

# Academic Competencies and Teacher Effectiveness

Tim Sass

Department of Economics

Andrew Young School of Policy Studies

Georgia State University

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# Overview

- What do we know about the relationship between academic qualifications of prospective teachers and their later effectiveness in the classroom?
  - Direct evidence
    - College entrance exam scores
    - Principal surveys
    - Teacher exam scores
    - College major
  - Indirect evidence
    - Academic qualifications and performance of alternatively certified teachers

# College Entrance Exam Scores and Teacher Productivity

- Little direct evidence of a link between pre-college test scores and teacher effectiveness
  - Ferguson and Ladd (1996)
    - Find *school-level* average composite scores on the American College Test (ACT) are correlated with student performance in Alabama
  - Harris and Sass (2011)
    - Controlling for college coursework, pre-college SAT scores not significantly correlated with *individual* teacher value-added in Florida

# Principal Surveys and Teacher Productivity

- Harris and Sass (2014)
  - Using data from one mid-sized Florida district, find a teacher's value added in math is significantly correlated with their principal's evaluation of the teacher's knowledge/skills/intelligence
    - Not so in reading, where value-added is significantly related to motivation/enthusiasm, but not knowledge/skills/intelligence

# Certification Exams and Teacher Productivity

- Generally significant, but small effects of Praxis exam scores on student achievement
  - Clotfelter, Ladd and Vigdor (2006)
    - One standard deviation increase in licensure exam score in North Carolina is associated with a 0.011 – 0.015 increase in student test scores in math and 0.003-0.004 increase in reading student test scores at the elementary level
    - Goldhaber (2007) finds similar effects
  - Clotfelter, et al. (2010)
    - Overall, find a one standard deviation increase in Praxis II test score is associated with a 0.007 increase in student achievement at the high school level
      - Analysis of subject-specific exams yields stronger results for math (0.047), but a negative relationship for English (-0.021)

# Certification Exams and Teacher Productivity

- Generally significant, but small effects of Praxis exam scores on student achievement
  - Shuls and Trivitt (2013) study the relationship between Praxis scores of teachers and student achievement test scores in Arkansas
    - Results very similar to previous work in North Carolina
      - In math, effects range from 0.010 to 0.015
      - In ELA, effects range from 0.007 to 0.008

# Certification Exams and Teacher Productivity

- Results for other exams not as strong
  - Buddin and Zamarro (2009) find little evidence that higher scores on California licensure exams are associated with higher value-added of teachers in Los Angeles
    - In some cases, relationship is negative

# The Effects of Pre-Service Training on Teacher Productivity

- College Major
  - Betts, et al. (2003)
    - Mixed results for teachers in San Diego
  - Aaronson, et al. (2007)
    - No effect for HS teachers in Chicago
  - Harris and Sass (2011)
    - College major explains little of the variation in teacher effectiveness in Florida
    - Generally very mixed results



# The Effects of Pre-Service Training on Teacher Productivity

- Coursework
  - Harris and Sass (2011)
    - Estimate effects of various types of coursework, including pedagogy, classroom practice and subject content courses
    - Generally find no correlation; when significant, results are mixed
  - Feng and Sass (2013)
    - Coursework in exceptional childhood education positively correlated with value-added for special education teachers (but not for regular ed. teachers)

# Alternative Certification and Teacher Productivity

- Relative performance of Teach-for-America (TFA) teachers
  - Quasi-Experimental Evidence
    - Boyd, et al. (2006); Kane, Rockoff and Staiger (2006) study elementary and middle school teachers in NYC
      - TFA teachers more effective in math initially, particularly at the middle school level
    - Xu, Hannaway and Taylor (2011) analyze effectiveness of TFA teachers in North Carolina high schools
      - TFA teachers more effective on average over all subjects, biggest difference in science and math

# Pre-Preparation Qualifications and Teacher Productivity

- Relative performance of Teach-for-America (TFA) teachers
  - Experimental Evidence
    - Glazerman, Mayer and Decker (2006)
      - Compare TFA and traditionally prepared teachers teaching in same school and grade with random assignment of students
      - Find TFA teachers outperform traditionally prepared teachers in math, but no significant difference in reading

# Pre-Preparation Qualifications and Teacher Productivity

- Relative performance of American Board for Certification of Teacher Excellence (ABCTE) teachers
  - Sass (2015)
    - Compare traditionally prepared teachers with those from alternate routes in Florida
    - Find ABCTE teachers (who are not required to take any coursework in education) have much better pre-service qualifications and significantly outperform traditionally prepared teachers
      - SAT scores 140 points higher, on average
      - Difference of 0.06 standard deviations in student achievement in math and 0.02 in reading

# Summary

- All evidence suggests that the academic ability of teachers matters more in math than in reading/ELA
  - Principal ratings of math teachers tied to teacher's knowledge/skills/intelligence, but not so for reading
  - Association between Praxis scores and student achievement much stronger in math than in reading
  - Relative performance of alternatively certified teachers with strong academic skills (TFA and ABCTE) higher in math than in reading

# Summary

- Currently, little evidence of a link between teacher pre-college academic ability and teacher effectiveness
  - The few existing studies show no significant relationship between entrance exam scores and teacher effectiveness
- No consistent relationship found between college major or specific coursework and teacher effectiveness
  - Limited number of studies

# Summary

- Direct evidence of a (small) positive relationship between post-college academic competency and teacher effectiveness
  - Effects of Praxis scores on student test scores are statistically significant, but small
- Indirect evidence from TFA that teachers with strong academic credentials do well, particularly in math and science at the high school level

# Implications for Teacher Preparation Programs

- Raising admission standards likely to yield better math teachers, particularly in middle and high school
- Not clear what the effect of more rigorous standards would be for reading/language arts teachers
- No guidance for the academic content of preparation programs