DO HIGH-STAKES PLACEMENT EXAMS PREDICT COLLEGE SUCCESS?*

Judith Scott-Clayton

Community College Research Center

Motivation

- For many entering CC students, testing center is one of first places they will visit
- For the majority of students tested, the result is assignment to remediation
- Costs of remediation (tuition & time) are clear, yet benefits are uncertain
- Remedial placement is a high-stakes decision, based on placement exams about which we know relatively little

Goals of the Analysis

- To describe the relationship between placement exam scores and grades in relevant college-level courses
- To better understand the practical tradeoffs involved in raising or lowering cutoffs
- To explore whether the use of additional measures could improve placement outcomes

Overview of Analysis

- Data:
  - 4 cohorts of degree-seeking entrants at Large, Urban Comm. College System (LUCCS)
  - 35,000 to 70,000 observations depending on analysis
- Success criteria:
  - Grades in first college-level course in relevant subject
  - Pass/fail, C or higher, B or higher criteria
- Measures of predictive validity:
  - Correlation coefficients/R-squareds
  - Placement accuracy/error rates
- Other relevant measures:
  - "Solid pass" rates in college-level courses (C or higher criterion)
  - Remediation rate

Tests Weakly Predictive

Proportion of Variation Explained			
	Placement Test Scores Only	High School GPA/Units Only	Placement Test Scores plus HS GPA/Units
Math			
Earned B or higher in CL	0.12	0.10	0.17
Earned C or higher in CL	0.07	0.08	0.11
Passed CL (D- or higher)	0.04	0.06	0.07
Grades in first CL	0.13	0.12	0.18
English			
Earned B or higher in CL	0.02	0.04	0.06
Earned C or higher in CL	0.01	0.04	0.05
Passed CL (D- or higher)	<0.01	0.03	0.04
Grades in first CL	0.02	0.06	0.07

From Scott-Clayton, J. (2012). Do high-stakes placement exams predict college success? CCRC: New York.
(Note: This table rounded to 2 decimal points.)

What is "placement accuracy"?

	Would succeed at college-level	Would not succeed at college-level
Placed into remediation	**Under-placed**	**Accurately placed**
Placed into college-level	**Accurately placed**	**Over-placed**

- We can't directly observe potential outcomes in the top row
- But we can:
  1. Estimate relationship between test scores and outcomes for those placed directly into college level using logistic regression, then
  2. Predict outcomes for those placed into remediation
  3. Use predicted outcomes to simulate overall accuracy and error rates under different placement rules
- Extrapolation is a concern, BUT…
  - Limiting analysis to those near assignment cutoff does not change the story
  - Analysis is certainly relevant given policy trend towards *increasing* cutoffs

Given these tests, are cutoffs in right place?

Table 6. Predicted Severe Error Rates Using Placement Test Scores, Versus Placing All Students in College Level or Remedial

	Using Placement Test Cutoffs
Math	
Severe error rate	0.240
Severe overplacement rate	*0.058*
Severe underplacement rate	*0.183*
Remediation rate	0.748
English	
Severe error rate	0.334
Severe overplacement rate	*0.045*
Severe underplacement rate	*0.289*
Remediation rate	0.805

Given these tests, are cutoffs in right place?

Table 6. Predicted Severe Error Rates Using Placement Test Scores, Versus Placing All Students in College Level or Remedial

	Using Placement Test Cutoffs	All Students In College Level
Math		
Severe error rate	0.240	0.361
Severe overplacement rate	*0.058*	*0.361*
Severe underplacement rate	*0.183*	*0.000*
Remediation rate	0.748	0.000
English		
Severe error rate	0.334	0.294
Severe overplacement rate	*0.045*	*0.294*
Severe underplacement rate	*0.289*	*0.000*
Remediation rate	0.805	0.000

Given these tests, are cutoffs in right place?

Table 6. Predicted Severe Error Rates Using Placement Test Scores, Versus Placing All Students in College Level or Remedial

	Using Placement Test Cutoffs	All Students In College Level
Math		
Severe error rate	0.240	0.361
Severe overplacement rate	*0.058*	*0.361*
Severe underplacement rate	*0.183*	*0.000*
Remediation rate	0.748	0.000
Solid pass rate (C or above) in college-level course	0.670	0.495
Percent of all students solid-passing CL in first term	0.169	0.495
English		
Severe error rate	0.334	0.294
Severe overplacement rate	*0.045*	*0.294*
Severe underplacement rate	*0.289*	*0.000*
Remediation rate	0.805	0.000
Solid pass rate (C or above) in college-level course	0.716	0.605
Percent of all students solid-passing CL in first term	0.140	0.605

Results from Statewide CC System

	Using Placement Test Cutoffs	Placing all students in College Level
Math1:		
Severe error rate:		
ACCUPLACER	21.2	28.4
COMPASS	28	17
Math2:		
Severe error rate:		
ACCUPLACER	17.3	39.9
COMPASS	15.8	40.1
English:		
Severe error rate:		
ACCUPLACER	32.7	18.8
COMPASS	26.8	25.5

Can we do better by incorporating other measures for placement?

