

Student Assessment and Placement Systems Using Multiple Measures

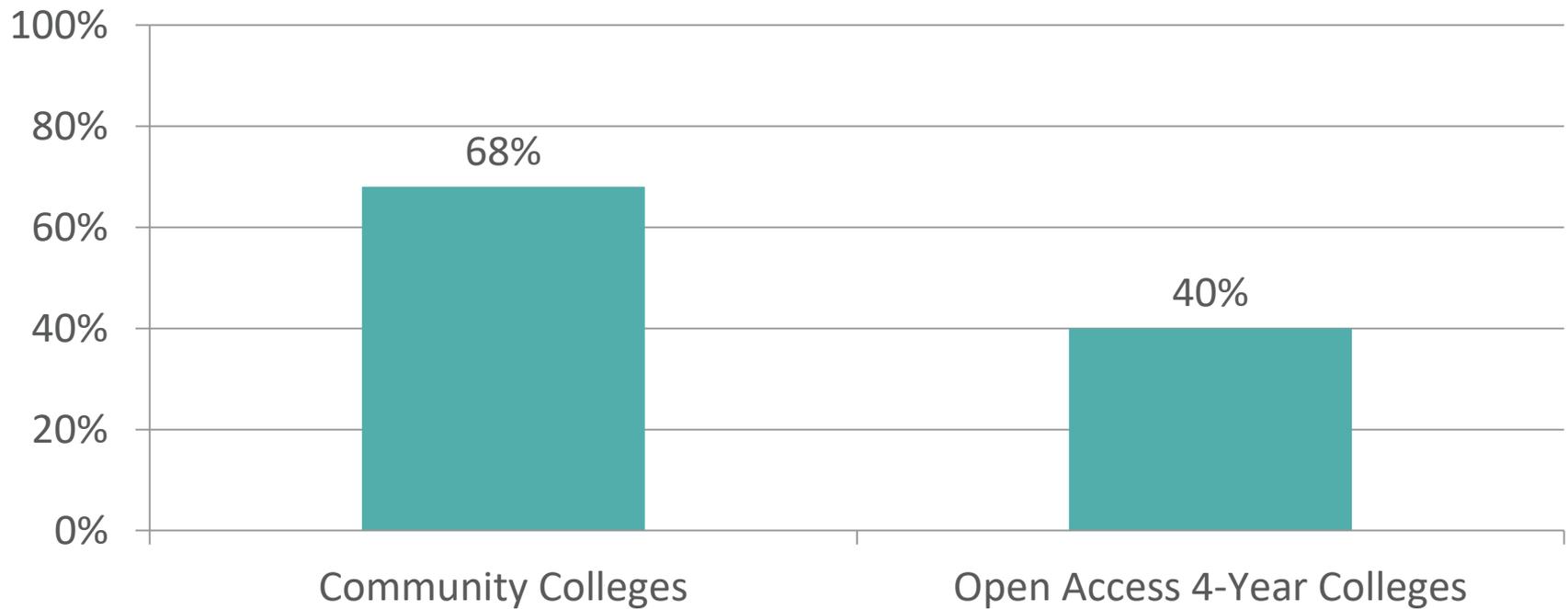
Elisabeth Barnett, CCRC

SUNY CAO Meeting
October 2018

Agenda

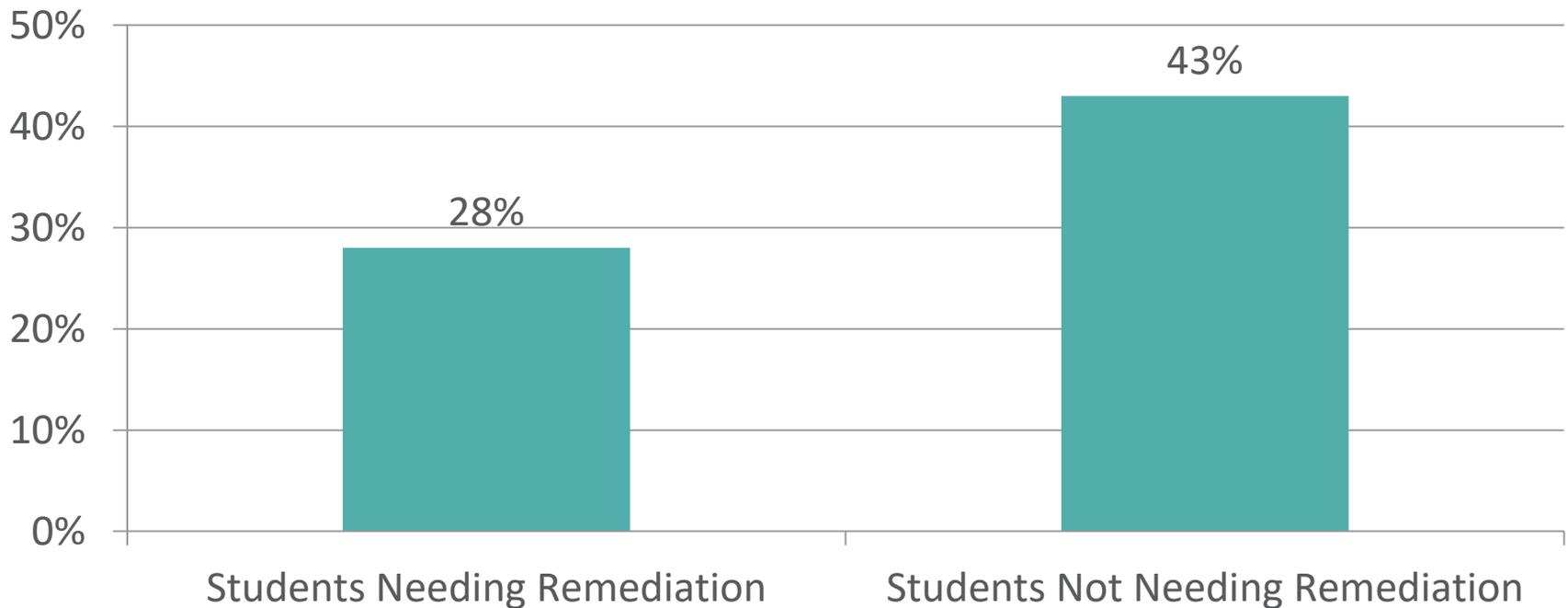
- Why use multiple measures for placement
- Selection of a multiple measures system
- Results of the SUNY research
- Discussion

Students needing 1+ developmental education course (NCES, 2013)



Community college 8-year graduation rates

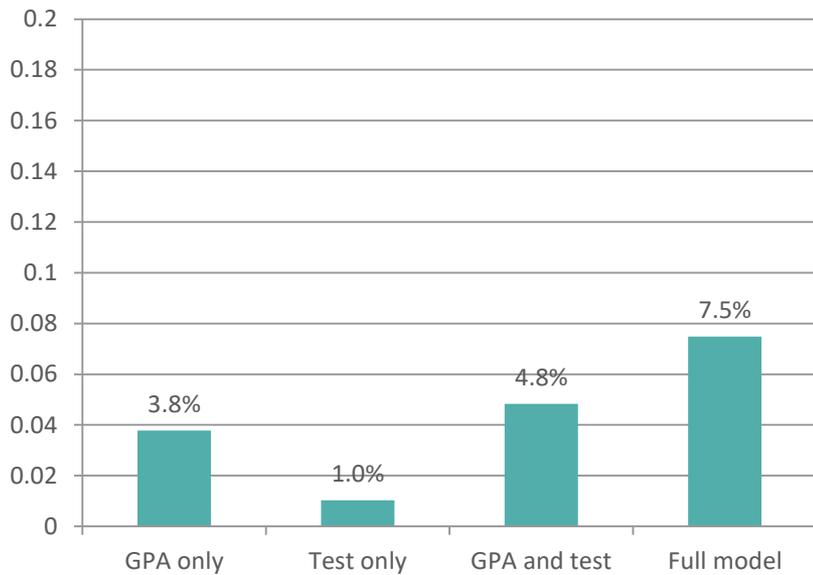
(Attewell, Lavin, Domina, and Levey, 2006)



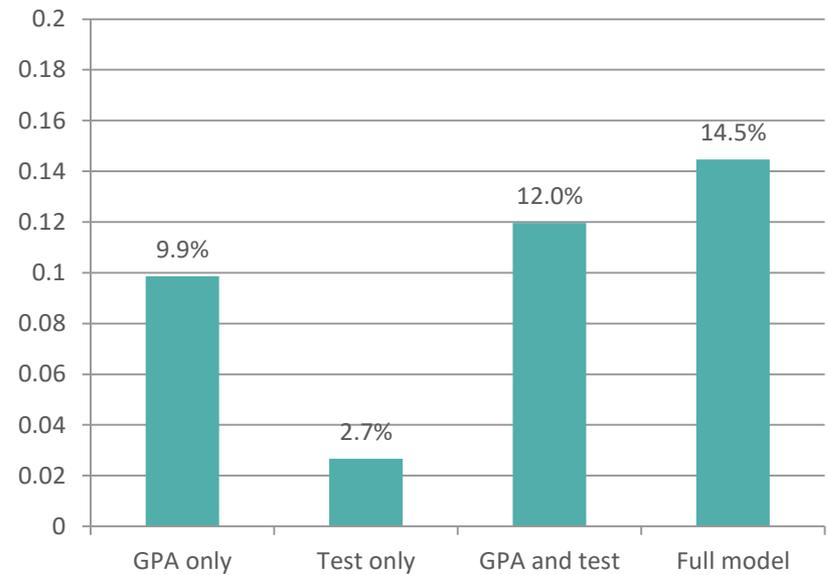
Under-placement and Over-placement

		Placement According to Exam	
		Developmental	College Level
Student Ability	Developmental		<p>Over-placed <i>(English – 5%)</i> <i>(Math – 6%)</i></p>
	College Level	<p>Under-placed <i>(English – 29%)</i> <i>(Math – 18%)</i></p>	

