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Evaluation of a Multiple Measures Placement System Using Data Analytics

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Agenda

- Why use multiple measures assessment for placement

- The national picture

- Multiple measures options in the current moment

- What we learned from research

Multiple Measures

Definition of Multiple Measures Assessment

….a system that combines two or more measures to place students into appropriate courses and/or supports.

(Barnett and Reddy, 2017)

Percent of Colleges Using Measures Other than Standardized Tests for Assessment
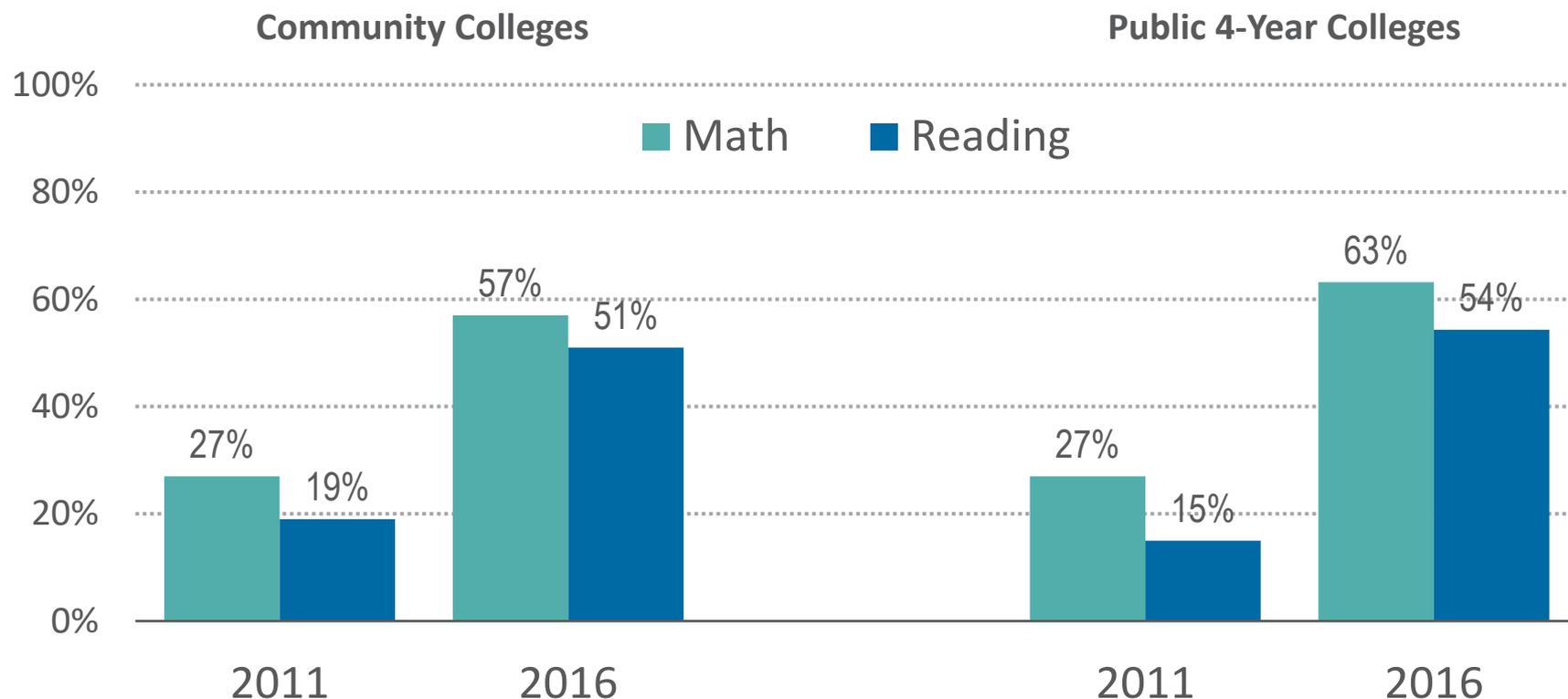
SOURCES: 2011 data from Fields and Parsad (2012); 2016 data from CAPR's institutional survey.
NOTE: The Fields and Parsad (2012) reading statistics are for reading placement only, whereas the CAPR survey data are for both reading and writing.

