THE AP PIPELINE

Improving Access to Rigorous High School Coursework

SDP Convening | April 24, 2014

Center for Education Policy Research
HARVARD UNIVERSITY

PANELISTS

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April 24, 2014

Using Data to Increase AP Participation

Maureen Reyes

2014 Strategic Data Project - Beyond the Numbers

AP

CollegeBoard

The College Board's Mission

The College Board's mission is to connect students to college success and opportunity. We are a not-for-profit membership organization committed to excellence and equity in education.

Goals for Today

- Share information about the College Board's AP Potential Tool
- Provide examples of how the College Board uses data to increase AP participation
- Highlight current campaigns

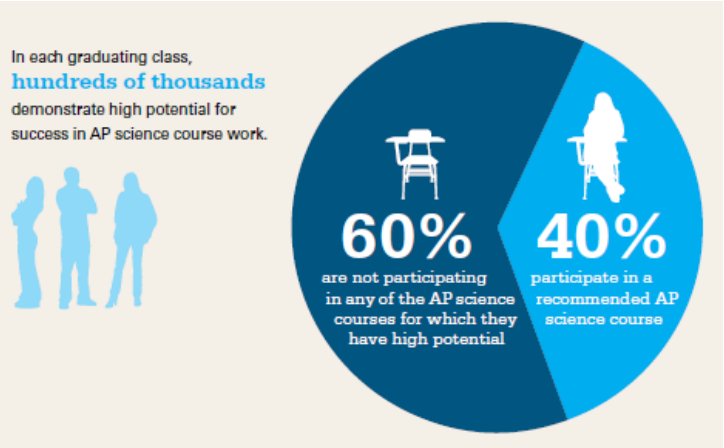
The AP® Program

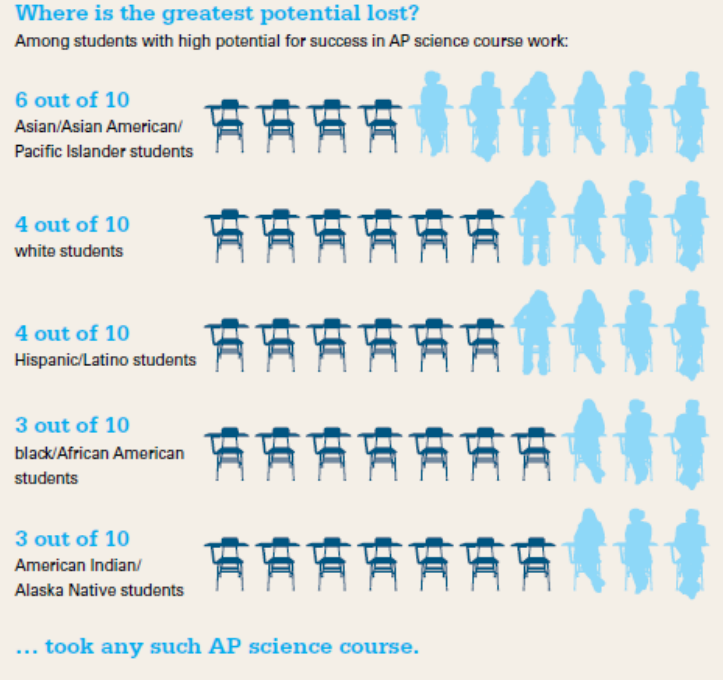
In 2013

- 2,000,000 students
- 19,000 high schools around the world
- 4,000,000 exams
- 4,000 colleges and universities

Unfulfilled potential

- In the class of 2013, hundreds of thousands of students identified as having a high likelihood of success in AP did not take any recommended AP Exam.
- Significant inequities in AP participation are seen along racial and ethnic lines





What are we doing to identify students that are ready for AP and encourage them to enroll?

AP Potential

- AP Potential is a free, Web-based tool that helps you increase access to AP by using PSAT/NMSQT® score data to identify students with the potential to succeed in AP.

- Research shows that PSAT/NMSQT scores predict performance on specific AP Exams—often with more accuracy—than other traditionally used methods.

appotential.collegeboard.org

Report to School and District Users

SAMPLE SCHOOL ROSTER

AP Subject

% probability of success on an AP Exam (a score of 3 or higher)

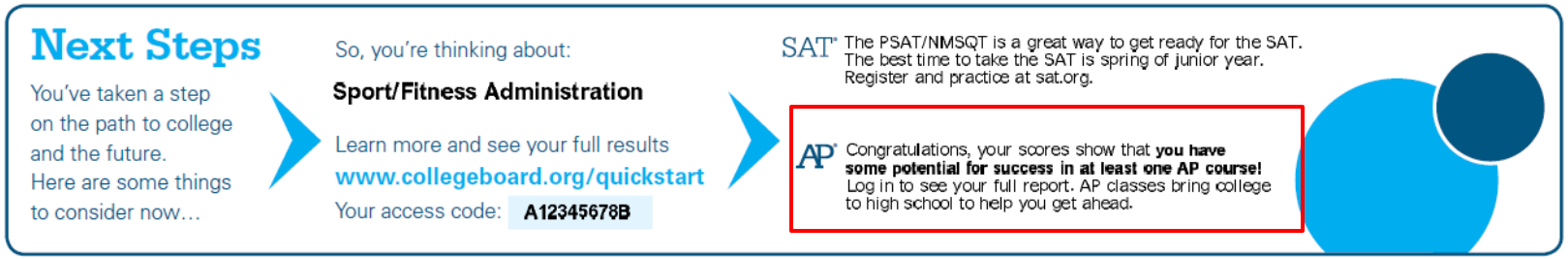
Name of student

A "Y" indicates a student has potential for success for the subject in which it appears

Grade	Subject »	Art History	Biology	Calculus AB	Calculus BC	Chemistry	Comp. Govt. & Pol.	Comp Sci A	English Lang.	English Lit.	Environmental Sci.	European Hist.	Human Geography	Macroeconomics	Microeconomics	Music Theory	Physics B	Physics C: E & M	Physics C: Mech.	Psychology	Statistics	U.S. Govt. & Pol.	U.S. History	World History
	Pool »	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
10th Grade																								
A R N, A									Y			Y								Y				Y
AARIAN, A					Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
AARON, A									Y			Y	Y							Y				Y
AARON, A				Y	Y						Y	Y	Y							Y				Y
AARON, A A																				Y				
AARON, A				Y	Y				Y		Y	Y	Y		Y	Y				Y	Y		Y	Y
AARON, A		Y							Y	Y		Y	Y							Y			Y	Y
AARON, A			Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
ABDULLAH, A									Y															
ABHIK, A D				Y	Y															Y				Y
ABUL, A H																				Y				
ADAM, A S		Y					Y		Y	Y	Y	Y	Y		Y	Y				Y	Y	Y	Y	Y
ADAN, A U			Y	Y	Y	Y		Y	Y		Y	Y	Y	Y	Y		Y		Y	Y	Y		Y	Y
ADANFA, A				Y	Y											Y				Y				Y

AP Potential feedback added to PSAT/NMSQT score reports

- ***New!*** **Starting this year, AP feedback was featured on the Score Report *Plus***
- Feedback is based on PSAT/NMSQT section scores
- Level of potential for each subject can be viewed in My College QuickStart



My College Quickstart & AP Potential

My AP Potential

You can use this report to see your potential for AP courses based on your PSAT/NMSQT scores. AP cou more...

1. **Review the full list of courses**
   You may have potential for AP courses that aren't currently on your radar.
2. **Take a closer look**
   Sort your list to see courses related to the college majors that interest you. Learn more about each course and how it can help you succeed in college.
3. **Talk to your school counselor and teachers**
   They can help you decide the best course for you!

Communication

AP Courses	Potential	Matches Major	Your School Offered This Course
Psychology		✓	✓
Art History			✓
Calculus BC			✓
English Language		✓	✓
European History			✓

Interpret your report

Potential

Your scores show that you have the potential for success in this course. Speak with your school counselor to see if you have the appropriate prerequisite courses and find out how you can enroll. less...

Some Potential

Your scores show that you have some potential for success in this AP course. Having interest in the course subject as well as your dedication to working hard will only increase your chances for success. Speak with your school counselor to see if you have the appropriate prerequisite courses and find out how you can enroll. less...