COLLEGE 2: ENGLISH

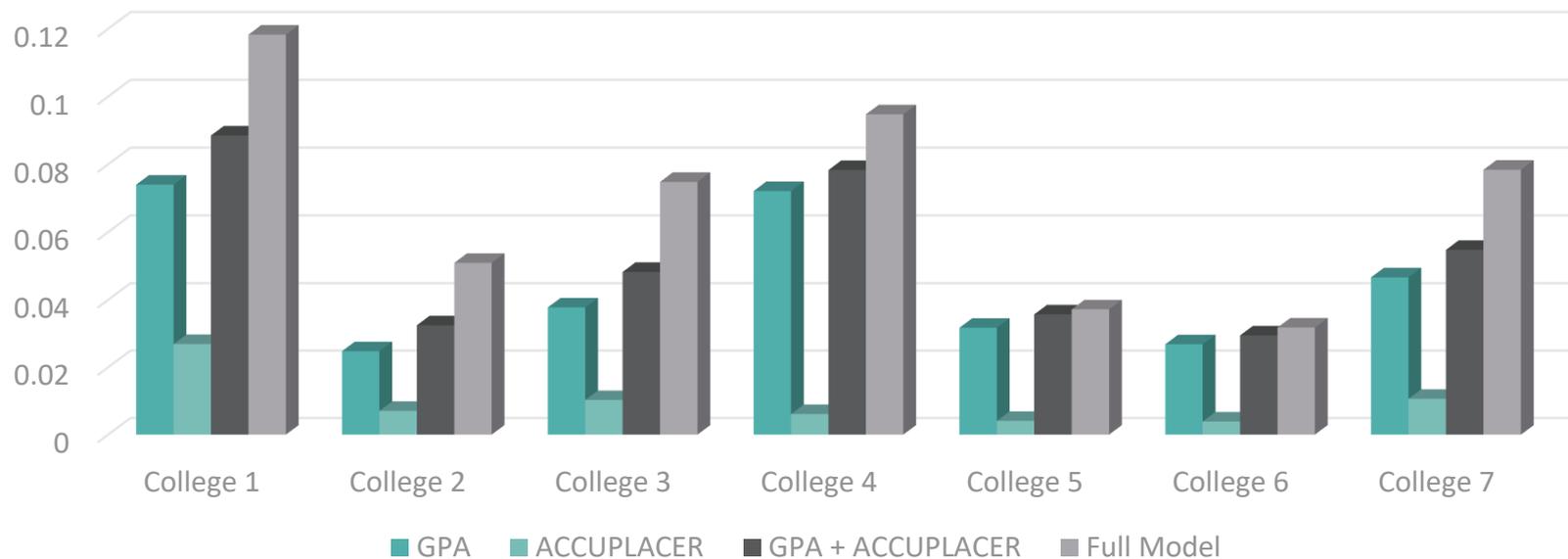


COLLEGE 2: MATH



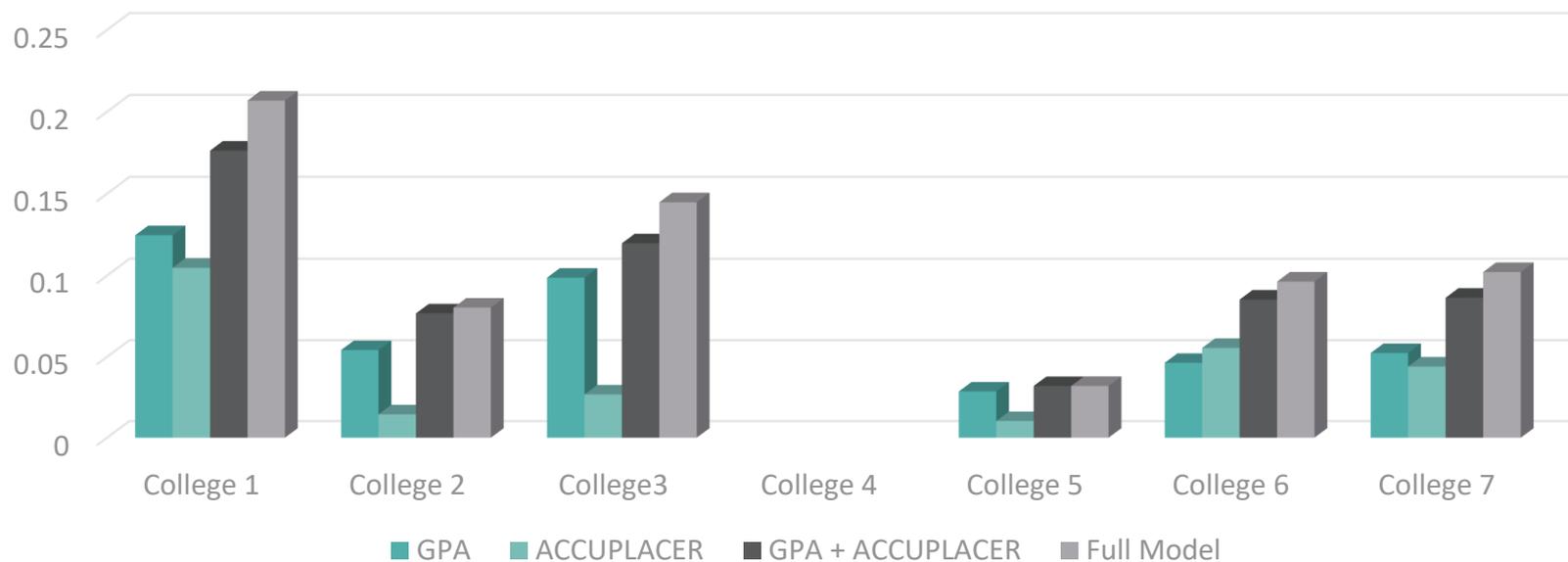
Model R-Squared Statistics English

R-Squared Statistics – Graphical Representation



Model R-Squared Statistics Math

R-Squared Statistics – Graphical Representation



Conclusions so far

- Students placed into developmental education are less likely to complete.
- Better assessment systems are needed.
- HS GPA is the best predictor of success in college math and English.

Multiple Measures Assessment

Why Use Multiple Measures

- Existing placement tests are not good predictors of success in college courses.
- More information improves most predictions.
- Different measures may be needed to best place specific student groups.

Multiple Measures Options

MEASURES	SYSTEMS OR APPROACHES	PLACEMENTS
<p><u>Administered by college:</u></p> <ol style="list-style-type: none"> 1. Traditional or alternative placement tests 2. Non-cognitive assessments 3. Computer skills or career inventory 4. Writing assessments 5. Questionnaire items <p><u>Obtained from elsewhere:</u></p> <ol style="list-style-type: none"> 1. High school GPA 2. Other HS transcript information (courses taken, course grades) 3. Standardized test results (e.g., ACT, SAT, Smarter Balanced) 	<ul style="list-style-type: none"> • Waiver system • Decision bands • Placement formula (algorithm) • Decision rules • Directed self-placement 	<ul style="list-style-type: none"> • Placement into traditional courses • Placement into alternative coursework • Placement into support services

Possible Measures

Which would you want to use? Why or why not?

Type	Examples
Placement test	Accuplacer ALEKS
High school GPA, course grades, test scores	Self-report From transcript
Non-cognitive assessments	GRIT Questionnaire SuccessNavigator or Engage
Career inventory, computer skills	Kuder Career Assessment Home grown computer skills test
Writing examples	Faculty-assessed portfolio Home-grown writing assessment

Sources of HS transcript data

- The students bring a transcript.
- The high school sends.
- Obtained from state data files.
- Self report.

Note: Consider using the 11th grade GPA.

Self-report research

- UC admissions uses self-report but verifies after admission. In 2008, at 9 campuses, 60,000 students. No campus had >5 discrepancies b/w reported grades and student transcripts (Hetts, 2016)
- College Board: Shawn & Matten, 2009: “Students are quite accurate in reporting their HSGPA”, $r = .73$.
- ACT research often uses self-reported GPA and generally find it to highly correlated with students actual GPA: ACT, 2013: $r = .84$.

Non-cognitive assessments

Development of non-cognitive skills promotes students' ability to think cogently about information, manage their time, get along with peers and instructors, persist through difficulties, and navigate the landscape of college...(Conley, 2010).

Non-cognitive assessments may be of particular value for:

- Nontraditional (older) students.
- Students without a high school record.
- Students close to the cut-off on a test.

NC 1: Success Navigator

Domains:

- Academic discipline, commitment, self-management, support, social supports

Academic Success Index, includes:

- Projected 1st year GPA
- Probability of returning next semester

Also, *Course Acceleration Indicator*

- Recommendation for math or English acceleration

NC 2: Engage

Domains:

- Motivation and skills, social engagement, self-regulation

Advisor report also has:

- Academic Success Index
- Retention Index

Correlation with GPA and retention, especially Motivation scale.

NC 3: Grit Scale

Domains:

- Grit and self-control.

Provides score 1-5 on level of grit, with 5 as maximum (extremely gritty) and 1 as lowest (not all gritty).

Correlation with GPA and conscientiousness

NC 4: Learning and Study Strategies Inventory (LASSI)

Domains

- Anxiety, attitude, concentration, information processing, motivation, selecting main ideas, self-testing, test strategies, time management, using academic resources.

Correlation with GPA and retention.

Concerns about the HS GPA

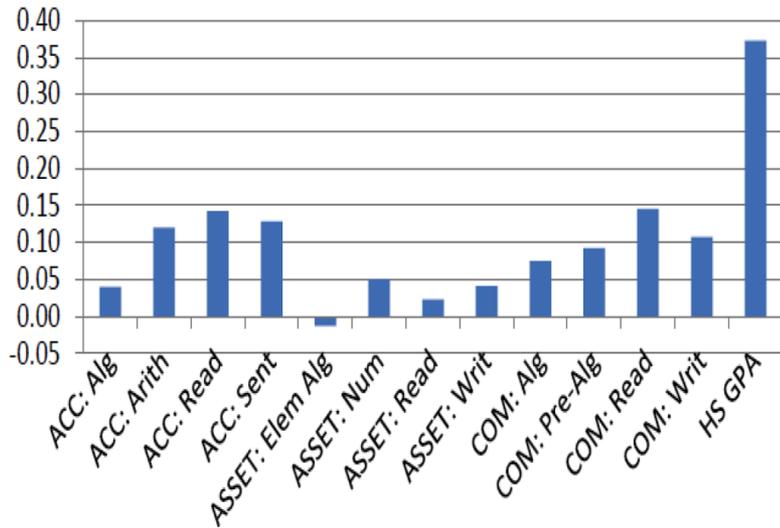
(with thanks to John Hetts, 2016)

- ***Our*** test is different/better/more awesome.
- Students really need developmental education.
- High school GPA is only predictive for recent graduates.
- Different high schools grade differently.