Processes Used to Determine College Readiness in Community Colleges
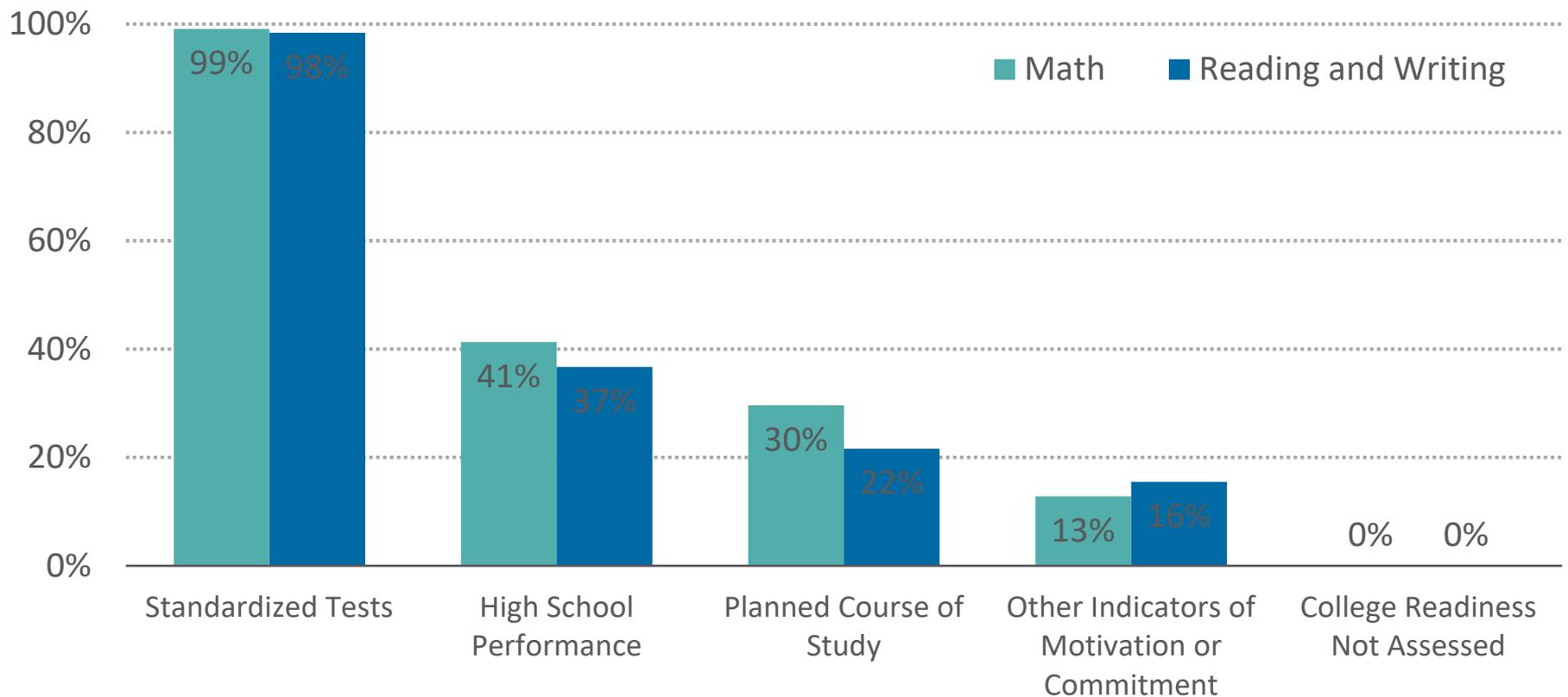
SOURCE: Data from CAPR's institutional survey.
NOTE: Categories are not mutually exclusive.