Potential Not Yet Indicated

Your scores show that you may need more preparation and support to

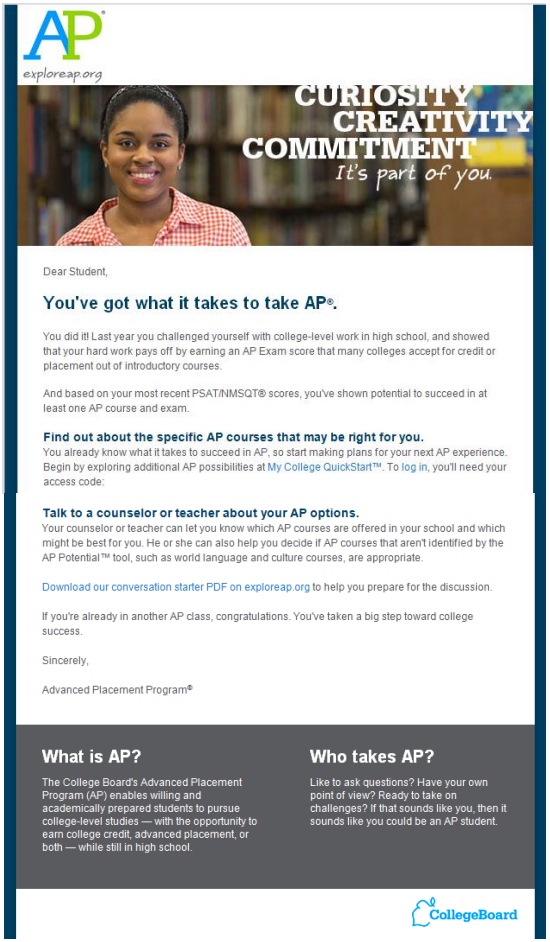
The shading of the steps icons illustrates your potential

Choosing a major puts a checkmark in the Matches Major column next to appropriate courses

This column tells you if this course is likely offered at your school

Look for courses where you have "potential", it matches your major, and it's offered at your school

Student Emails



AP
exploreap.org

CURIOSITY
CREATIVITY
COMMITMENT
It's part of you.

Dear Student,

You've got what it takes to take AP®.

You did it! Last year you challenged yourself with college-level work in high school, and showed that your hard work pays off by earning an AP Exam score that many colleges accept for credit or placement out of introductory courses.

And based on your most recent PSAT/NMSQT® scores, you've shown potential to succeed in at least one AP course and exam.

Find out about the specific AP courses that may be right for you.
You already know what it takes to succeed in AP, so start making plans for your next AP experience. Begin by exploring additional AP possibilities at My College QuickStart™. To log in, you'll need your access code:

Talk to a counselor or teacher about your AP options.
Your counselor or teacher can let you know which AP courses are offered in your school and which might be best for you. He or she can also help you decide if AP courses that aren't identified by the AP Potential™ tool, such as world language and culture courses, are appropriate.

Download our conversation starter PDF on exploreap.org to help you prepare for the discussion.

If you're already in another AP class, congratulations. You've taken a big step toward college success.

Sincerely,

Advanced Placement Program®

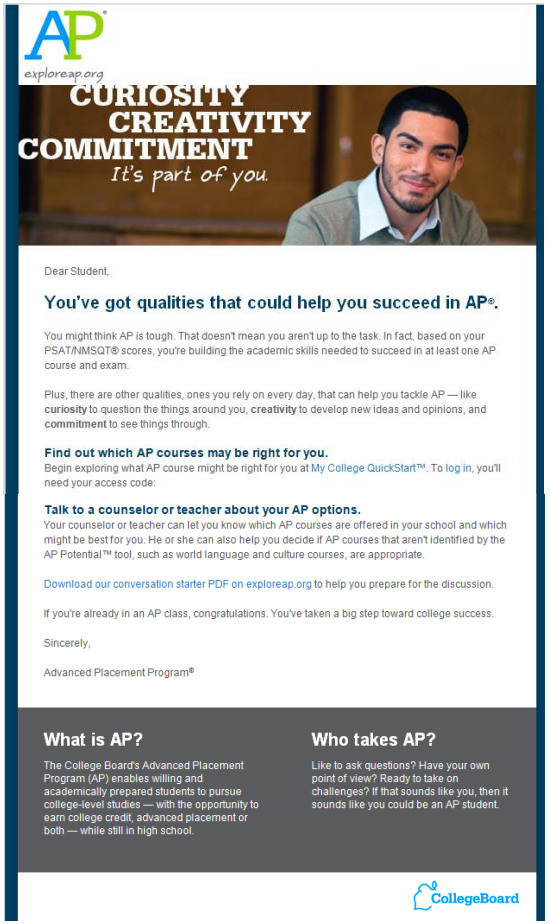
What is AP?

The College Board's Advanced Placement Program (AP) enables willing and academically prepared students to pursue college-level studies — with the opportunity to earn college credit, advanced placement, or both — while still in high school.

Who takes AP?

Like to ask questions? Have your own point of view? Ready to take on challenges? If that sounds like you, then it sounds like you could be an AP student.

CollegeBoard



AP
exploreap.org

CURIOSITY
CREATIVITY
COMMITMENT
It's part of you.

Dear Student,

You've got qualities that could help you succeed in AP®.

You might think AP is tough. That doesn't mean you aren't up to the task. In fact, based on your PSAT/NMSQT® scores, you're building the academic skills needed to succeed in at least one AP course and exam.

Plus, there are other qualities, ones you rely on every day, that can help you tackle AP — like **curiosity** to question the things around you, **creativity** to develop new ideas and opinions, and **commitment** to see things through.

Find out which AP courses may be right for you.
Begin exploring what AP course might be right for you at My College QuickStart™. To log in, you'll need your access code:

Talk to a counselor or teacher about your AP options.
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CollegeBoard

Equity Gaps Among Traditionally Underserved Students in the Class of 2013: Black/African American

		PARTICIPATION			SUCCESS		
	% of Graduating Class	% of AP Exam Takers	Equity Gap Eliminated	Progress Since Last Year	% of AP Exam Takers Scoring 3+ During High School	Equity Gap Eliminated	Progress Since Last Year
District of Columbia	81.8	67.0		▲	33.7		▼
Mississippi	49.7	31.2		▲	13.6		▲
Louisiana	40.0	27.9		▲	12.2		▲
Maryland	35.7	22.0		▲	11.7		▲
Georgia	35.6	25.9		▼	13.3		—
South Carolina	34.7	15.7		▲	9.3		▲
Alabama	31.9	24.3		▲	11.0		▲
Delaware	31.1	16.8		▲	10.2		▲
North Carolina	26.2	13.1		▲	7.7		▲
Tennessee	22.7	17.1		▼	8.1		▲
Virginia	22.6	13.6		▲	7.7		▲
Florida	20.6	14.6		▼	7.3		▼
Arkansas	20.3	14.1		▼	4.9		▲
Michigan	17.6	5.9		▲	2.7		▲
New York	16.6	9.3		▲	5.1		▲
Illinois	16.4	11.1		▼	4.6		▲
Missouri	15.5	10.3		▼	3.8		▲
New Jersey	15.3	6.3		▲	3.6		▲
UNITED STATES	**14.5**	**9.2**		▲	**4.6**		▲
Pennsylvania	13.3	7.9		▲	2.9		▲
Ohio	12.9	7.2		▲	3.7		▲
Texas	12.2	9.0		▲	4.8		▲
Connecticut	12.0	6.0		▼	3.2		▲
Kentucky	10.4	6.0		▼	3.4		▼
Indiana	10.2	6.5		▲	3.0		—
Oklahoma	10.1	7.4		▲	4.0		▲
Nevada	8.5	5.4		▲	3.1		▲
Massachusetts	8.3	5.7		▲	3.2		▲

80%
40%
30%
20%
10%

- Identifying and closing the equity gap

Support for schools

Partnerships to expand AP opportunities for students

- **Google provided funding to start 530 new AP math and science courses in fall 2013 for schools with 10+ underrepresented minority and female students with AP Potential**

- **Dell is providing funding to start 150 new AP courses in fall 2014 for low-income schools with 10+ students with AP Potential**

GLOBAL IMPACT AWARDS
Google

DonorsChoose.org
Teachers ask. You choose.

