MLDS Center
Maryland Longitudinal Data System
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High School Predictors of Needing Remedial Coursework In College

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Introduction

- A college-ready student should enter college with the expectation of passing an introductory credit-bearing course.
- Under-prepared students need to take non-credit bearing courses (remedial coursework) prior to enrolling in credit-bearing courses.
- Nationally, about 20% of students entering college report taking remedial courses (Sparks & Malkus, 2013).
- Indicates a mismatch in high school academic preparation and college academic expectations.

Introduction

- Remedial coursework is costly and time-consuming (Knepler et al., 2014).
- 30% of students do not go on to take a credit-bearing course (Jones et al., 2012).
- Students requiring remediation take 4-8 months longer to graduate (Complete College American, 2012).
- Minority students and low SES students are more likely to need remediation (Attewell et al., 2006).

Introduction

- Current practice identifies students needing remedial coursework at the transition from high school into postsecondary
- Examining high school predictors enables earlier identification of students for earlier targeting of practice and policy
- This examination requires linked student data from K-12 into postsecondary

Research Questions

- What are the overall rates of assessment to need remedial coursework in math, English, and reading in Maryland?
- What are the associations between demographic characteristics, high school attendance, and high school assessment scores with likelihood of assessment to need remedial coursework?

Population (High School)

- Data are from the Maryland Longitudinal Data System (MLDS)
- 2012-2013 12th grade cohort
- *N* = 63,896 students in 269 high schools
  - 50% Female
  - 36% Black; 49% White; 15% Other
  - 9% Hispanic
  - 33% FARMs
  - 2.5% ELL
  - 11.5% Special Education

Population (College)

- *N* = 30,452 (48%) enrolled in a Maryland postsecondary institution in the following academic year (2013-2014)
  - 53% Female
  - 32% Black; 50% White; 17% Other
  - 9% Hispanic
  - 27% FARMs
  - 2.3% ELL
  - 7% Special Education

Measure: Remedial Coursework

- Remedial assessments used were from academic year 2013-2014
- Math, English, and Reading assessments administered to first time undergraduates
- Coded 0/1
  - 0 = remediation not assessed or not needed;
  - 1 = either assessed to need remedial coursework or took remedial coursework

Measure: High School Attendance

- Number of five-day school week equivalents a student attended during the 2012-2013 academic year
  - Calculated a ratio of days attended/days enrolled
  - Used ratio to calculate the number of weeks a student would have attended if he/she were enrolled the entire school year (36 weeks)
- *Mean* weeks attended = 33.69 (*SD* = 2.29)
- *Mean* weeks absent = 2.31 (*SD* = 2.29)

Measure: State High School Assessments

- Algebra and English assessments are included
- Created an indicator of the number of times the student failed the HSA
- 80% of students had 0 failed Algebra attempts
  - *Range* = 0-13 failed attempts
- 83% of students had 0 failed English attempts
  - *Range* = 0-10 failed attempts

What are the Rates of Assessment to Need Remedial Coursework?

Subject	Percent
Math	39%
English	19%
Reading	18%
At least 1 subject	42%
2 or more subjects	21%

Analyses

- Multi-level model (2 levels)
  - Level 1 = individual student (N = 30,452)
  - Level 2 = high school (N = 269)
- Binary event as outcome
  - 0 = remediation not assessed or not needed;
  - 1 = either assessed to need remedial coursework or took remedial coursework

Results: Predicting Remedial Coursework in Math (Level 1 Model)

	Est (*SE*)	*OR*
Intercept	0.96 (0.22)	
Gender	0.06 (0.03)	1.06
Black	0.48 (0.04)	1.61
Other Race	-0.16 (0.05)	0.86
Hispanic	0.59 (0.05)	1.81
FARMs	0.25 (0.03)	1.28
ELL	-1.24 (0.10)	0.29
Special Ed	0.58 (0.06)	1.79
Attendance	-0.06 (0.01)	0.95
HSA	1.02 (0.04)	2.77

Results: Predicting Remedial Coursework in English (Level 1 Model)

	Est (*SE*)	*OR*
Intercept	-0.78 (0.25)	
Gender	0.09 (0.03)	1.10
Black	0.45 (0.05)	1.57
Other Race	-0.01 (0.06)	0.99
Hispanic	0.48 (0.06)	1.62
FARMs	0.32 (0.04)	1.38
ELL	-1.02 (0.12)	0.36
Special Ed	0.89 (0.06)	2.42
Attendance	-0.05 (0.01)	0.96
HSA	1.77 (0.04)	5.88

Results: Predicting Remedial Coursework in Reading (Level 1 Model)

	Est (*SE*)	*OR*
Intercept	-2.28 (0.27)	
Gender	0.26 (0.04)	1.29
Black	0.64 (0.05)	1.90
Other Race	0.08 (0.06)	1.08
Hispanic	0.48 (0.07)	1.62
FARMs	0.27 (0.04)	1.32
ELL	-0.97 (0.12)	0.38
Special Ed	0.87 (0.06)	2.38
Attendance	-0.01 (0.01)	0.99
HSA	1.70 (0.04)	5.49

Summary of Results

- 20-30% of variability in needing remedial coursework was accounted for by high school
- Black and Hispanic students were more likely to need remedial coursework
- Students eligible for FARMs were slightly more likely to need remedial coursework
- ELL students were less likely and special education students were more likely to need remedial coursework
- Students who failed the HSA had 2-6x the odds of needing remedial coursework

Limitations

- Model presented here relies on remedial assessment information from the first year of a new data collection
  - Some postsecondary institutions had very low rates of reporting remedial assessments in the new collection
  - Model will be re-run with most recent year of data; results may change slightly, but patterns are expected to be similar
- Remedial assessment information is available only for students who attended Maryland postsecondary institutions
- Continuous measure of remedial assessment scores is not available and would provide for more rigorous analyses

Discussion

- High school factors substantially impact whether a student is assessed to need remedial coursework upon entering college.
- Findings suggest race, ethnicity, and SES disparities in assessed need for remedial coursework.
- Current general education and special education services are not adequately preparing students for entry level college coursework.
- Finding that ELL students were less likely to need remedial coursework was unexpected. It is possible that only the highest achieving ELL students enrolled in college.

Policy Implications and Challenges

- Greater focus on college readiness is needed at the state, district, and high school levels.
- College selectivity and expansion of college access likely play a role.
- More federal, state, and local funding (or re-allocation of current resources) and programmatic supports are needed to prepare high school students for college.
- Identification of early risk factors for being under-prepared enables targeted services in high school. However, under-resourced high schools must be able to implement such assessment and services.

Directions for Future Research

- Examining degree attainment and time to degree for students assessed to need remedial coursework
- Analyses at the high school district and postsecondary institution levels
- Examination of workforce outcomes
- Additional high school predictors of interest

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