Students Needing 1+ Developmental Education Course (NCES, 2013)
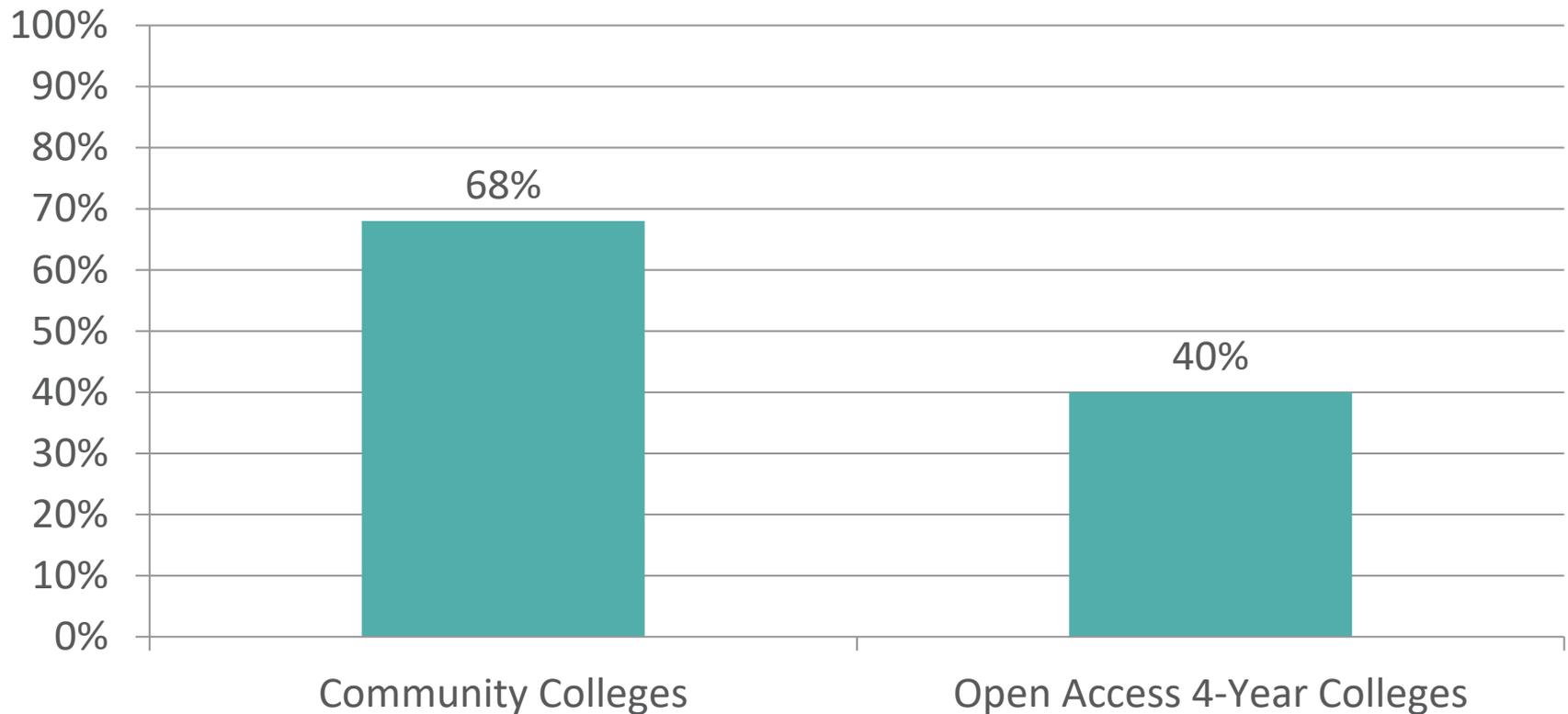
Under-placement and Over-placement

		Placement According to Exam	
		Developmental	**College Level**
Student Ability	**Developmental**	✔	***Over-placed*** **(English – 5%)** **(Math – 6%)**
	College Level	***Under-placed*** **(English – 29%)** **(Math – 18%)**	✔

