</td>
<td>5</td>
</tr>
<tr>
<td>Teaching</td>
<td>2</td>
<td>10**</td>
<td>4</td>
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</table>

Difference between TFA and comparison teachers or Teaching Fellows and comparison teachers statistically significant at the 1% (**) or 5% (*) level, two-tailed test.
## Education and Content Knowledge

<table>
<thead>
<tr>
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<tr>
<td></td>
<td>TFA Teachers</td>
<td>Comparison Teachers</td>
<td>Teaching Fellows</td>
<td>Comparison Teachers</td>
</tr>
<tr>
<td>% from Selective College</td>
<td>81</td>
<td>23**</td>
<td>72</td>
<td>34**</td>
</tr>
<tr>
<td>% with Math Major</td>
<td>8</td>
<td>26*</td>
<td>25</td>
<td>43*</td>
</tr>
<tr>
<td>% with Graduate Degree</td>
<td>41</td>
<td>70**</td>
<td>83</td>
<td>80</td>
</tr>
<tr>
<td># College-Level Math Courses</td>
<td>5</td>
<td>8**</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Average Praxis Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle School Math</td>
<td>180</td>
<td>158**</td>
<td>187</td>
<td>170**</td>
</tr>
<tr>
<td>High School Math</td>
<td>162</td>
<td>140*</td>
<td>158</td>
<td>139**</td>
</tr>
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Difference between TFA and comparison teachers or Teaching Fellows and comparison teachers statistically significant at the 1% (**) or 5% (*) level, two-tailed test.
## Training and Support

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<th>Teaching Fellows Sample</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>TFA Teachers</td>
<td>Comparison Teachers</td>
<td>Teaching Fellows</td>
<td>Comparison Teachers</td>
</tr>
<tr>
<td>Days Student Teaching</td>
<td>18</td>
<td>25</td>
<td>11</td>
<td>38**</td>
</tr>
<tr>
<td>Hours Math Pedagogy</td>
<td>35</td>
<td>37</td>
<td>49</td>
<td>48</td>
</tr>
<tr>
<td>Took Coursework During Study Year (%)</td>
<td>50</td>
<td>21**</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Had Mentor During Study Year (%)</td>
<td>67</td>
<td>29**</td>
<td>23</td>
<td>17</td>
</tr>
</tbody>
</table>

Difference between TFA and comparison teachers or Teaching Fellows and comparison teachers statistically significant at the 1% (**) or 5% (*) level, two-tailed test.
TFA Teachers More Effective in Both Middle and High School

Difference in Effectiveness
(in standard deviations of test scores)

<table>
<thead>
<tr>
<th></th>
<th>Middle School</th>
<th>High School</th>
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</thead>
<tbody>
<tr>
<td>TFA vs. all</td>
<td>0.06**</td>
<td>0.13**</td>
</tr>
<tr>
<td>comparison teachers, middle school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFA vs. all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>comparison teachers, high school</td>
<td></td>
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</tr>
</tbody>
</table>

Difference is statistically significant at the 5 percent (*) or 1 percent (**) level.
Teaching Fellows No More Effective Than Comparison Teachers in Either Middle or High School

Difference in Effectiveness (in standard deviations of test scores)

Teaching Fellows vs. all comparison teachers, middle school: 0.04
Teaching Fellows vs. all comparison teachers, high school: -0.02

Difference is statistically significant at the 5 percent (*) or 1 percent (**) level
Examined a range of teacher characteristics
  - Selectivity of college, college courses taken, math content knowledge, student teaching experience, coursework

With a few exceptions, none of the characteristics examined predicted teacher effectiveness
  - Teaching experience and content knowledge at high school level associated with increased effectiveness
  - Coursework taken while teaching associated with decreased effectiveness
Observed Factors Do Not Explain TFA Impact

- **Math content knowledge**
  - Accounts for only 16 percent of impact

- **Coursework taken during school year**
  - Coursework negatively associated with effectiveness, but TFA teachers took *more* coursework
  - Cannot explain TFA impact

- **Teaching experience**
  - Positively associated with effectiveness, but TFA teachers had *less* experience
  - Cannot explain TFA impact