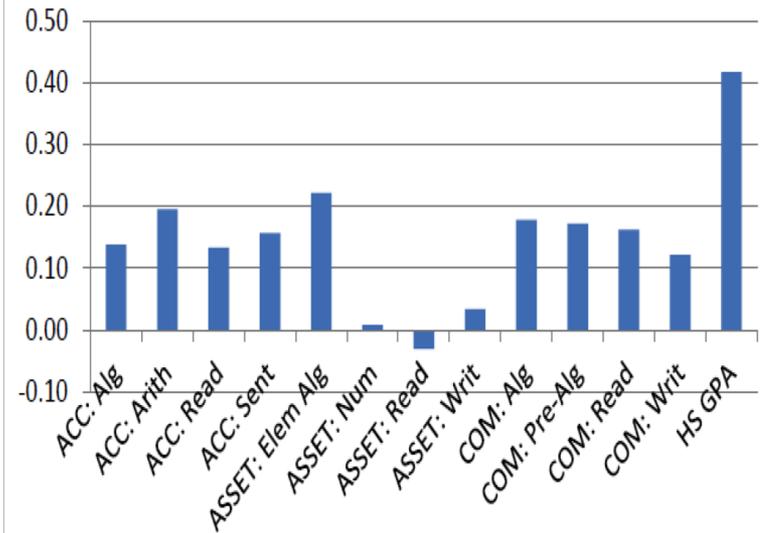
NC ENGLISH

NC MATH

ENG110/111 Grades: Correlation Coefficients



MAT141-171 Grades: Correlation Coefficients

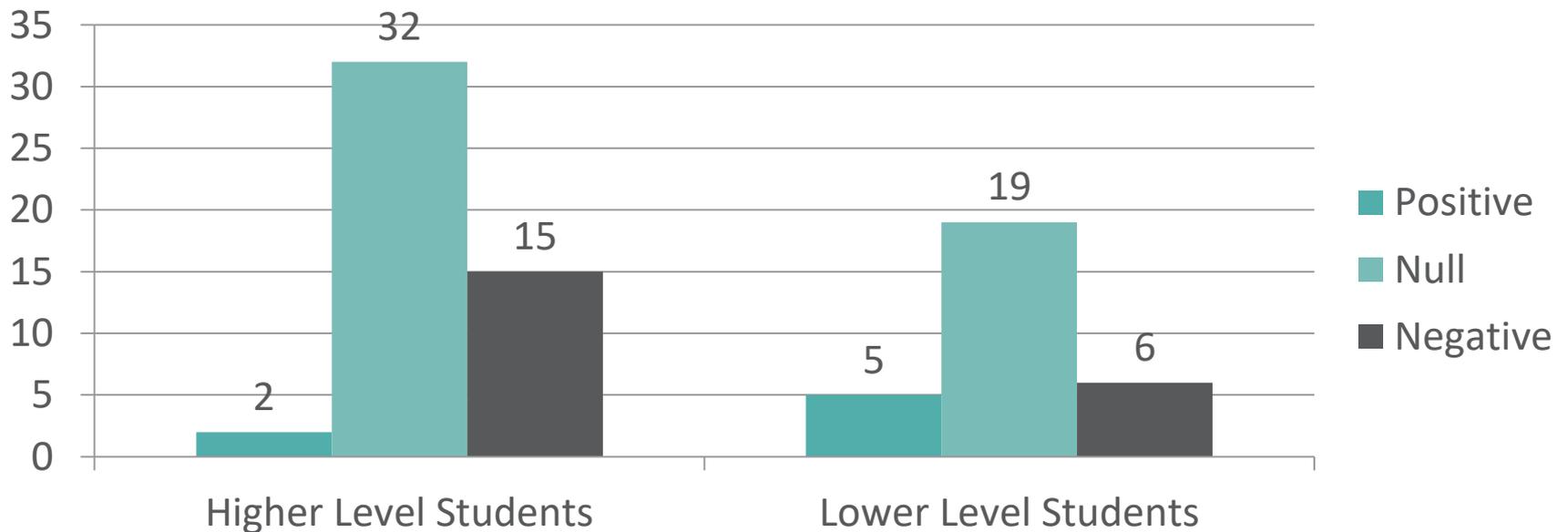


From Bostian (2016), North Carolina Waves GPA Wand, Students Magically College Ready adapted from research of Belfield & Crosta, 2012 – see also Table 1)

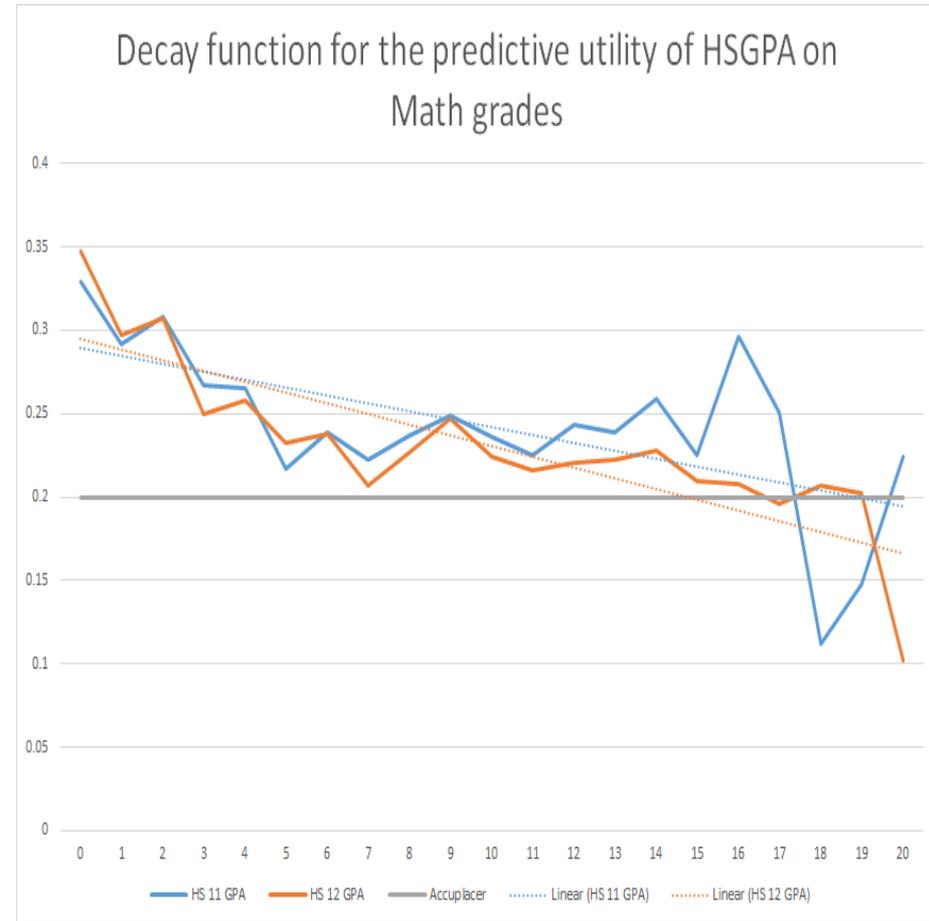
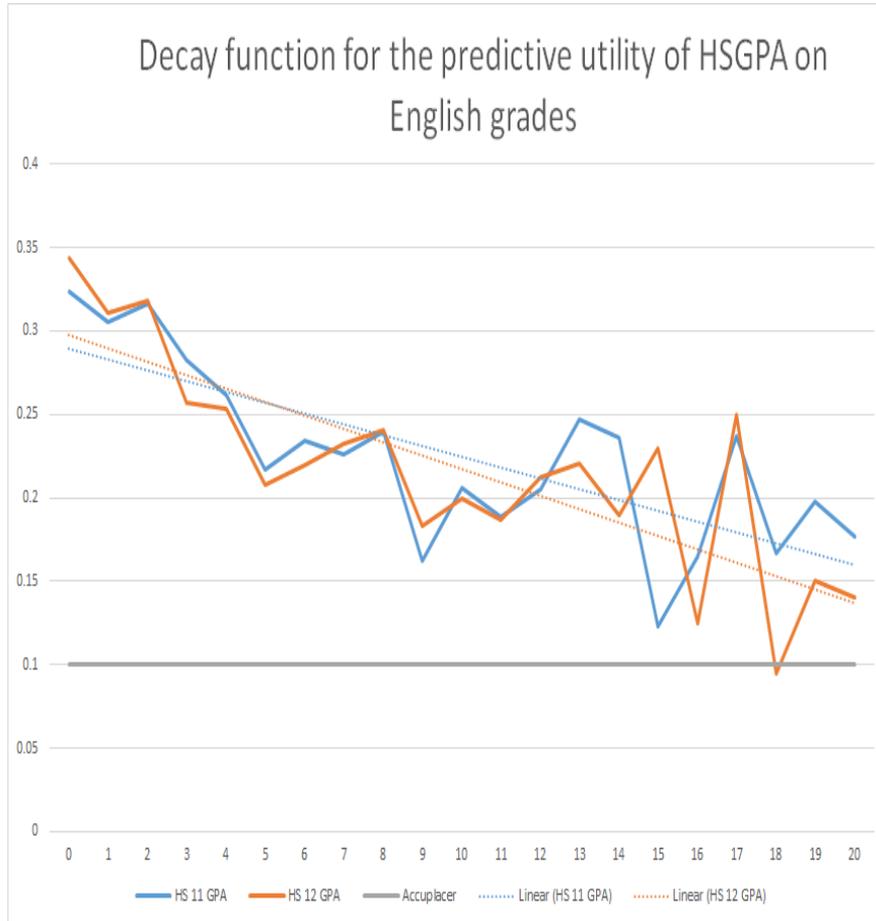
Students would be better off going through developmental education.