What measures to consider

- Tests

- HS GPAs

- Both together

- Both plus other data points

SUNY COLLEGE 2: ENGLISH
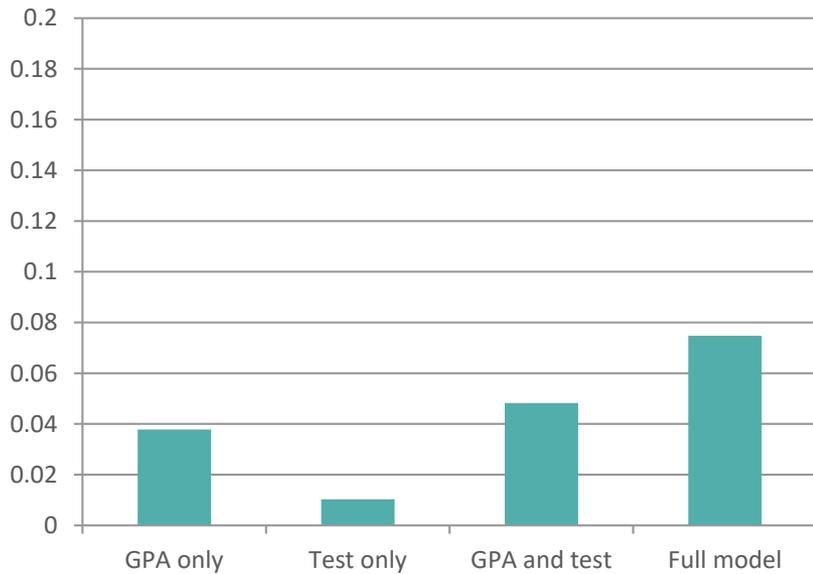
SUNY COLLEGE 2: MATH
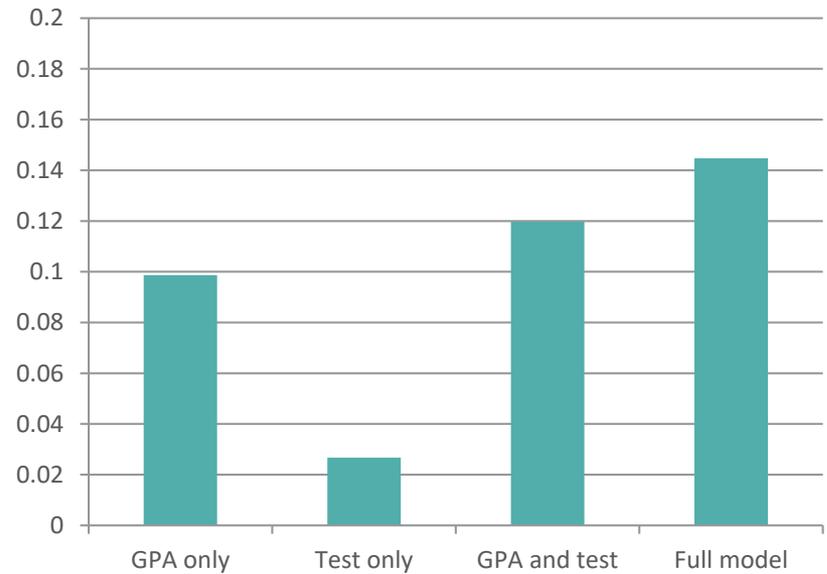
Some things to consider…..

- Better assessment systems are needed.

- Tests don't do a good job.

- HS GPA is the best predictor.

- None of these is a *great* predictor.

Multiple Measures Options

MEASURES	SYSTEMS OR APPROACHES	PLACEMENTS
Administered by college: 1. Traditional or alternative placement tests 2. Non-cognitive assessments 3. *Computer skills or career inventory* 4. *Writing assessments* 5. *Questionnaire items* Obtained from elsewhere: 1. High school GPA 2. Other HS transcript information 3. Standardized test results (e.g., ACT, SAT, AP)	• Waiver system • Decision rules or bands • Placement formula (algorithm) • Directed self-placement	• Placement into traditional courses • Placement into alternative coursework • Placement into support services

Digging in on the HS GPA

(with thanks to John Hetts and Brad Bostian)

- How are we going to get the HS GPA?

