Predicting College Success: How Do Different High School Assessments Measure Up?

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*University of California, Davis*

Note: The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305E150006 to the Regents of the University of California. The opinions expressed are those of the authors alone and do not represent views of the Institute or the U.S. Department of Education, or of the agencies providing data.
• Common Core State Standards (2010)
  – Focused on college and career readiness
  – More rigorous
  – Integrated across subject areas

• Smarter Balanced Assessments (2014-15)
  – Summative assessments (end-of-year tests) in ELA and mathematics grades 3-8 and 11
  – 11th grade assessment as a marker for college readiness
Smarter Balanced Assessments

• Summative Assessment
  – Computer Adaptive
  – Performance Task

• Criterion-referenced test, scale score across grade levels

• Performance Level
  ① Standard Not Met
  ② Standard Nearly Met
  ③ Standard Met
  ④ Standard Exceeded
Smarter Balanced Assessments

• Summative Assessment
  – Computer Adaptive
  – Performance Task

• Criterion-referenced test, scale score across grade levels

• Performance Level
  ① Standard Not Met
  ② Standard Nearly Met
  ③ Standard Met
  ④ Standard Exceeded

⇒ 11th grade signal
  “Not Ready”
  “Not Yet Ready”
  “Conditionally Ready”
  “Ready”
Smarter Balanced Assessments and College Outcomes

- Investigating K-12—postsecondary alignment under new state standards
- How does the Smarter Balanced Assessment measure up to other commonly used assessments for predicting college success?
- Equity implications for college eligibility and admissions
Purpose of the Analysis

• How well do the Smarter Balanced Assessment (SBAC), SAT, and high school grade point average (HSGPA) predict first-year college outcomes for students enrolled in the California State University (CSU) or University of California (UC) campuses?

• Do the relationship between these assessments and early college outcomes differ by key student subgroups (race/ethnicity and socioeconomic disadvantage)?
Data

• California 11th grade students who took the Smarter Balanced Assessment (2014-15)
  – Demographics: race/ethnicity, gender, socioeconomic disadvantage, English learners

• Match to first time freshmen in 2016-17 at CSU and UC (respectively)
  – Application Information: SAT scores, HS GPA
  – Outcomes: First Year GPA and 2nd year persistence
• Test predictive validity of common assessments (HSGPA, SAT, SBAC) for early college outcomes: first year GPA, persistence to year two.

• Note: this is a descriptive analysis highlighting the association between each assessment and early college outcomes, and should not be interpreted as causal!
Analysis Plan

- Fit a series of adjusted multiple correlations to examine strength of the relationship between HSGPA, SBAC, and SAT and early college outcomes

- Control for a variety of individual and institutional characteristics

- Adjust for the “restricted range” of grades and test scores based on UC/CSU applicant pool
RESULTS
Results—UC: First Year GPA

Multiple Correlation Coefficients, Adjusted (Raw)

<table>
<thead>
<tr>
<th></th>
<th>All</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(N= 22,891)</td>
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<tr>
<td>HS GPA</td>
<td>.58 (.49)</td>
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<tr>
<td>SAT</td>
<td>.59 (.52)</td>
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<td>HS GPA, SAT, &amp; SBAC</td>
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</table>

Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, race/ethnicity, English Learner status), UC campus differences (excludes Riverside), and high school CCI levels.
## Results—UC: First Year GPA

### Multiple Correlation Coefficients, Adjusted (Raw), by Socioeconomic Disadvantage

<table>
<thead>
<tr>
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Note: Correlation coefficients presented include demographic controls (gender, race/ethnicity, English Learner status), UC campus differences (excludes Riverside), and high school CCI levels.
Results—UC: First Year GPA

Multiple Correlation Coefficients, Adjusted (Raw), by Race/Ethnicity

<table>
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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, English Learner status), UC campus differences (excludes Riverside), and high school CCI levels.
Results—UC: First Year GPA