Michael & Susan Dell
FOUNDATION

CollegeBoard

All In

A multi-year, multi-faceted, coordinated campaign to change public understanding, institutional practices, student behaviors, and public policy so that more students with AP Potential are taking advantage of the opportunities they've earned.

All In outreach to date

- Snail Mail Campaign
  - Sent **30,000** letters and received almost **1000** responses from parents interested in enrolling their children and expanding opportunities for other African American, Latino, and Native American students
- Email Campaign
  - Mobilized star power (Richard Sherman and Shonda Rhimes)
  - Emailed over **20,000** students with AP Potential
  - Emailed over **40,000** education professionals including teachers, principals, superintendents, AP coordinators, and counselors
- Social Media Campaign
  - **7,000** new visits to the AP Student site
  - Almost **1000** new followers of the AP for Students Twitter handle

AP Potential Success Stories

Providence, RI

AP participation has increased in Providence, RI, high schools after the district began using AP Potential data more systematically.

The number of AP Exam takers in Providence **increased more than 400%**, from 200 in 2008-09 to 937 in 2012-13

Hillsborough, FL

Hillsborough began providing the PSAT to all 9th, 10th, and 11th graders for free and using AP Potential to identify and recruit students for AP.

Hillsborough achieved a **60% increase in the total number of students taking AP Exams** and a 54% increase in the number of students scoring a 3 or higher.

Thank You!

Contact Information

Maureen Reyes

Senior Director, AP Program Management

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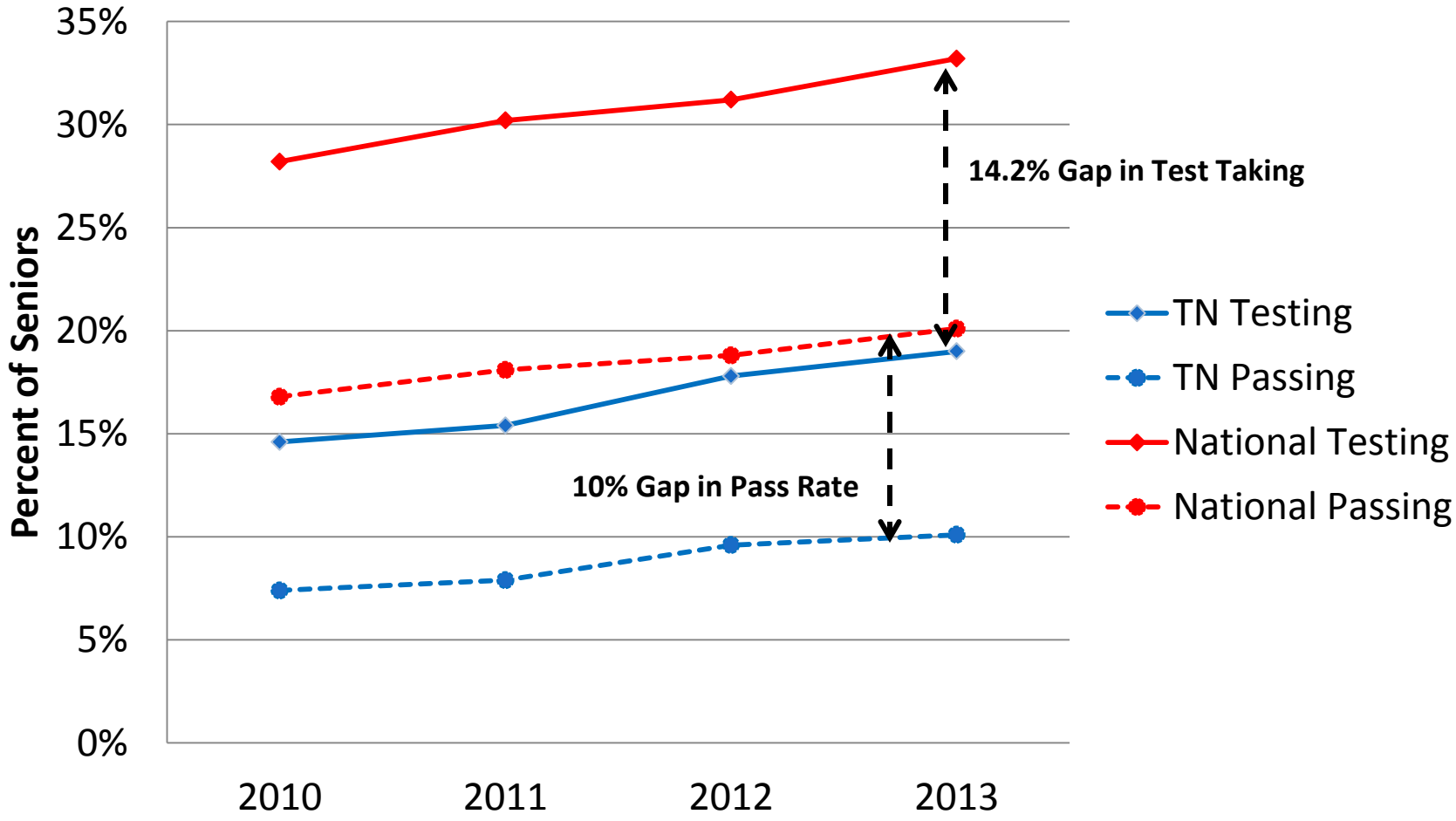
Advanced Placement Strategy

A Framework for Identifying School-level Barriers to AP Success

Tennessee Department of Education

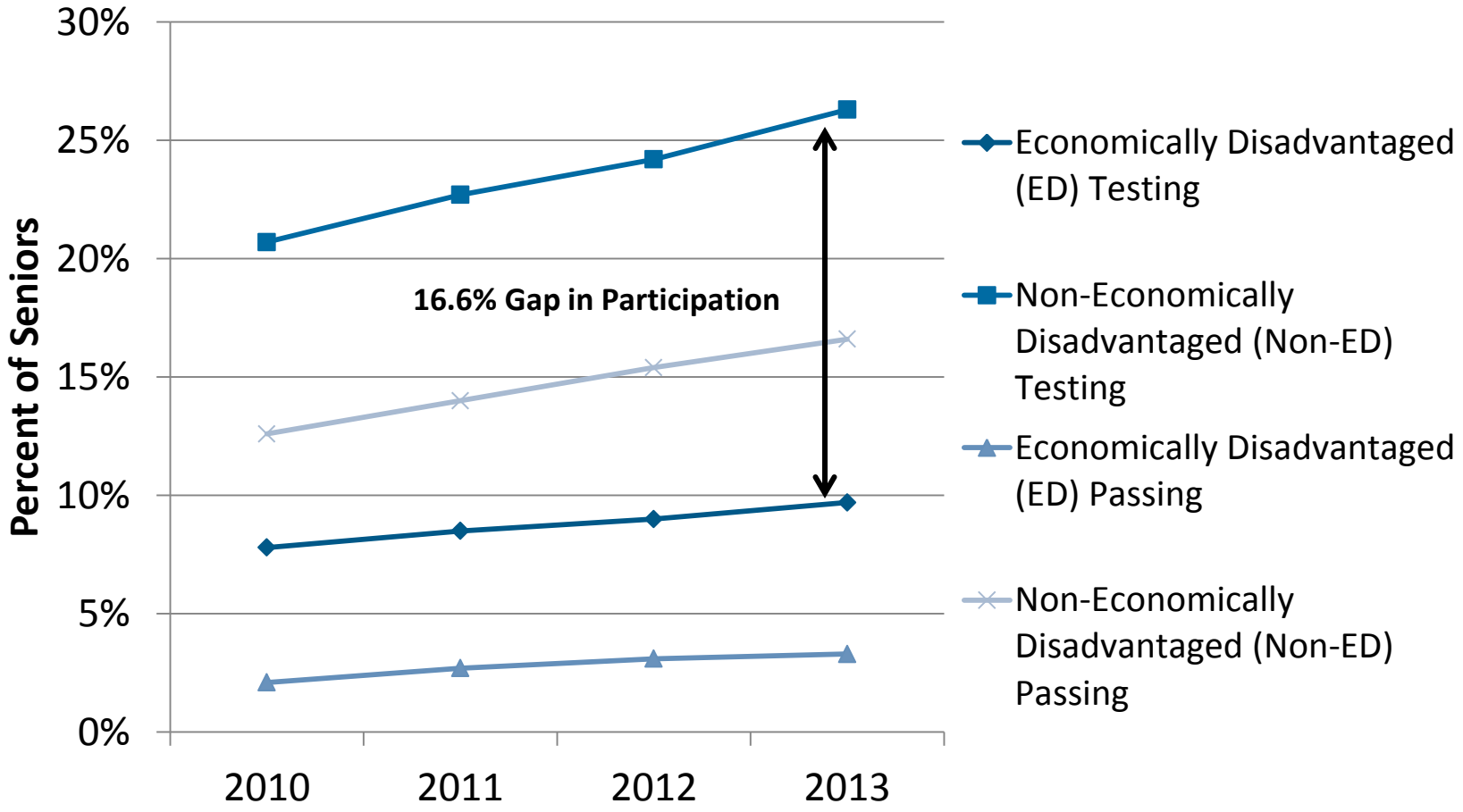
Office of Research and Policy

The percentage of Tennessee students taking and passing AP exams has increased, but continues to lag behind the national average