- ***Our*** test is different/better/more awesome.

- High school GPA is only predictive for recent graduates.

- Different high schools grade differently.

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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 & Mattern, 2009: "Students are quite accurate in reporting their HSGPA", r = .73.

- ACT research often uses self-reported GPA and generally find it to highly correlate with students' actual GPAs: ACT, 2013: r = .84.

None of the tests are that good for placement.

North Carolina ENGLISH

North Carolina MATH
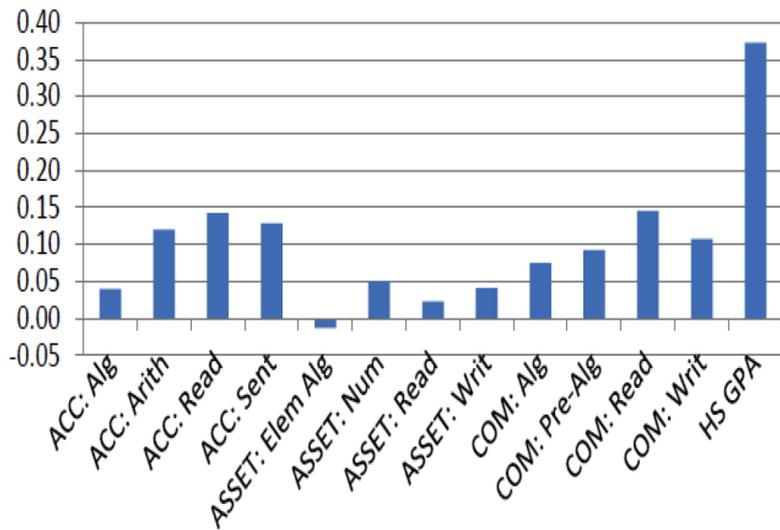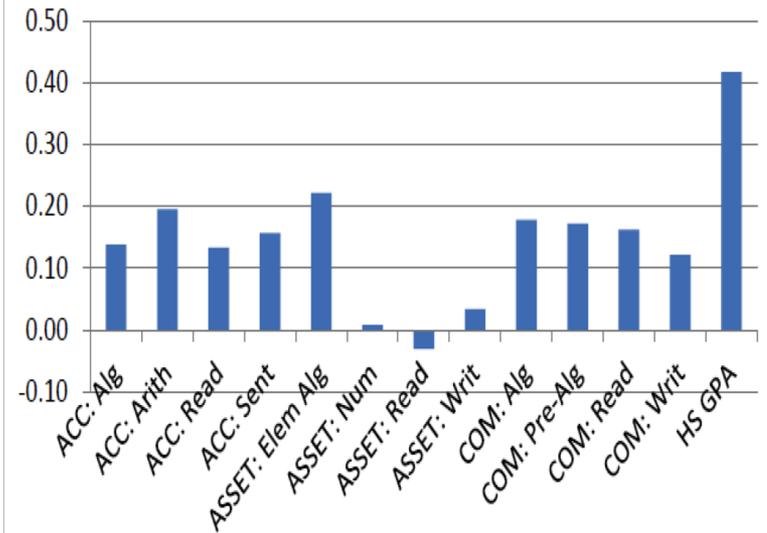
From Bostian (2016), North Carolina Waves GPA Wand, Students Magically College Ready; adapted from research of (Belfield & Crosta, 2012)