Table 8. Predicted Severe Error Rates, Etc
Using Alternative Measures for Placement

	Placement Scores Only	Index of HS GPA/Units Only	Placement Scores PLUS HS Index
Math			
Severe error rate	0.240	0.227	0.213
Severe overplacement rate	*0.058*	*0.048*	*0.045*
Severe underplacement rate	*0.183*	*0.179*	*0.168*
Remediation rate	0.748	0.747	0.747
Solid pass rate (C or above) in college-level course	0.670	0.708	0.734
Percent of all students solid-passing CL in first term	0.169	0.179	0.185
English			
Severe error rate	0.334	0.297	0.295
Severe overplacement rate	*0.045*	*0.022*	*0.027*
Severe underplacement rate	*0.289*	*0.275*	*0.267*
Remediation rate	0.805	0.798	0.798
Solid pass rate (C or above) in college-level course	0.716	0.821	0.815
Percent of all students solid-passing CL in first term	0.140	0.166	0.165

Can we do better by incorporating other measures for placement?

**Table 8. Predicted Severe Error Rates, Etc
Using Alternative Measures for Placement**

	Placement Scores Only	Index of HS GPA/Units Only	Placement Scores PLUS HS Index	Best of Test Scores or HS Index
Math				
Severe error rate	0.240	0.227	0.213	0.217
Severe overplacement rate	*0.058*	*0.048*	*0.045*	*0.074*
Severe underplacement rate	*0.183*	*0.179*	*0.168*	*0.143*
Remediation rate	0.748	0.747	0.747	0.666
Solid pass rate (C or above) in college-level course	0.670	0.708	0.734	0.676
Percent of all students solid-passing CL in first term	0.169	0.179	0.185	0.226
English				
Severe error rate	0.334	0.297	0.295	0.280
Severe overplacement rate	*0.045*	*0.022*	*0.027*	*0.058*
Severe underplacement rate	*0.289*	*0.275*	*0.267*	*0.222*
Remediation rate	0.805	0.798	0.798	0.690
Solid pass rate (C or above) in college-level course	0.716	0.821	0.815	0.758
Percent of all students solid-passing CL in first term	0.140	0.166	0.165	0.235

Results from Statewide CC System

	Placement Test Scores Only	HS GPA Only	Placement Tests + HS GPA
English:			
Severe error rate:			
ACCUPLACER	32.7	16.5	25.7
COMPASS	26.8	12.3	18.8
CL success rate (>=C), assigned to CL:			
ACCUPLACER	76.1	89.0	88.3
COMPASS	72.9	82.9	82.5
Math1:			
Severe error rate:			
ACCUPLACER	21.2	8.2	15.3
COMPASS	28.0	10.9	22.2
CL success rate (>=C), assigned to CL:			
ACCUPLACER	72.2	79.8	78.9
COMPASS	79.4	86.9	88.3
Math2:			
Severe error rate:			
ACCUPLACER	17.3	9.2	14.2
COMPASS	15.8	11.1	14.0
CL success rate (>=C), assigned to CL:			
ACCUPLACER	66.2	74.1	73.4
COMPASS	78.1	86.6	89.6

Other Important Questions

- What are the COSTS associated with different types of placement mistakes?
- Underplacements:
    - Costs of remediation for institutions?
    - Tuition, time costs for students
    - Does remediation improve outcomes or discourage students?
- Overplacements:
    - Faculty morale?
    - Peer effects of more heterogeneous classrooms?

Summary and Implications

- Placement test scores are more predictive in math than English
- Under-placements appear to be much more prevalent than over-placements
- An index of HS GPA/Units does as good or better job at sorting students compared with test scores
- Allowing students to test out of remediation based on "best of" either high school index or test score cutoff is a win-win solution:
  - Would reduce remediation rates by 8 percentage points
  - While increasing college-level success rates
  - Generating large increases in percent succeeding at college-level in first semester
- Findings suggest that multiple measures should be used where possible and schools should retain flexibility to override score-based placements

MORE INFORMATION

Download event materials and learn more at

www.PostsecondaryResearch.org