Note: Graph shows the percentage of seniors in recent graduating cohorts taking and passing at least one AP exam throughout their high school career

Within Tennessee, we see large disparities between economically disadvantaged students and other students, with the gap again increasing over time



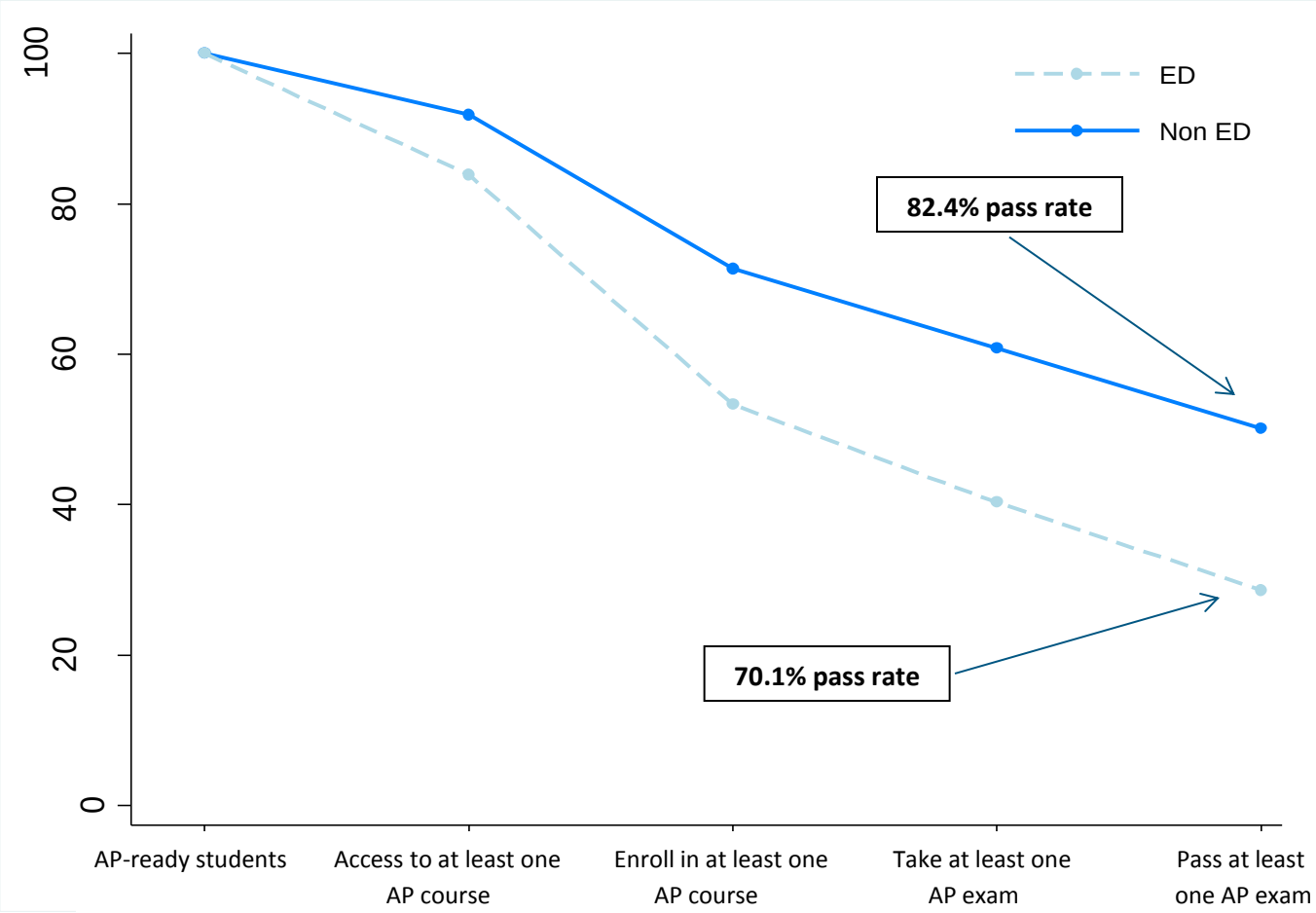
Note: Graph shows the percentage of seniors in recent graduating cohorts taking and passing at least one AP exam throughout their high school career

Our Approach

- Identify AP-ready students based on 8th grade test scores
- Chart AP pipeline at the school level to diagnose problem areas
- Identify school-specific interventions based on pipeline data

To raise AP success, we need to more successfully steer students along the AP pipeline

At the state level, we see drop-offs at every point in the AP pipeline and large gaps between ED and non-ED students



But the state-level picture hides a host of school-specific issues that require different intervention strategies

- Among 347 high schools, 180 schools include at least 9 AP-ready students

- We classify these 180 high schools into the following types:
  - **Low access**: AP-ready students have little to no access to AP classes
  - **Low Enrollment**: AP-ready students do not enroll in AP classes
  - **Differential enrollment**: AP-ready enrollment rates differ by ED status
  - **Low test-taking**: AP-ready students take classes but not AP tests
  - **Differential test-taking**: AP-ready test-taking rates differ by ED status

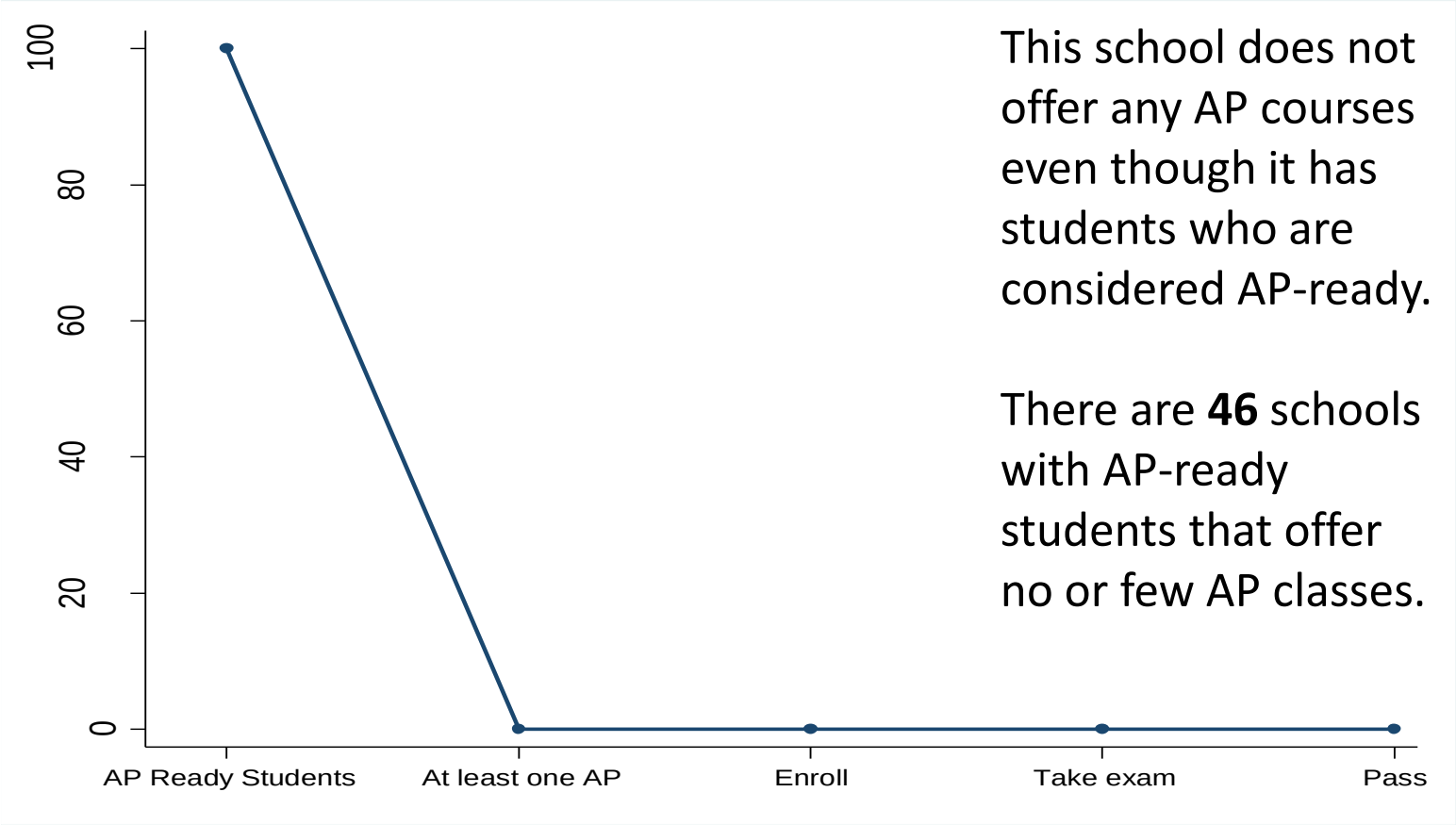
<u>Not every school needs to fall into one of these categories, and some high schools can fall into multiple categories</u>