HS GPA is a better predictor than test results for a long time (from Hetts, 2016)
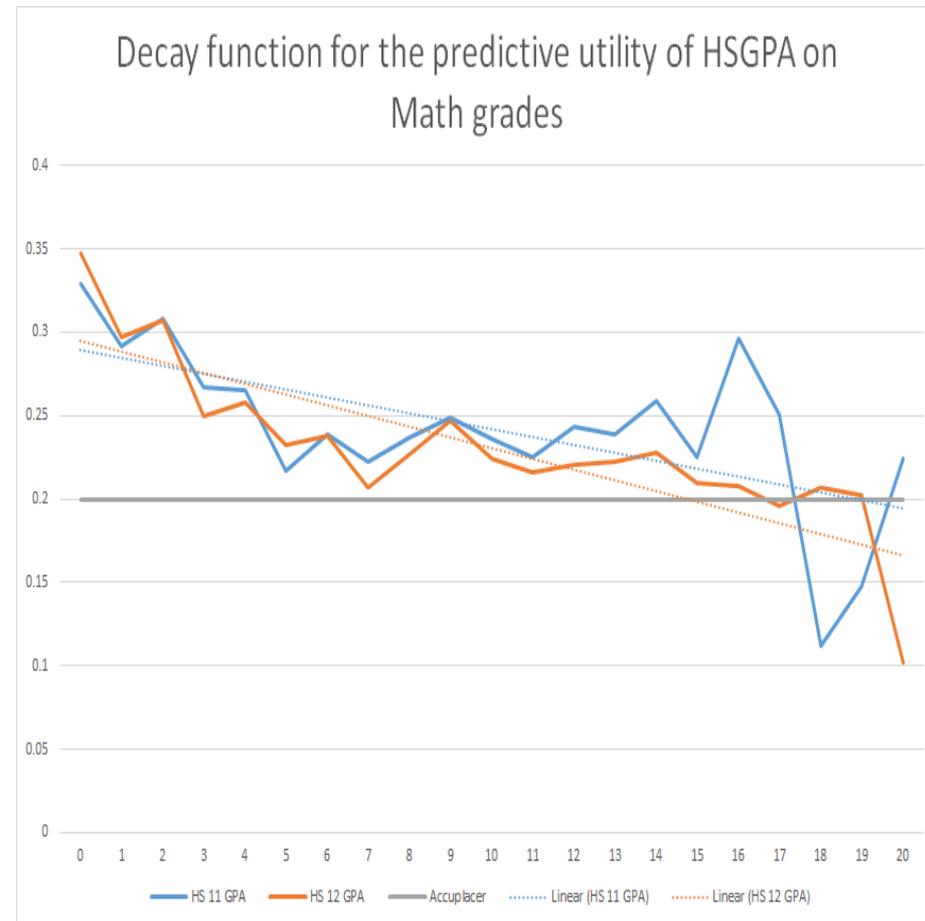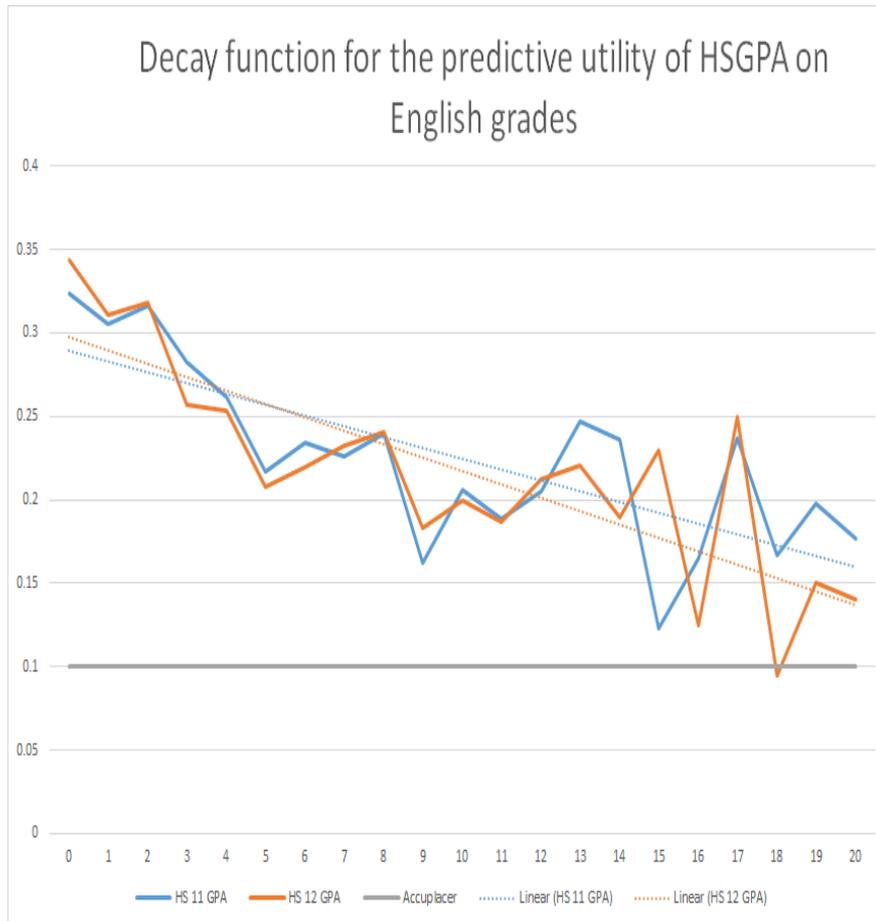
MMAP (in preparation): correlations b/w predictor and success (C or better) in transfer-level course by # of semesters since HS