Proportion of Variation Explained

- HS GPA: 0.34
- SAT: 0.35
- SBAC: 0.31
- HS GPA & SAT: 0.40
- HS GPA & SBAC: 0.37
- HS GPA, SAT, & SBAC: 0.40

(N=22,891)
### Results—UC: Persistence to Second Year

#### Multiple Correlation Coefficients, Adjusted (Raw)

<table>
<thead>
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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, race/ethnicity, English Learner status), UC campus differences (fixed effects), and high school CCI levels.
Results—UC: Persistence to Second Year

Multiple Correlation Coefficients, Adjusted (Raw), by Socioeconomic Disadvantage

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Results—UC: Persistence to Second Year

Multiple Correlation Coefficients, Adjusted (Raw), by Race/Ethnicity

<table>
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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, English Learner status), UC campus differences (fixed effects), and high school CCI levels.
RESULTS
### Results—CSU: First Year GPA

#### Multiple Correlation Coefficients, Adjusted (Raw)

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<tr>
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<td>HS GPA</td>
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<td>SAT</td>
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### Multiple Correlation Coefficients, Adjusted (Raw), by Socioeconomic Disadvantage

<table>
<thead>
<tr>
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<th>NOT SED (N= 17,402)</th>
<th>SED (N=19,117)</th>
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## Results—CSU: First Year GPA

### Multiple Correlation Coefficients, Adjusted (Raw), by Race/Ethnicity

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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, English Learner status), CSU campus differences (fixed effects), and high school CCI levels.
Results—CSU: First Year GPA

Proportion of Variation Explained

- HS GPA: 0.24
- SAT: 0.18
- SBAC: 0.18
- HS GPA & SAT: 0.26
- HS GPA & SBAC: 0.26
- HS GPA, SAT, & SBAC: 0.26

(N=36,519)
### Multiple Correlation Coefficients, Adjusted (Raw)

<table>
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<th></th>
<th>All (N= 43,791)</th>
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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, race/ethnicity, English Learner status), CSU campus differences (fixed effects), and high school CCI levels.
## Results—CSU: Persistence to Second Year

### Multiple Correlation Coefficients, Adjusted (Raw), by Socioeconomic Disadvantage

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## Results—CSU: Persistence to Second Year

### Multiple Correlation Coefficients, Adjusted (Raw), by Race/Ethnicity

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Note: Correlation coefficients presented include demographic controls (gender, socioeconomic disadvantage, English Learner status), CSU campus differences (fixed effects), and high school CCI levels.
Equity Implications for Admissions

• Assessing distributional characteristics of the top of the UC applicant pool using different assessments
  – Race/ethnicity
  – socioeconomic disadvantage
Predicted Top 10% of UC Applicant Pool (Socioeconomic Disadvantage)

All estimates account for campus differences and are constructed using first year GPA.
Predicted Top 10% of UC Applicant Pool (Race/Ethnicity)

All estimates account for campus differences and are constructed using first year GPA.
Summary

- Smarter Balanced Assessment scores are no worse (or better) than SAT scores at predicting first-year college GPA and persistence rates at CSU/UC.

- At UC, SAT is only a marginally better predictor of first-year GPA than SBAC, but the difference in magnitude is trivial (~2 %points).
• Why the similarities:
  – Overlap in the knowledge and skills assessed by the SBAC and the SAT
  – SBAC designed to reflect the state’s effort to align K-12 standards to expectations for postsecondary success

• Caveats:
  – SBAC perceived to have lower stakes than the SAT
  – Students do not retake the SBAC (unlike the SAT)
  – No preparatory courses for SBAC (unlike the SAT)
Next Steps

• Add additional cohort
  – Second year of SBAC 11th graders
  – First year of new SAT

• Additional Outcomes
  – College readiness (developmental courses)
  – Course performance
  – Others?
California Education Lab
University of California, Davis

A research collaborative at UC Davis partnering with Policy Analysis for California Education (PACE) and Wheelhouse: The Center for Community College Leadership and Research

Michal Kurlaender, Professor of Education
Scott Carrell, Professor of Economics
Paco Martorell, Professor of Education
Policy Context