Developmental education student outcomes

(Results from 8 studies, CCRC analysis 2015)



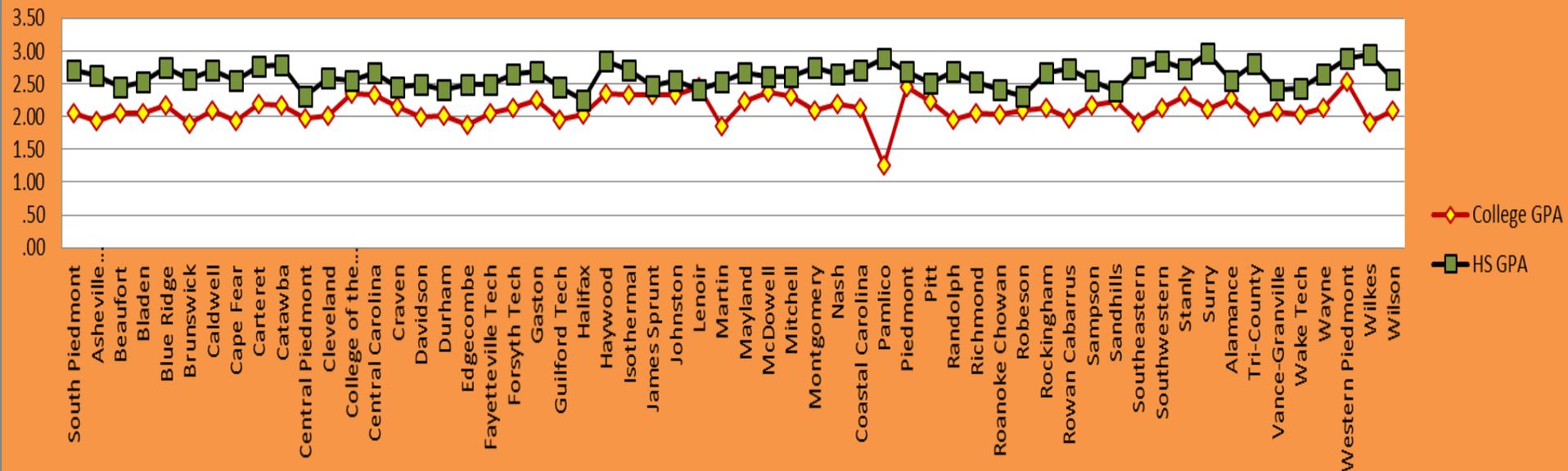
HS GPA is a better predictor than test results for long time (from Hetts, 2016)



MMAP (in preparation): correlations b/w predictor and success (C or better) in transfer-level course by # of semesters since HS

For the most part, college grades stay parallel with feeder high school grades. (Bostian, 2016)

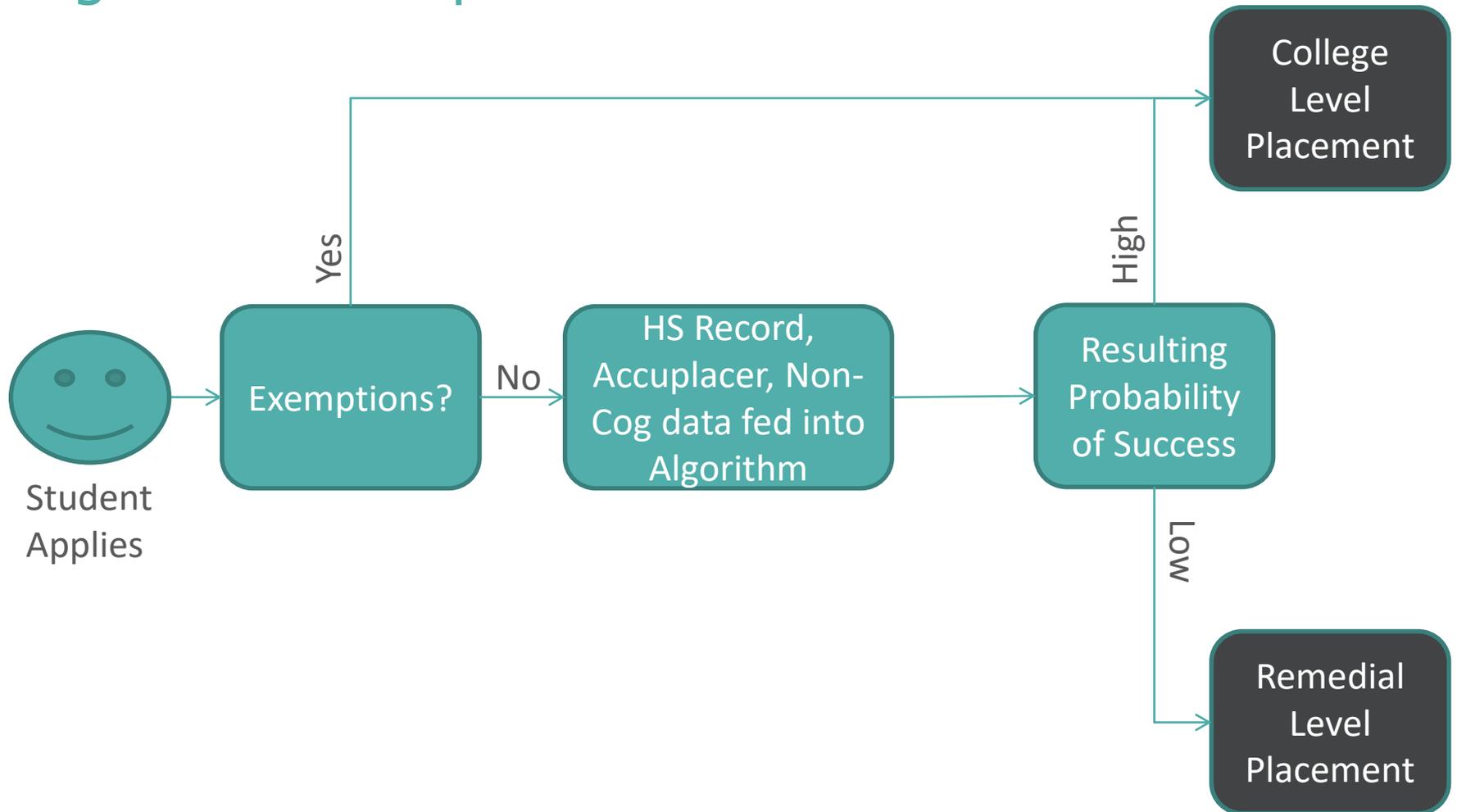
Relationship of High School GPA by School District to College GPA



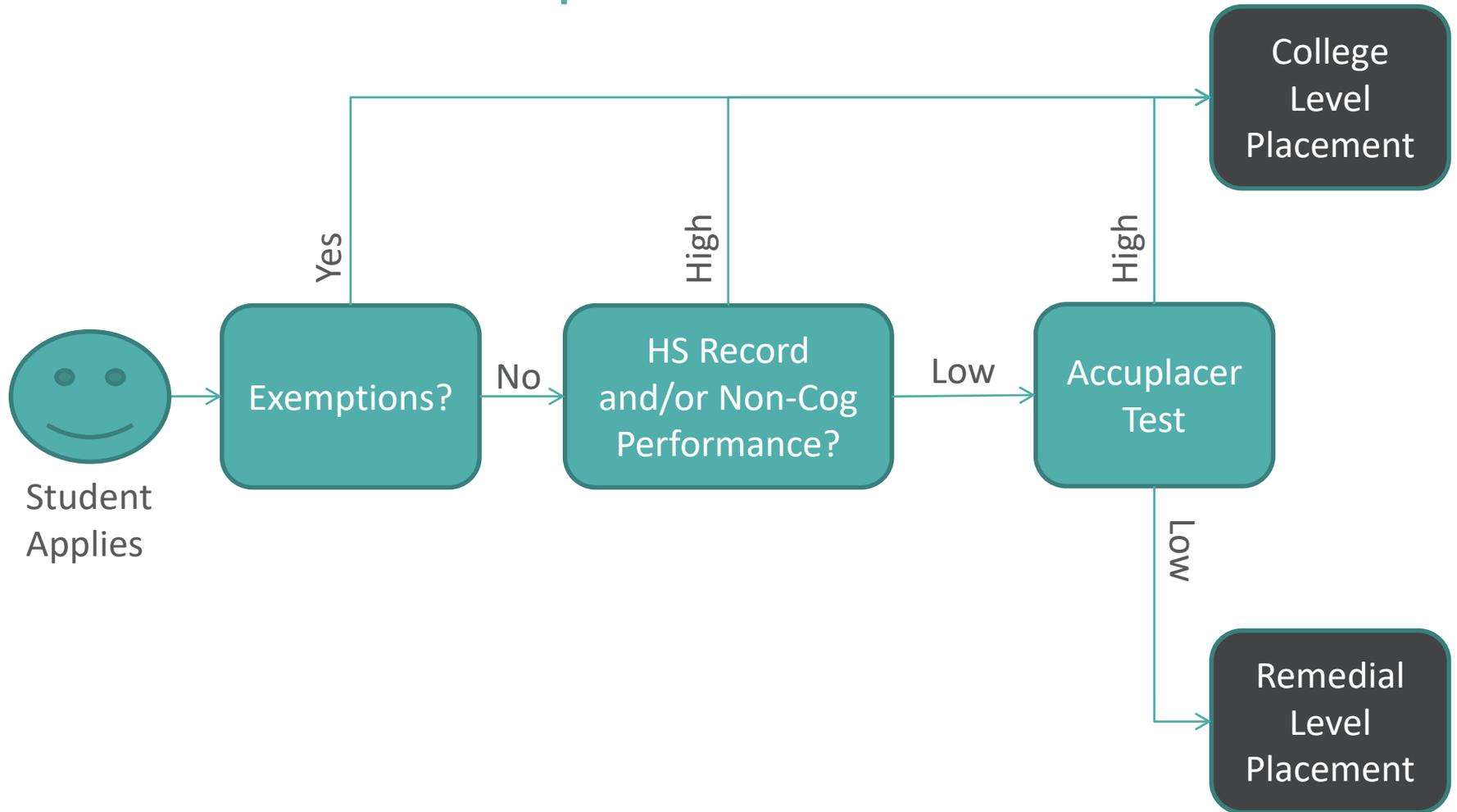
Ways to Combine Measures

- Algorithms:
 - Placement determined by predictive model
- Decision Rules:
 - New exemptions, cutoffs
- Decision Bands:
 - “Bumping up” those in a test score range
- Directed Self-placement:
 - Provide students with information; let them decide where they fit.