AP Pipeline Graphs

- Each of the following graphs shows the AP pipeline for an actual Tennessee high school
- The graphs were selected to provide examples of five major pipeline issues that can be found in schools across the state

Low Access

Little to no opportunities for students to enroll in AP coursework



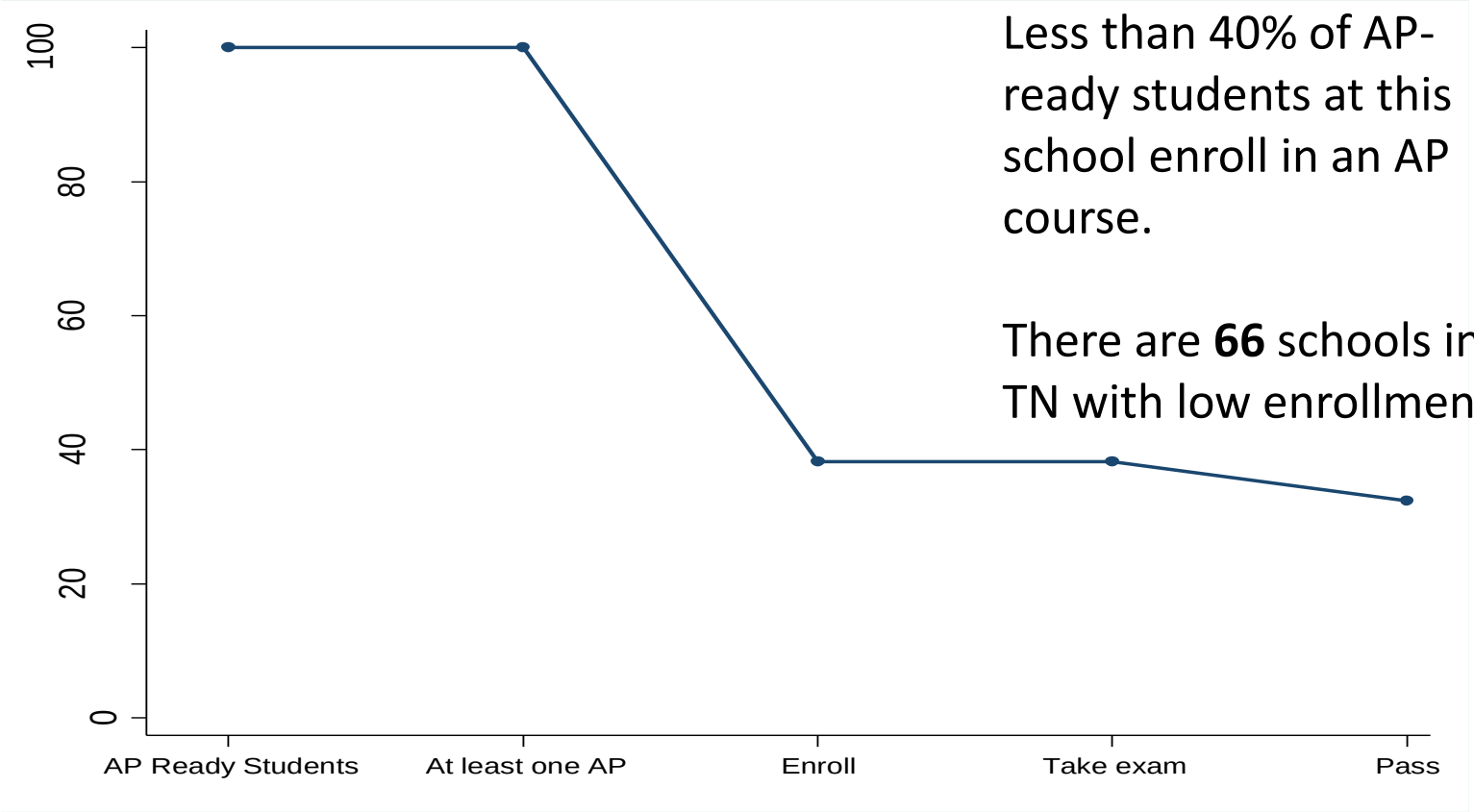
This school does not offer any AP courses even though it has students who are considered AP-ready.

There are **46** schools with AP-ready students that offer no or few AP classes.

Preparation | **Enrollment** | Testing | Passing | Success

Low Enrollment

AP-ready students enroll in AP courses at low rates



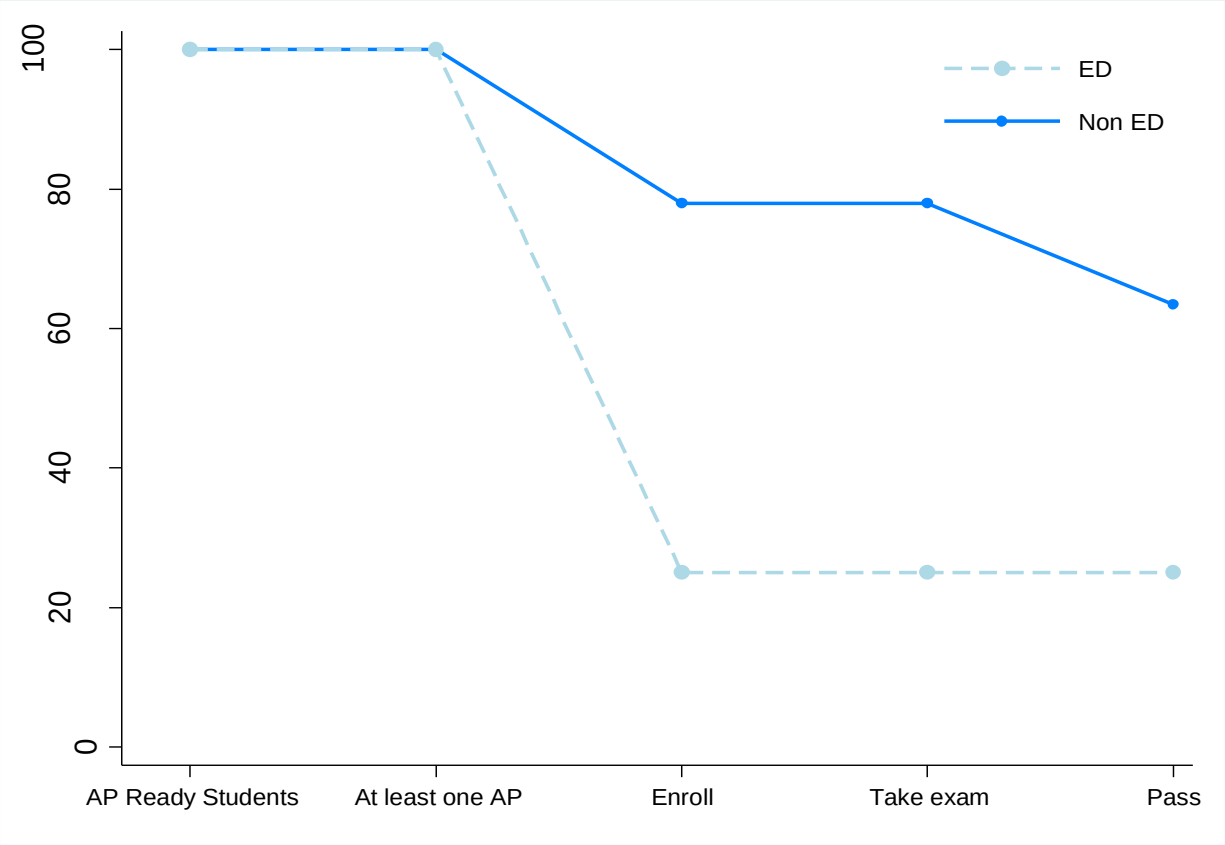
Less than 40% of AP-ready students at this school enroll in an AP course.