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
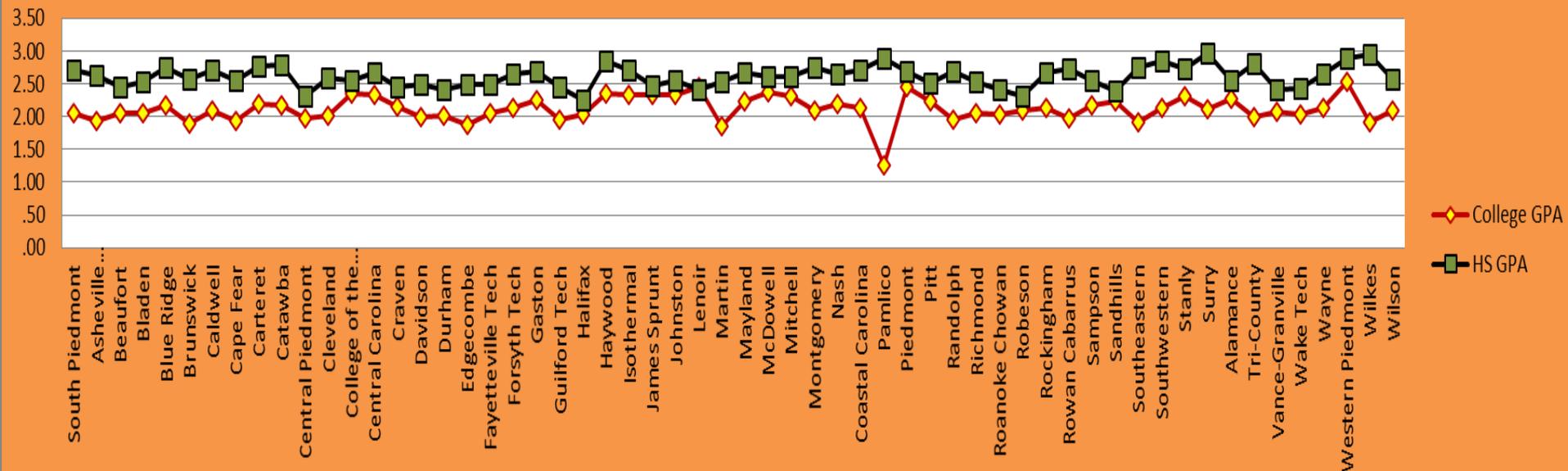
Non-cognitive assessments

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.

Ways to Combine Measures

- Algorithms/predictive analytics

- Decision rules or bands

- Directed self-placement

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Algorithm Example

Decision-Rule Example

College Level Placement

Yes

High

High

Student Applies

Exemptions?

No

HS Record and/or Non-Cog Performance?