- Growing college wage premium
- Shortfall of college graduates
- Persistent gaps in college readiness, entry, persistence, and completion by race/ethnicity and socioeconomic disadvantage
- Weak intersegmental coordination
- Changing policies around remediation
• DATA PARTNERSHIPS
  - California Department of Education
  - California State University Chancellor’s Office
  - California Community Colleges Chancellor’s Office
  - University of California Office of the President
  - California Student Aid Commission
  - College Board

• PROJECTS
  - College and Career Readiness Standards and Assessments
  - Intersegmental Partnerships and Alignment
  - Exploring Student Success in College
  - Financial Aid Policies & Practices in Community Colleges
California Education Lab

• **FUNDERS**
  - Institute of Education Sciences, US Department of Education
  - College Futures Foundation
  - Bill & Melinda Gates Foundation
  - Ford Foundation
  - Irvine Foundation
  - Stupski Family Foundation
Where California High School Students Attend College

Michal Kurlaender, Sherrie Reed, Kramer Cohen, Matt Naven, Paco Martorell & Scott Carrell
63% of California Public High School Students Enroll in College after Graduation

37% 2-Year College
26% 4-Year College
37% No College
Institution of Enrollment among California Public High School Students who Enroll in College

- 57% California Community College
- 18% California State University
- 11% Out-of-State
- 10% University of California
- 4% Private In-State (2- and 4-Year)
College Enrollment Rates Vary by County
College Enrollment Rates Vary by Race/Ethnicity

- **All**
  - 36% CCC
  - 11% CSU
  - 6% UC
  - 3% Private In-State (2- and 4-Year)
  - 7% Out-of-State

- **Asian/PI**
  - 32% CCC
  - 17% CSU
  - 18% UC
  - 4% Private In-State (2- and 4-Year)
  - 7% Out-of-State

- **Black/Af Am**
  - 36% CCC
  - 9% CSU
  - 3% UC
  - 2% Private In-State (2- and 4-Year)
  - 8% Out-of-State

- **Latino/a**
  - 38% CCC
  - 10% CSU
  - 4% UC
  - 2% Private In-State (2- and 4-Year)
  - 3% Out-of-State

- **White**
  - 35% CCC
  - 11% CSU
  - 6% UC
  - 4% Private In-State (2- and 4-Year)
  - 13% Out-of-State
College Enrollment Rates Vary by Socioeconomic Disadvantage

- **All**
  - CCC: 36%
  - CSU: 11%
  - UC: 6%
  - Private In-State (2- and 4-Year): 3%
  - Out-of-State: 7%

- **Non-SED**
  - CCC: 35%
  - CSU: 13%
  - UC: 8%
  - Private In-State (2- and 4-Year): 4%
  - Out-of-State: 12%

- **SED**
  - CCC: 37%
  - CSU: 10%
  - UC: 4%
  - Private In-State (2- and 4-Year): 2%
  - Out-of-State: 3%
College and Career Readiness
California’s K-12 Schools

Michal Kurlaender, Sherrie Reed,
Kramer A. Cohen & Briana Ballis
Disparities in College Readiness among California High School Students

11th Grade Smarter Balanced Assessment Achievement Levels by Race/Ethnicity
Disparities in College Readiness among California High School Students

11th Grade Smarter Balanced Assessment Achievement Levels by Socioeconomically Disadvantaged and English Learner Status
College Readiness among California High School Students

Application and Enrollment for CSU and CCC
College Readiness among California High School Students

College Readiness for CSU and CCC

![Bar chart showing college readiness for CSU and CCC]
Evaluating College Preparation: 12th Grade Course Taking

Michal Kurlaender, Minahil Asim, & Alexandria Hurtt
Rigorous courses are associated with a number of postsecondary outcomes:

- College entry
- Type of college entry
- College performance and completion

Why? Mechanisms: improved skills, quality instruction/materials, college signaling, peer effects

Course selection is based on an interaction of student choice and structural constraints/barriers at the school.
Differences in 12th grade Math Course Taking by SBAC Level