There are **66** schools in TN with low enrollment.

Preparation | **Enrollment** | Testing | Passing | Success

Differential Enrollment

AP-ready students enroll in AP courses at different rates, depending on ED status



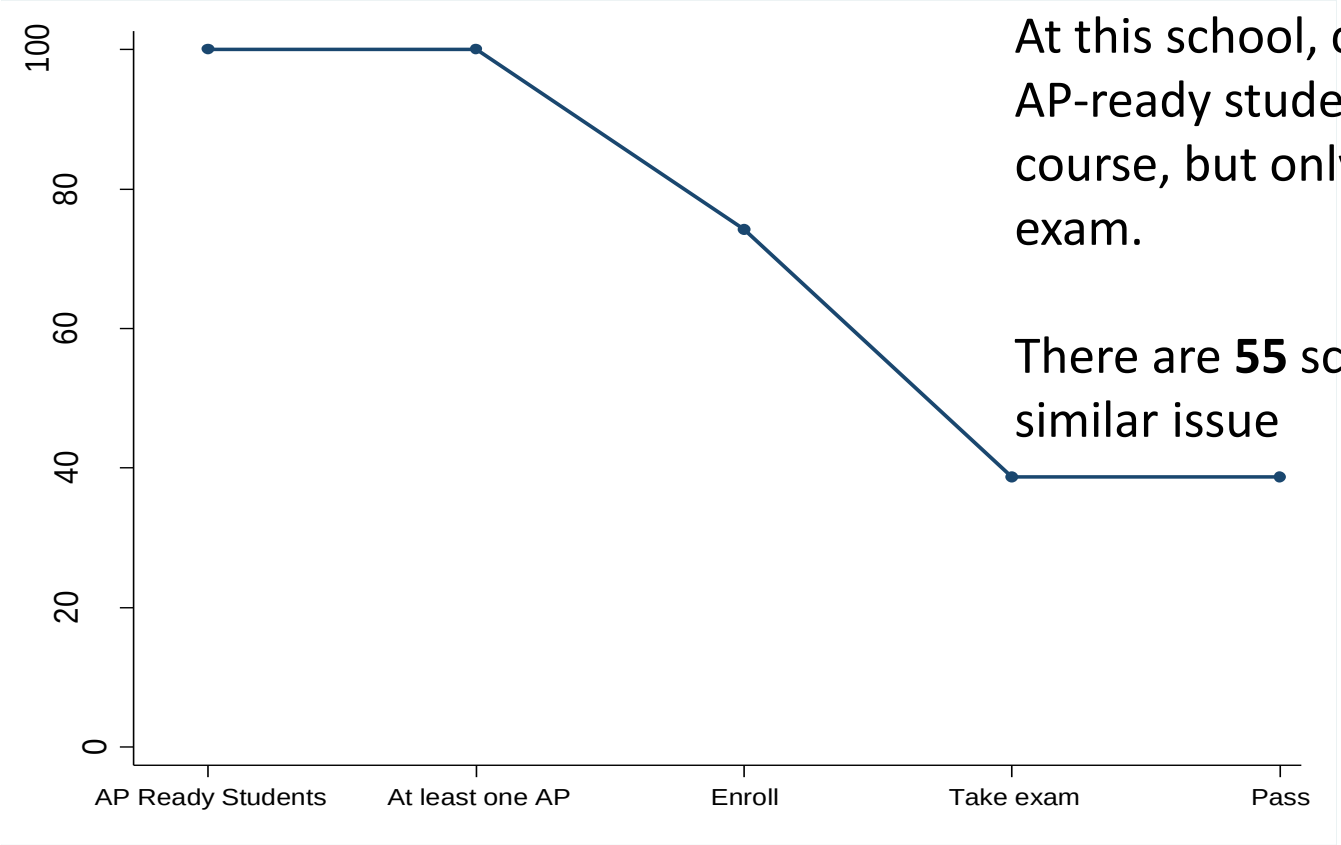
Less than 30% of AP-ready ED students at this school enroll in AP courses.

There are **66** schools in TN with a similar issue.

Preparation | **Enrollment** | **Testing** | **Passing** | **Success**

Low Test-Taking

AP-ready students enroll in AP courses but do not take exams



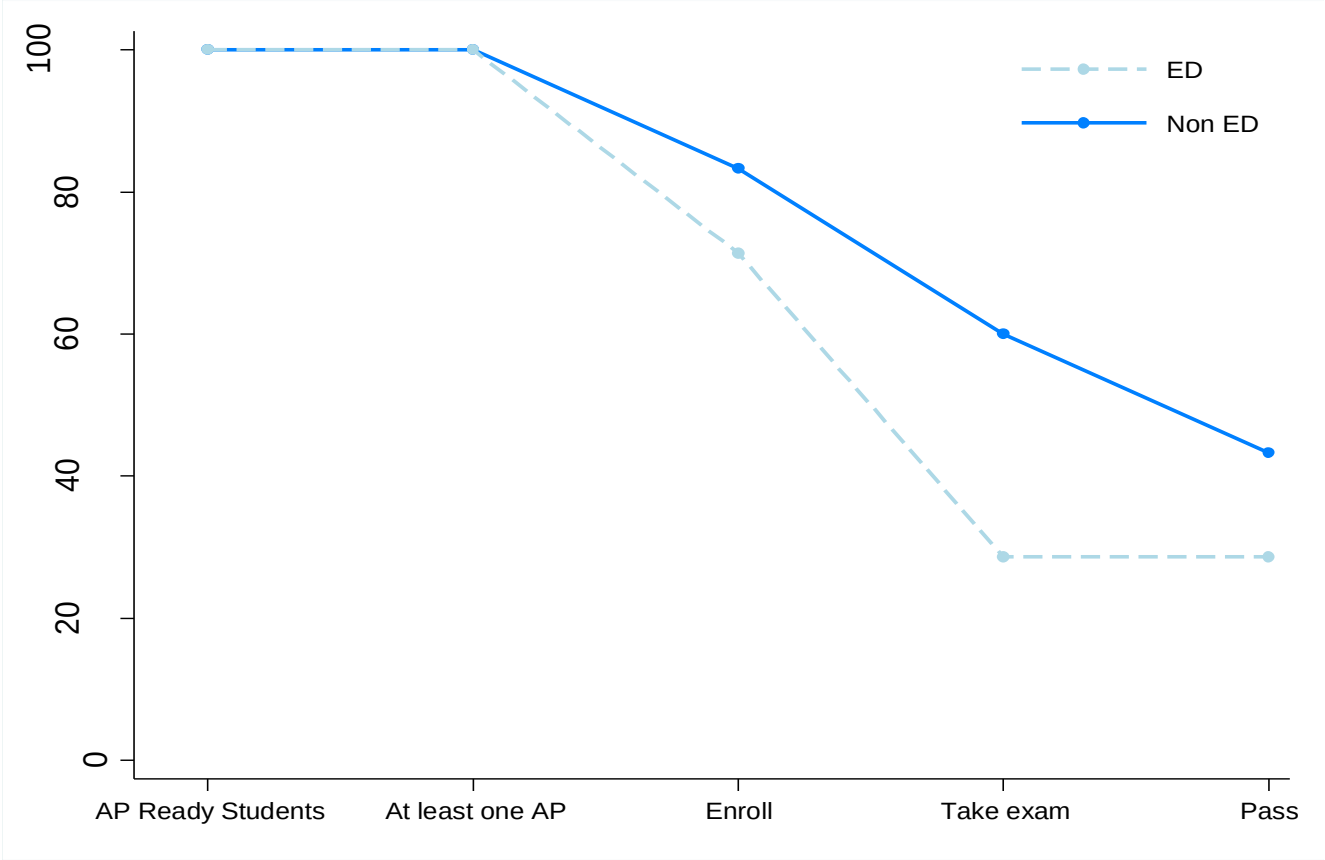
At this school, close to 80% of AP-ready students enrolled in a course, but only 40% took the exam.