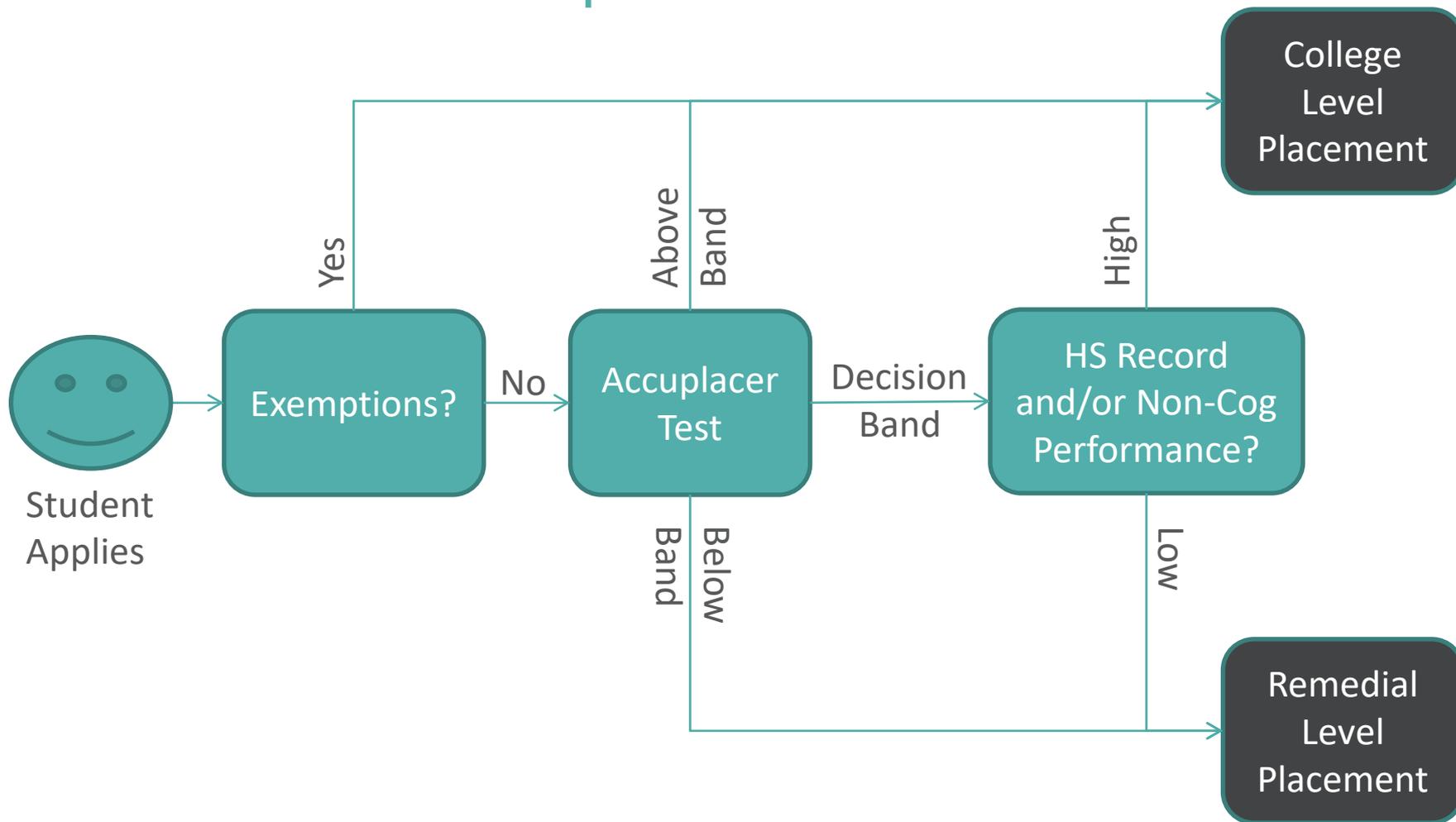
Algorithm Example



Decision-Rule Example



Decision-Band Example



The CAPR Assessment Study

Organization of CAPR

MDRC

CCRC

**Descriptive Study of
Developmental
Education**

**Evaluation of The New
Mathways Project
(RCT in TX)**

**Evaluation of New
Assessment Practices
(RCT in NY)**

Supplemental Studies

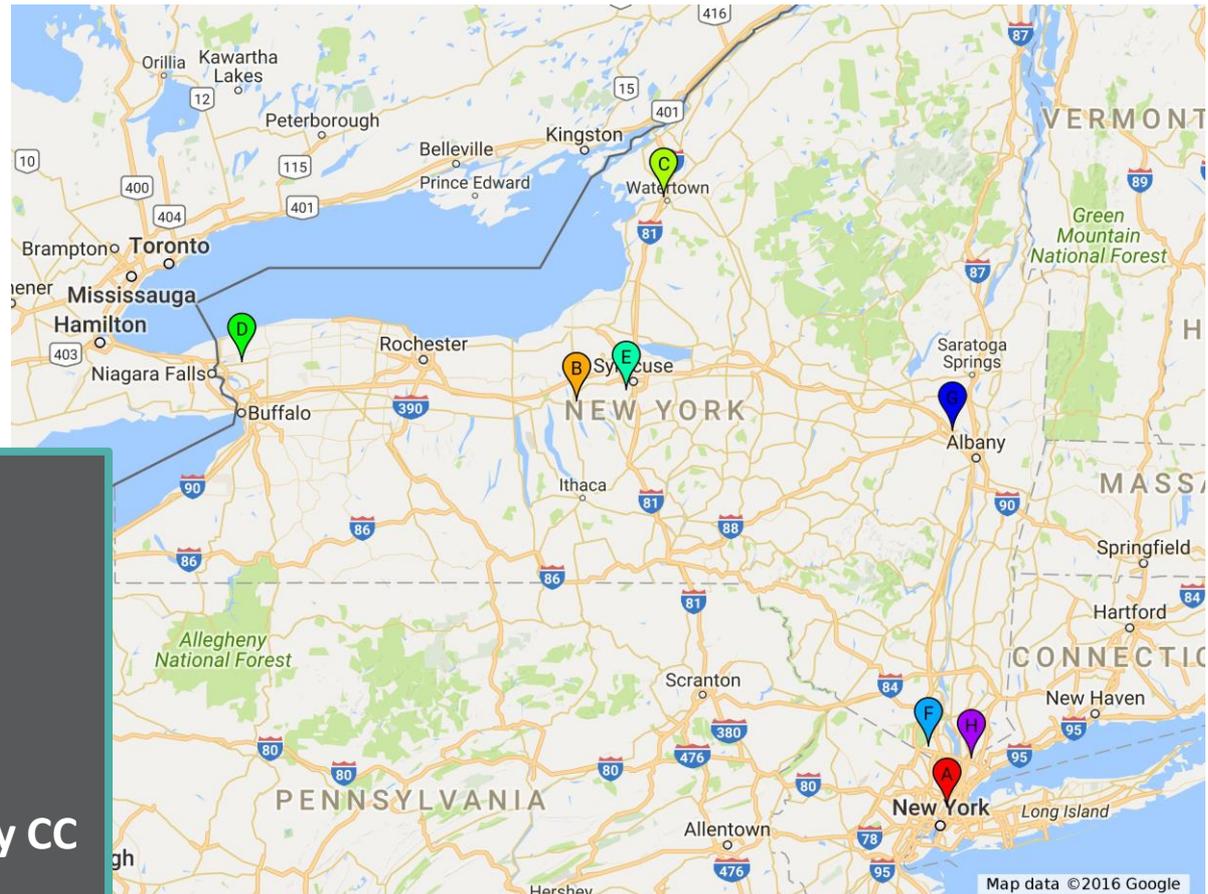
Research on Alternative Placement Systems (RAPS)

- 5 year project; 7 SUNY community colleges
- Evaluation of the use of predictive analytics in student placement decisions.
- Random assignment/implementation/cost study
- Current status: beginning to look at impact

Research Questions (Summary)

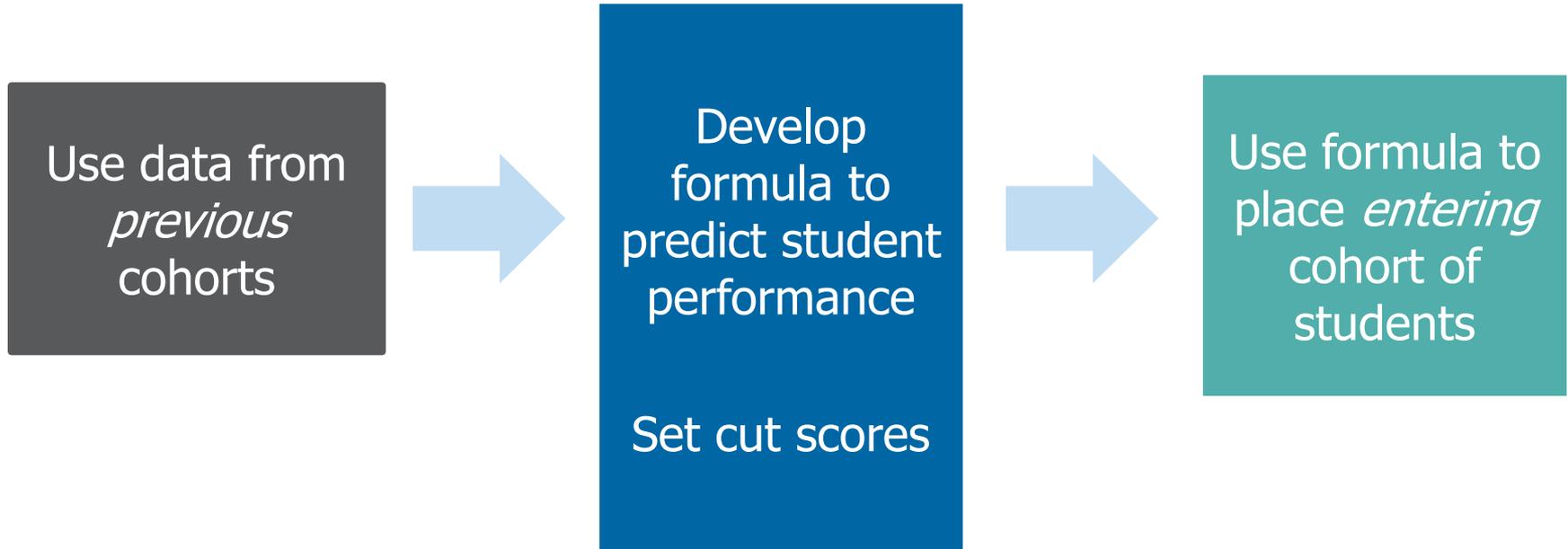
1. Do student outcomes improve when they are placed using predictive analytics?
2. How does each college adopt/adapt and implement such a system?