- **Standard Exceeded**
  - Advanced Math: 72.05%
  - Conditionally Ready above Algebra II: 87.11%
  - Conditionally Ready: 87.44%
  - All Math: 91.93%

- **Standard Met**
  - Advanced Math: 39.37%
  - Conditionally Ready above Algebra II: 69.51%
  - Conditionally Ready: 73.05%
  - All Math: 83.50%

- **Standard Nearly Met**
  - Advanced Math: 13.33%
  - Conditionally Ready above Algebra II: 47.52%
  - Conditionally Ready: 60.11%
  - All Math: 75.05%

- **Standard Not Met**
  - Advanced Math: 2.78%
  - Conditionally Ready above Algebra II: 24.19%
  - Conditionally Ready: 42.73%
  - All Math: 67.55%

Legend:
- Advanced Math
- Conditionally Ready above Algebra II
- Conditionally Ready
- All Math
Differences in 12th grade Math Course Taking by Race/Ethnicity

- **White**
  - Advanced Math: 24.51%
  - Conditionally Ready above Algebra II: 47.99%
  - Conditionally Ready: 56.04%
  - All Math: 71.55%

- **Hispanic/Latino**
  - Advanced Math: 14.77%
  - Conditionally Ready above Algebra II: 41.60%
  - Conditionally Ready: 56.01%
  - All Math: 75.26%

- **African American**
  - Advanced Math: 12.14%
  - Conditionally Ready above Algebra II: 38.44%
  - Conditionally Ready: 54.02%
  - All Math: 74.01%

- **Asian/Filipino/Pac Islander**
  - Advanced Math: 44.34%
  - Conditionally Ready above Algebra II: 68.33%
  - Conditionally Ready: 74.25%
  - All Math: 84.67%
Differences in 12th grade Math Course Taking by Socioeconomic Disadvantage

<table>
<thead>
<tr>
<th></th>
<th>Advanced Math</th>
<th>Conditionally Ready above Algebra II</th>
<th>Conditionally Ready</th>
<th>All Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not SED</td>
<td>28.81%</td>
<td>53.55%</td>
<td>61.84%</td>
<td>76.19%</td>
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<tr>
<td>SED</td>
<td>15.82%</td>
<td>41.84%</td>
<td>55.83%</td>
<td>74.94%</td>
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</table>
### Differences in 12th grade ELA Course Taking by Race/ethnicity

<table>
<thead>
<tr>
<th></th>
<th>All students</th>
<th>Asian/PI</th>
<th>Black/Af Am</th>
<th>Hispanic</th>
<th>White</th>
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<tbody>
<tr>
<td> </td>
<td></td>
<td>49.6%</td>
<td>63.6%</td>
<td>41.6%</td>
<td>34.3%</td>
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<tr>
<td>AP</td>
<td>40.3%</td>
<td>5.4%</td>
<td>41.6%</td>
<td>41.0%</td>
<td>56.6%</td>
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<tr>
<td>IB</td>
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<td>25.4%</td>
<td>41.6%</td>
<td>41.0%</td>
<td>34.3%</td>
</tr>
<tr>
<td>ERWC</td>
<td></td>
<td>5.6%</td>
<td>3.3%</td>
<td>3.3%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Honors</td>
<td></td>
<td>5.8%</td>
<td>5.4%</td>
<td>3.3%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>
Differences in 12th grade ELA Course Taking by Socioeconomic Disadvantage

- All students:
  - AP: 49.6%
  - IB: 40.3%
  - ERWC: 4.3%
  - Honors: 5.8%

- SED:
  - AP: 42.4%
  - IB: 47.1%
  - ERWC: 3.3%
  - Honors: 7.2%

- Not SED:
  - AP: 57.0%
  - IB: 33.5%
  - ERWC: 5.2%
  - Honors: 4.3%
Next Steps

• Assessing the college readiness signals

• Distribution of college rigorous coursework across California high schools

• Connecting high school course taking to a broader set of college outcomes

• Examining changing policies to college admissions
THANK YOU!

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