There are **55** schools in TN with a similar issue

Preparation | Enrollment | **Testing** | Passing | Success

Differential Test-Taking

AP-ready ED and non-ED students test at different rates



Of the AP-ready students at this school, about 30% of ED students took the AP exam, while over 60% of their non-ED peers tested.

There are **30** schools in TN with a similar issue.

Preparation | **Enrollment** | **Testing** | **Passing** | **Success**

This research informed two AP pilots

- **2013-15 AP Exam Fee Pilot**
  - Legislation passed in 2013 establishing a two-year pilot program to pay for AP exam fees in an effort to increase the number of students in AP courses who participate in the AP exam.
  - Analysis was used to determine the criteria for site selection
- **Advanced Placement Rural Expansion Pilot**
  - Analysis lead to the development of this pilot, which will provide rural schools assistance in starting AP programs
  - Using data from this research, we identified rural schools that have AP-ready students but do not currently offer AP courses.

Observations from New York & Future Research Directions

Chris Avery
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Updating Algebra for All?:
Evidence of a middle-grades math acceleration policy

Darryl Hill

Coauthors:
Shaun Dougherty
Joshua Goodman
Erica Litke
Lindsay Page

Motivation

- Observational data suggest connection between taking algebra and taking more math, and positive college outcomes. (Gamoran & Hannigan, 2000; Adelman, 2006)
- Black & Latino students are underrepresented in advanced courses, particularly algebra. (Moses & Cobb, 2001)
- Algebra-for-all has been tried in Charlotte, Chicago and California; may harm "misplaced students." (Loveless, 2008; Nomi, 2012)
- Evidence is mixed. (Allenswoth et al, 2009; Burris et al, 2006; Clotfelter, Ladd, & Vigdor, 2011; Rickles, 2011; Stein et al, 2011)
- Some districts and states have made policy shifts as a result of negative outcomes (Fensterwald, 2013)
- Relationship/ role of increasing competition at low end in advanced courses

The Math Acceleration Policy in Wake County

- 15th largest school district in the US (>150,000 students)
  - 50% White, 25% Black, 15% Hispanic, 6% Asian.
  - One-third are eligible for free or reduced-price lunch
- Task force focusing on equity for disadvantaged and minority students pushed for increased access to Algebra I in middle school.
- SAS's Education Value-Added Assessment System (EVAAS) predicts probability that a student will pass Algebra I End-of-Course exam.
- Starting in 2010-11, students with EVAAS ≥ 70% were recommended for Advanced 6th grade Math (6), Pre-Algebra (7), or Algebra I (8).
- A directive from the superintendent led to stronger compliance with this rule in the 2011-2012 school year.
- WCPSS now a partner with the Strategic Data Project to research outcomes and inform policy decisions.

Empirical strategy

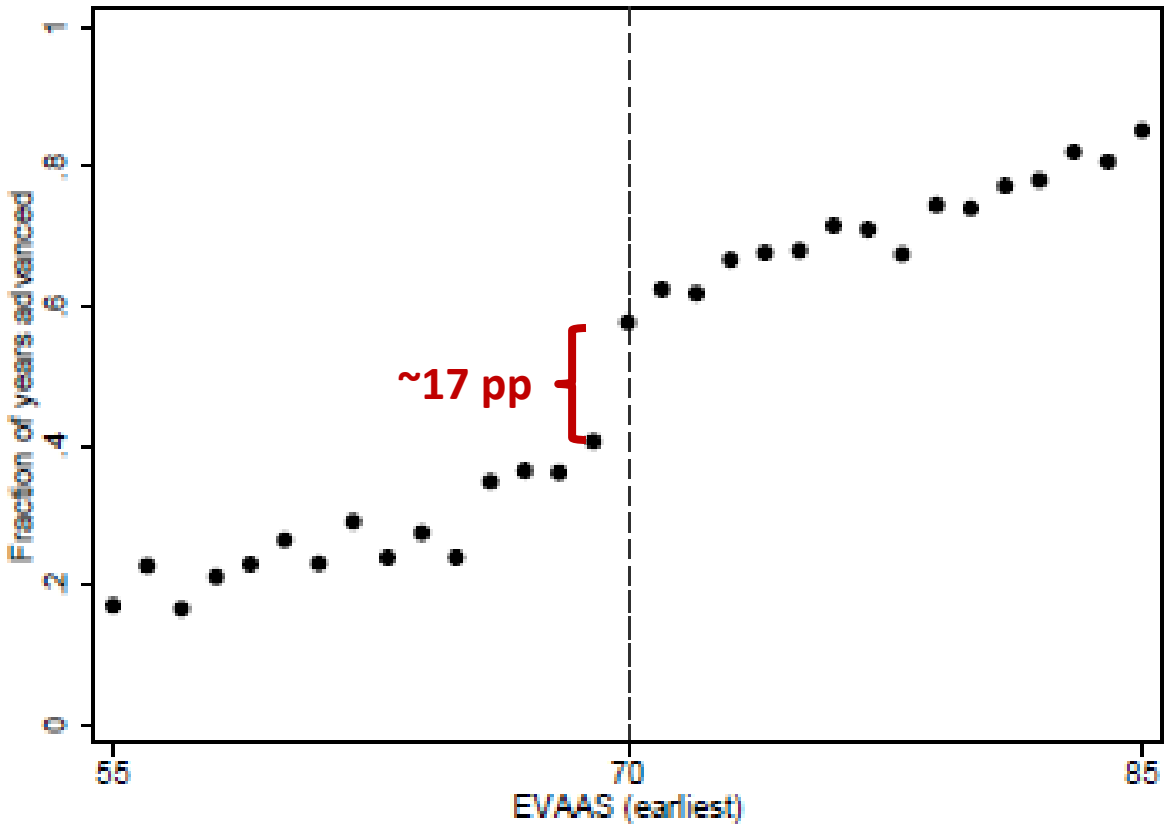
- A **fuzzy regression discontinuity design** compares students who barely qualified for acceleration to those who barely missed qualifying, two nearly identical groups but for math placement.
- We fit the following RD model in which *share of years in advanced math* has been instrumented by having an EVAAS probability of at least 70% (*Elig*=1):

$$Y_{it} = \beta_0 + \beta_1 \cdot Advanced_{\text{it}} + \beta_2 \cdot EVAAS_{it} + \beta_3 \cdot Elig_{\text{it}} \cdot EVAAS_{it} + \mu_{it}$$

- β_1 measures the impact of math acceleration on students induced to enroll as a result of the assignment rule.
- Running variable is each student's end of 5th grade EVAAS score, to avoid endogeneity concerns.

Math acceleration rates

- Clear discontinuity in share of middle-school math years spent in advanced math coursework at the assignment threshold, implying a strong first stage.