SUNY Partner Sites



- A – CAPR/CCRC/MDRC
- B – Cayuga CC
- C – Jefferson CC
- D – Niagara County CC
- E – Onondaga CC
- F – Rockland CC
- G – Schenectady County CC
- H – Westchester CC

How Does the Predictive Analytics Placement Work?



Early Findings

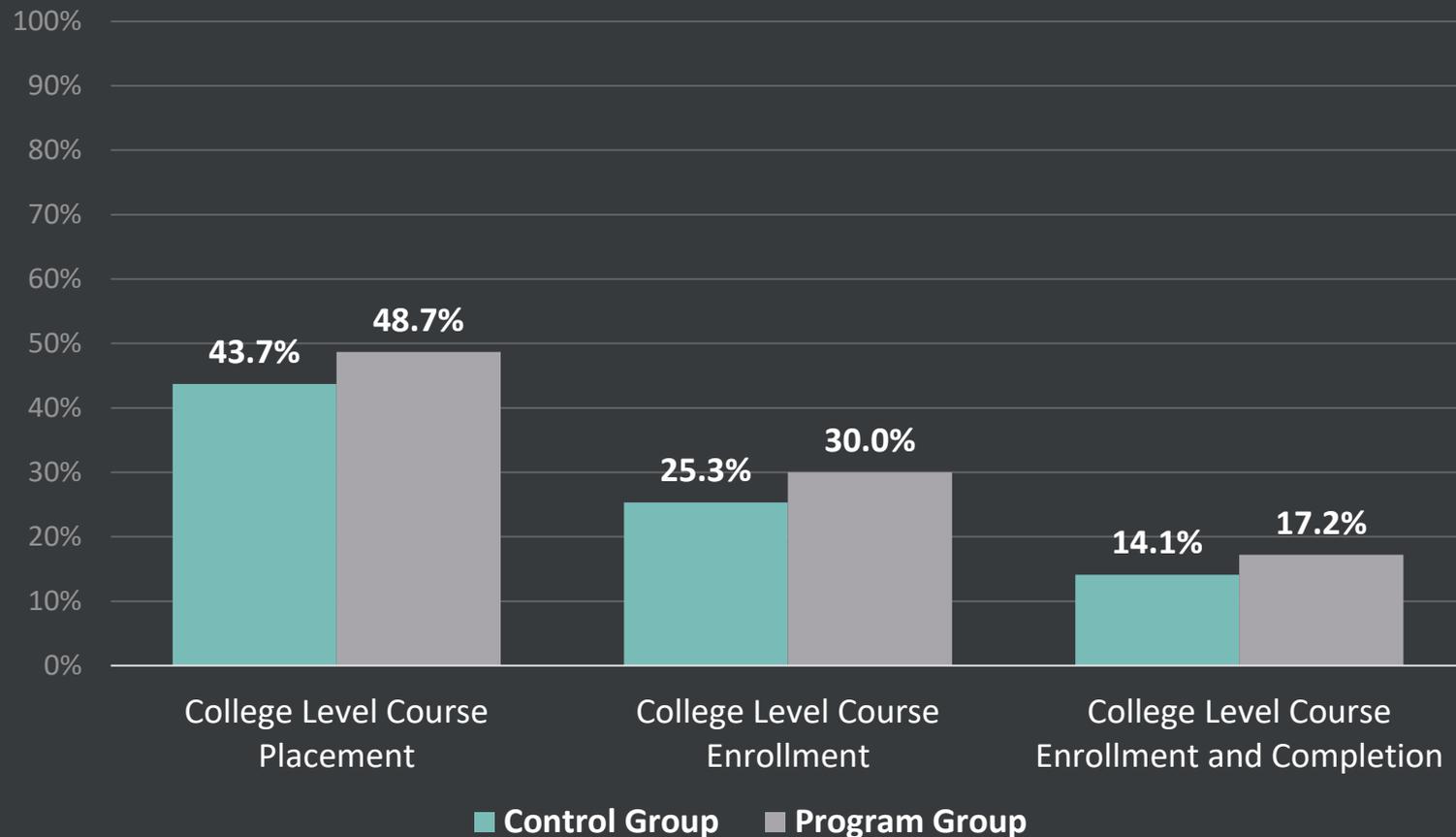
Fall 2017

First Cohort - First Semester (Fall 2016)

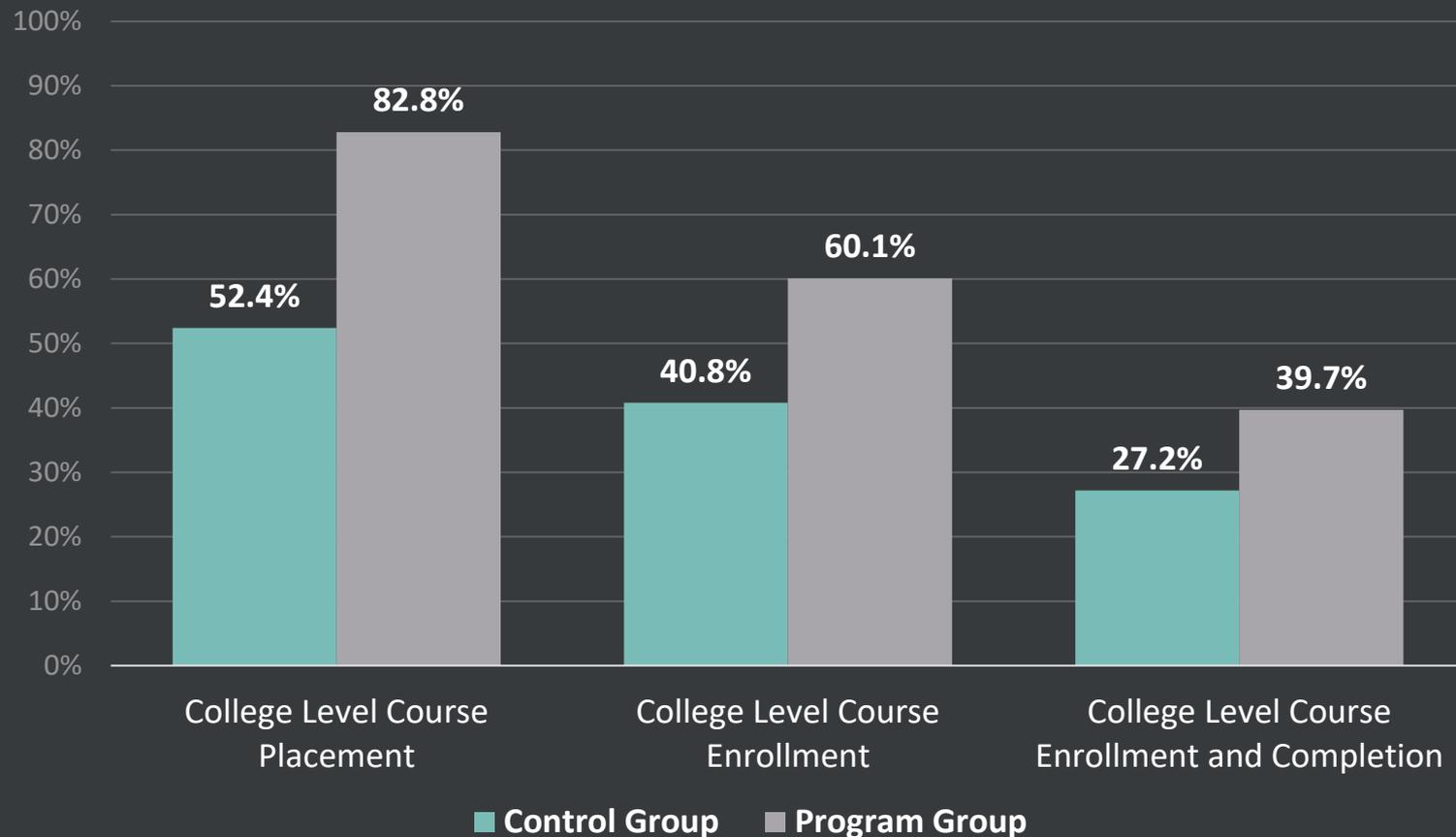
Sample = 4,729 first year students across 5 colleges

- 48% students assigned to business-as-usual (n=2,274)
- 52% students assigned to treatment group (n=2,455)
- 82% enrolled into at least one course in 2016 (n=3,865)