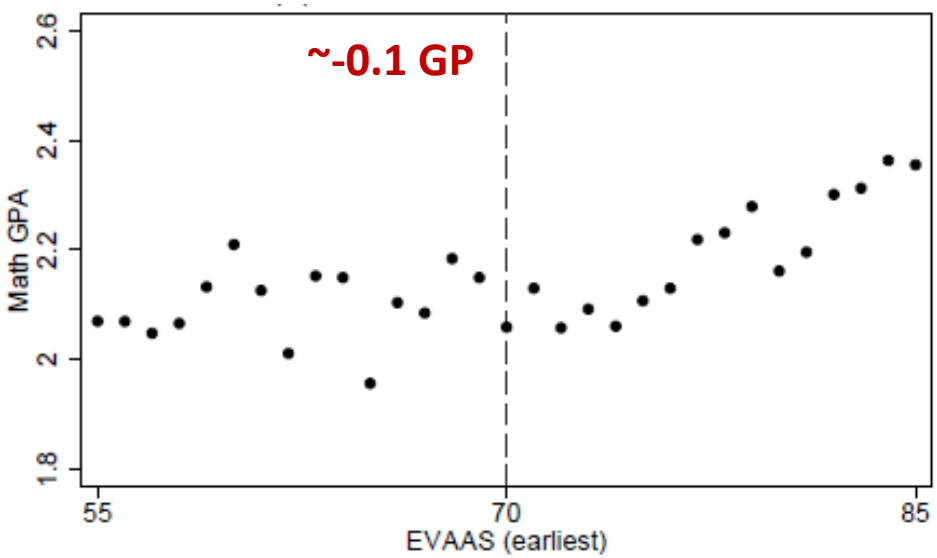
Components of the treatment

- Students at or above the 70% probability threshold were recommended for classes designated as advanced.
- Accelerated students were in classes with:
  - Much more highly skilled peers (1.3 standard deviations higher)
  - Fewer minority peers (29 pp increase in % of peers white/Asian)
  - More students (accelerated classes were 4 students larger)
  - No difference in peer heterogeneity (measured by st. dev. of skill)
- Accelerated students were:
  - More likely to be a taught by a novice (7.2 percentage points)
  - Less likely to be taught by a teacher in lower-tail of ability (34 percentage points)

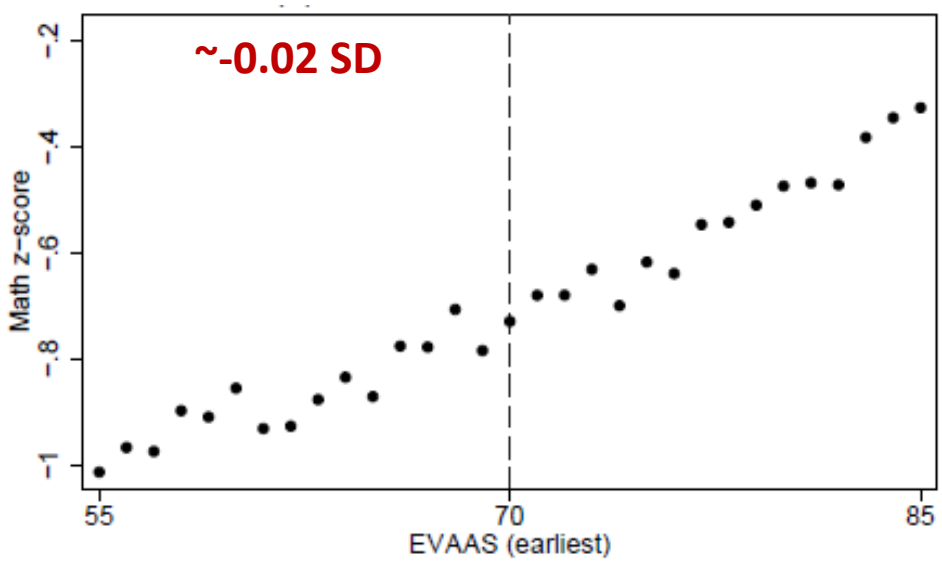
Outcomes: Math GPA & Test Scores

- Modest negative impacts on Math GPA
- Little clear overall impact on end-of-grade math test scores

Math GPA



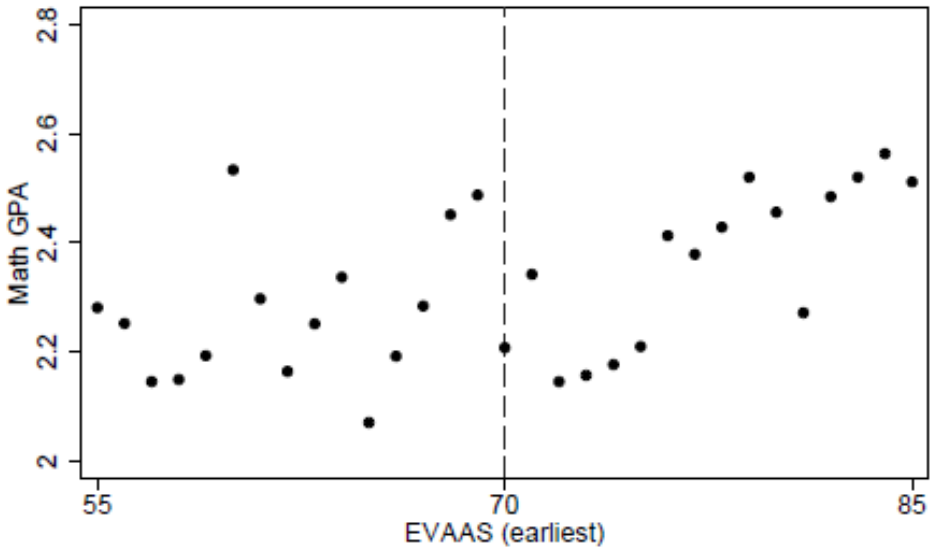
Math Z-score



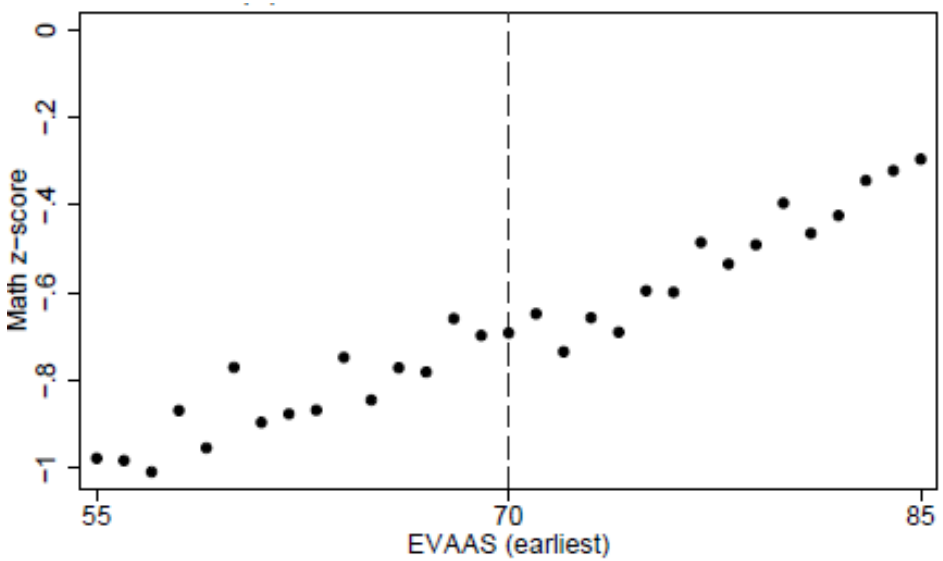
Outcomes: Heterogeneity of effect

- Negative effects are particularly large for female students (possible small difference in take-up).

~ -0.2 GP Math GPA



~ -0.07 SD Math Z-score



Sensitivity Tests

- No difference in first-stage take up of treatment by gender, race/ethnicity, or low-income status.
- Gender results not sensitive to choice of bandwidth.
- Results are stronger (though power more limited) when we drop the first year of implementation.
- These results are preliminary.

Implications

- We provide preliminary evidence of negative impact of middle-school math acceleration on short-run measures of student achievement.
- Negative results are largely driven by girls, with no differential effect by race/ethnicity.
- Girls more at risk for internal distress at challenging times in their educational trajectory (Angold & Rutter, 1992) and most vulnerable when doing poorly in school (Pomerantz et al., 2002)
- We hypothesize that the higher math track may be a more competitive environment and that girls induced by the policy to enroll respond negatively given their position as lower performers relative to the rest of class (Niederle & Rustichini, 2003; Niederle & Vesterlund, 2010).

Next steps

- How do the patterns in test scores relate to students self-perceptions?
- Are students induced into advanced math in middle school more likely to complete a college-preparatory curriculum in high school?
- How do these short-run effects for girls impact long-term likelihood of enrolling and succeeding in higher-level math courses?
- What can we learn from cross-school variation in policy implementation?
- What is the impact of the policy on behavioral outcomes and attendance?

QUESTIONS?