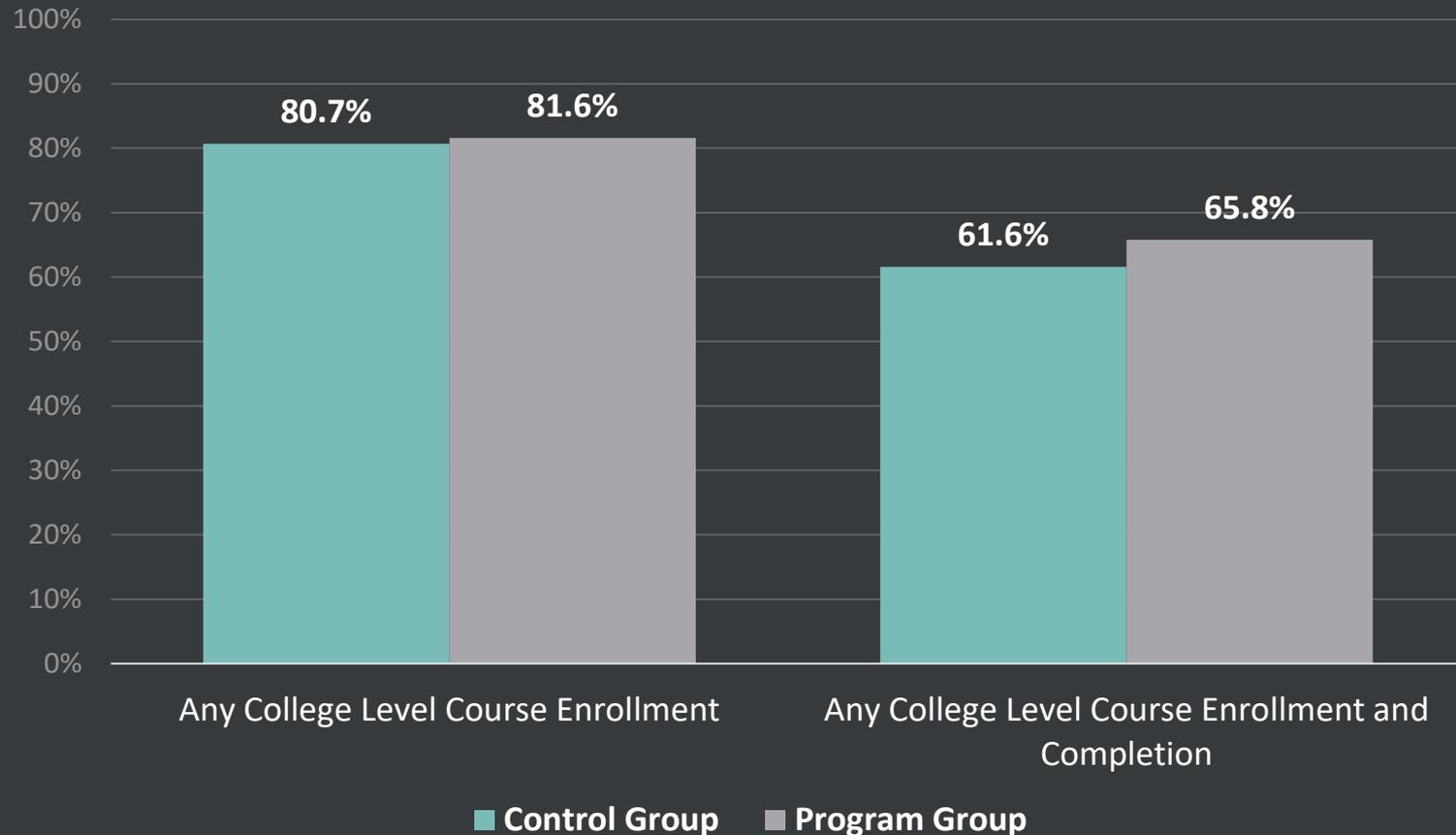
Treatment Effects: Math



Treatment Effects: English



Treatment Effects: Any College Level Course



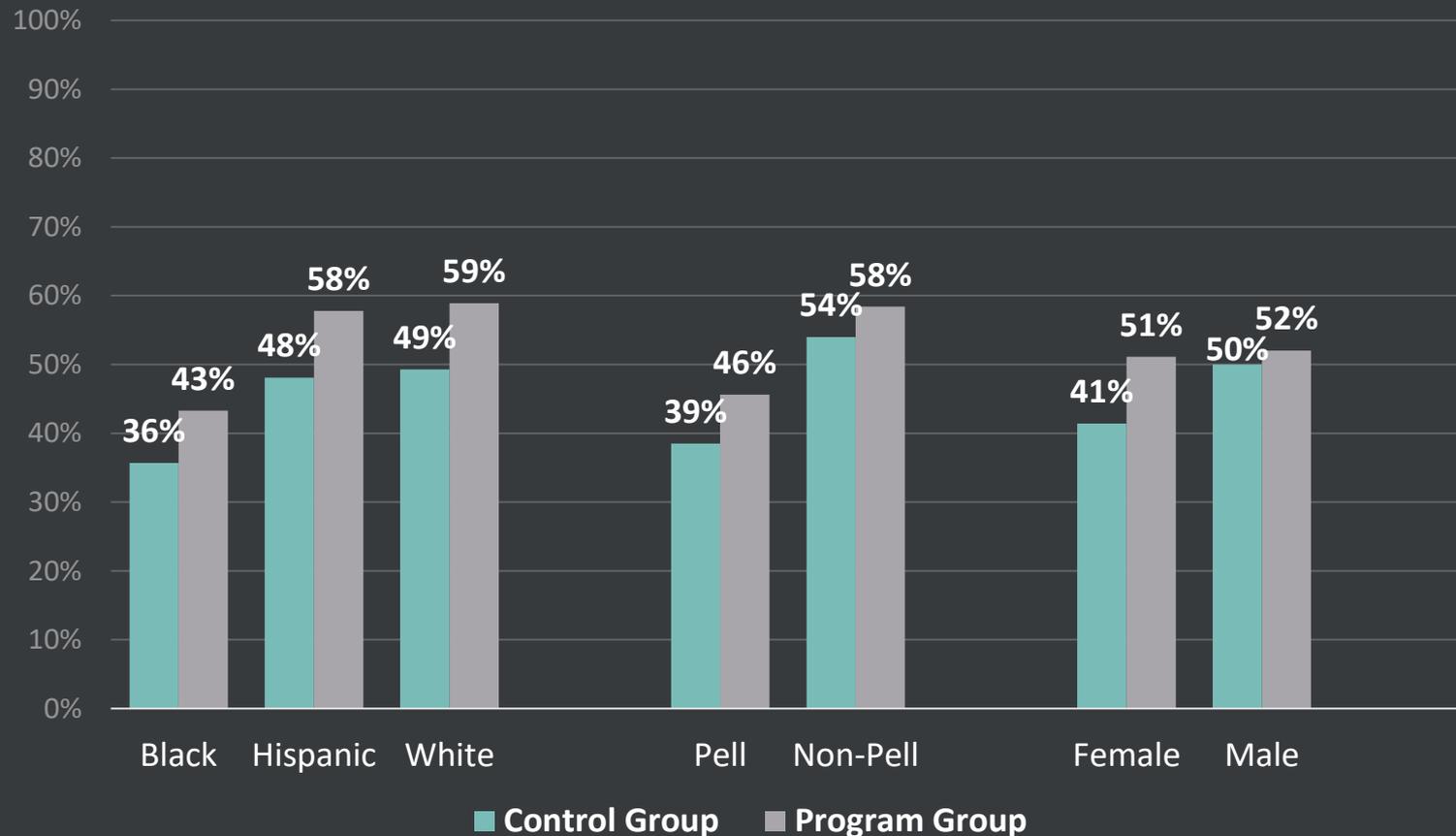
Treatment Effects: Total College Level Credits Earned



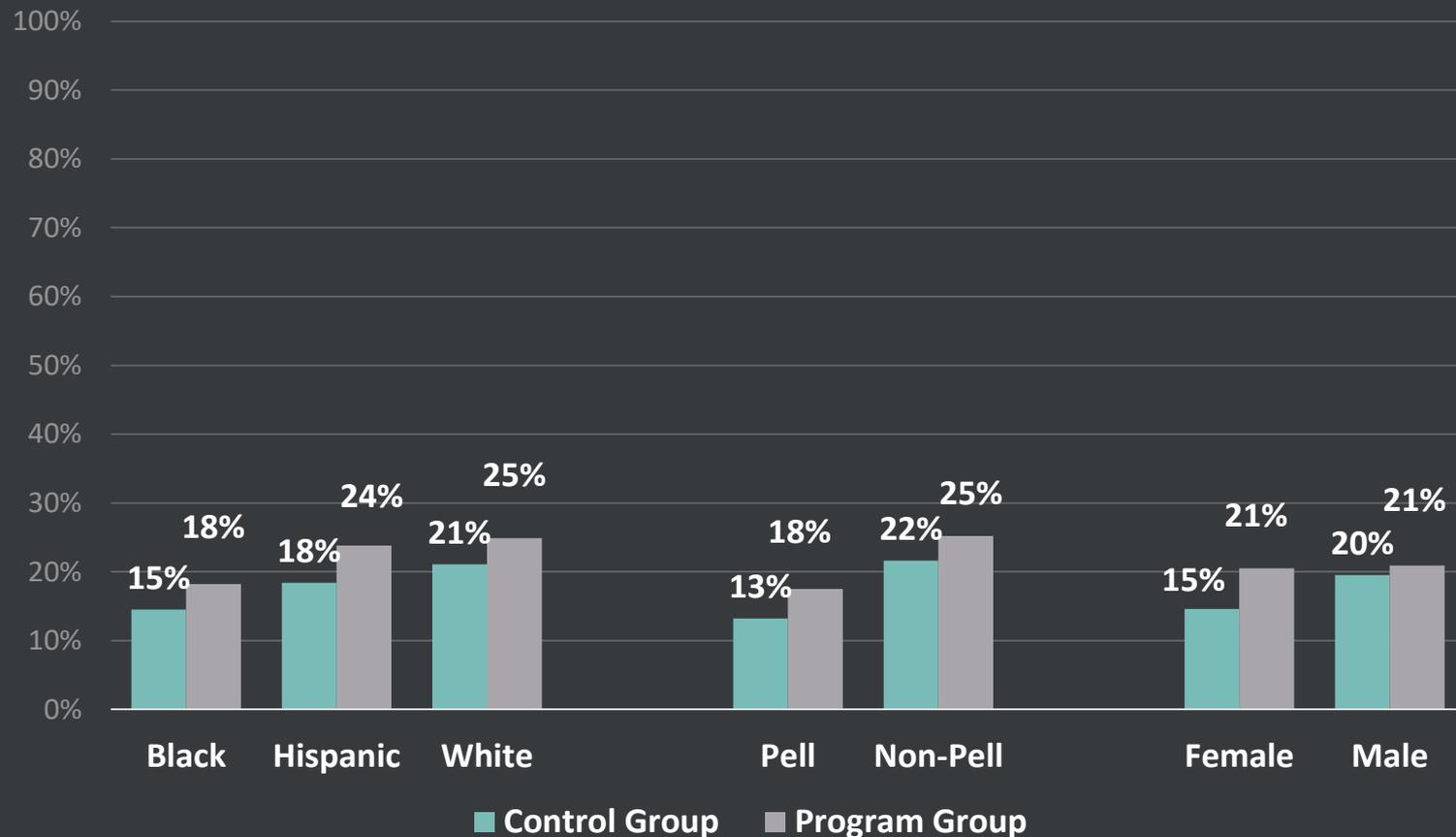
Early Findings – Subgroup Analysis

Fall 2016

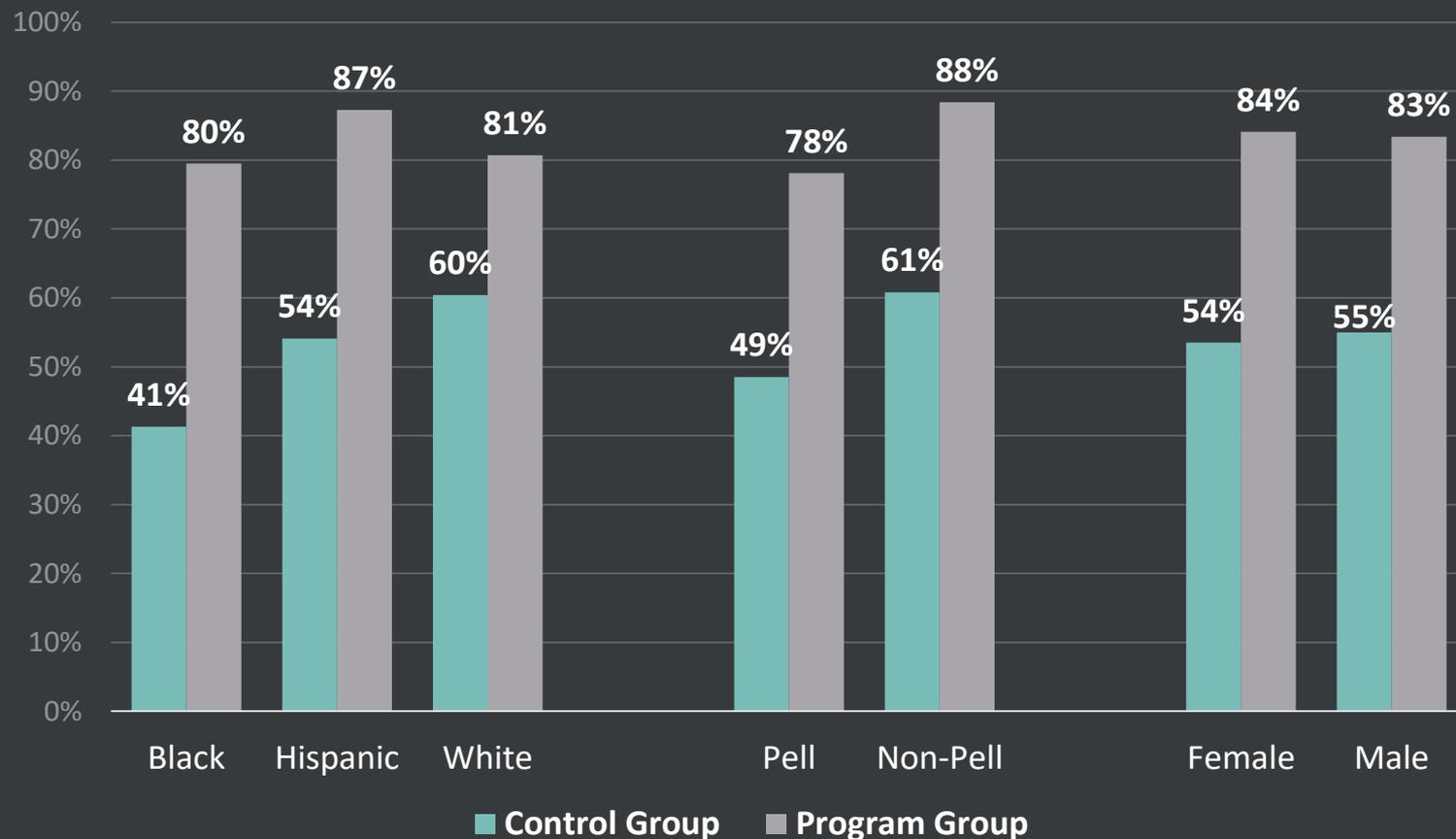
Treatment Effects: College Level Math Placement



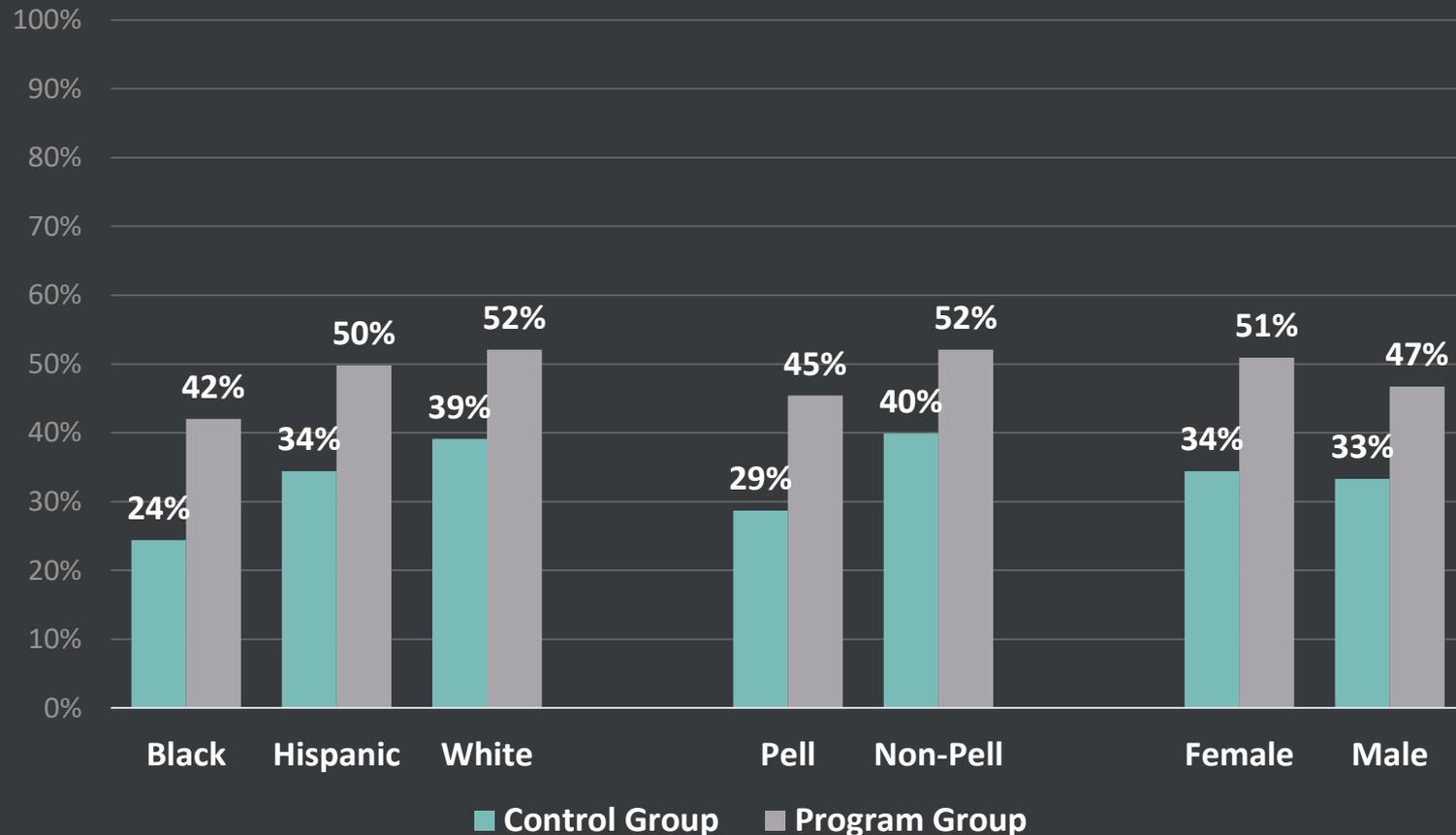
Treatment Effects: College Level Math Completion



Treatment Effects: College Level English Placement



Treatment Effects: College Level English Completion



Costs

- First fall-term costs were roughly \$110 per student above status quo (Range: \$70-\$320)
- Subsequent fall-term costs were roughly \$40 per student above status quo (Range: \$10-\$170)

Reactions? Questions?

Implementation Challenges

Challenge 1

- Lack of data for algorithm due to multiple reforms
 - Placement tests used
 - Course changes
 - Missing HS GPA

“The seventh college in our sample had been using the COMPASS exam, which was discontinued by ACT shortly after this study began.” (report)

Challenge 2

- Concerns about the HS GPA
 - Availability
 - Mistrust of it as a valid predictor of college readiness

*Also, just one other thing is I'm wondering if the GPAs at the various schools can be really seen as being, quote, equal....
(interviewee)*

Challenge 3

- Communications within colleges

Make sure you're involving the right parties. Make sure the decision makers are sitting around the table and make sure they understand the decisions they're making. (interviewee)

I think that's one of the key things that probably came out of all of this for all of us -- to know any kind of changes that we were planning to do with placement testing in general, you'd have to be planning so much further out. (interviewee)

Challenge 4

- Changes requiring forethought
 - IT time was needed
 - Classroom assignments might change
 - Needs for faculty might change

“Department chairs reported that they had to make changes based on different numbers of college developmental and college level sections needed.” (report)

Challenge 5

- Delays in getting placement information to students

These students were used to getting the result, and they want the results right away, and we have to tell them, "You have to wait until the next business day." (interviewee)

College Placement Plans Going Forward

Follow-up Interviews Protocol

- Objectives:
 - Find out colleges plans for placement in the future
 - Identify barriers to continuing to use multiple measures
- Format: ~20 minute phone call
- Respondents: College administrator(s) involved in the study
- Timeline: April/May, 2018

Summary of College Plans for Placement

- A few colleges plan to keep the multiple measures algorithm
 - Additional measures e.g. non-cognitive measure, specific grades
- A few colleges are incorporating multiple measures in other ways
 - Waiver/exemption system
 - Decision tree
- One college using single placement test
- One college replacing single test with transcript data
- Several colleges have separate placement plans for English and Math

Decision Factors

- Colleges that did not keep the algorithm:
 - Need more evidence of impact
 - Found other ways to accelerate college completion
 - Aware of ACCUPLACER Next Gen changes
 - Recognize resource limitations
 - Defer to faculty preferences

Other Key Takeaways

- Strong interest across colleges to move away from testing
- Agreement that GPA/high school transcript data can be used to improve placement
- Faculty buy-in key/faculty preferences determine placement plans
- English faculty favored algorithm over math faculty
- Research helped but need final results

Contact Us

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