Low

Accuplacer Test

Low

Remedial Level Placement

Decision-Band Example

College Level Placement

Yes

Above Band

High

Student Applies

Exemptions? —No→ Accuplacer Test —Decision Band→ HS Record and/or Non-Cog Performance?

Below Band

Low

Remedial Level Placement
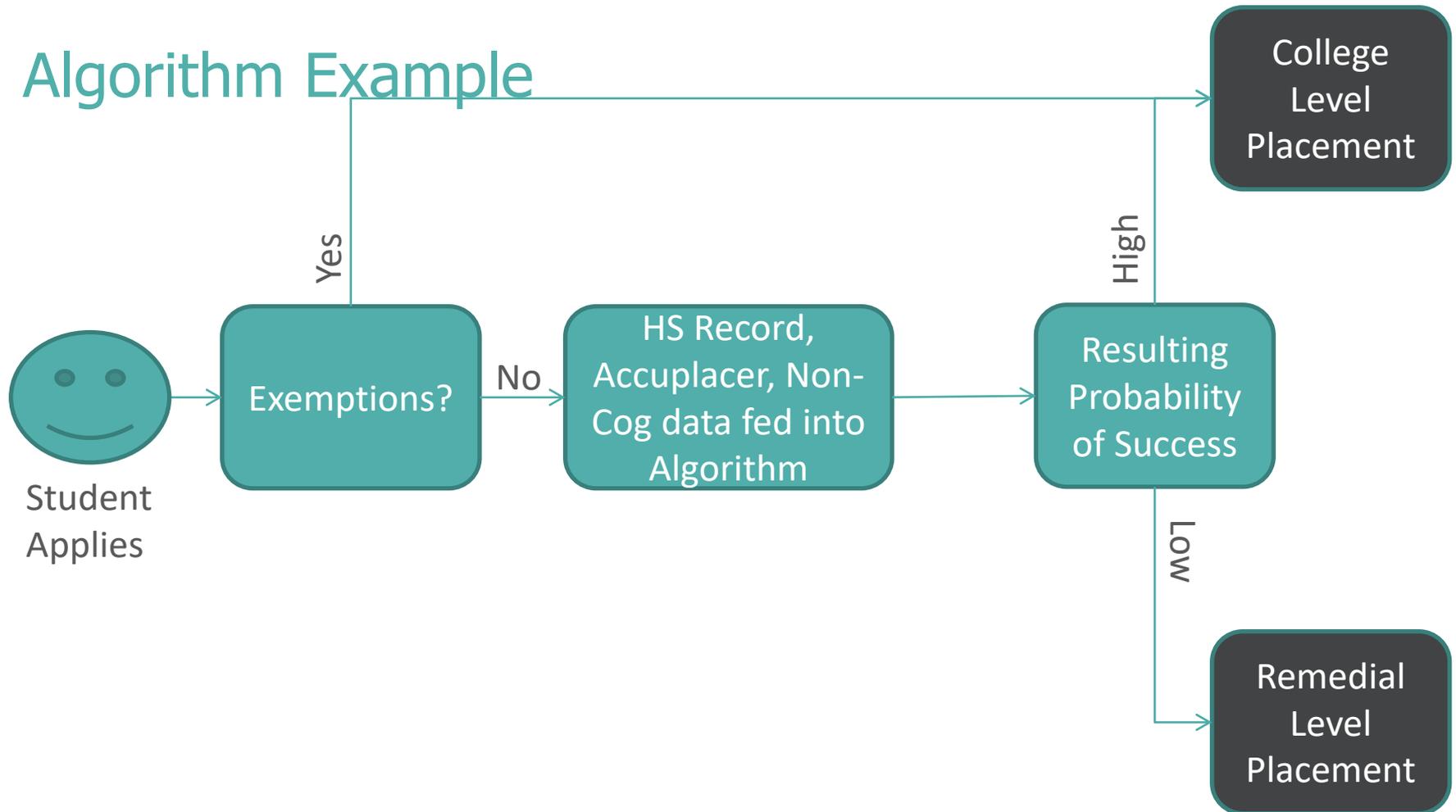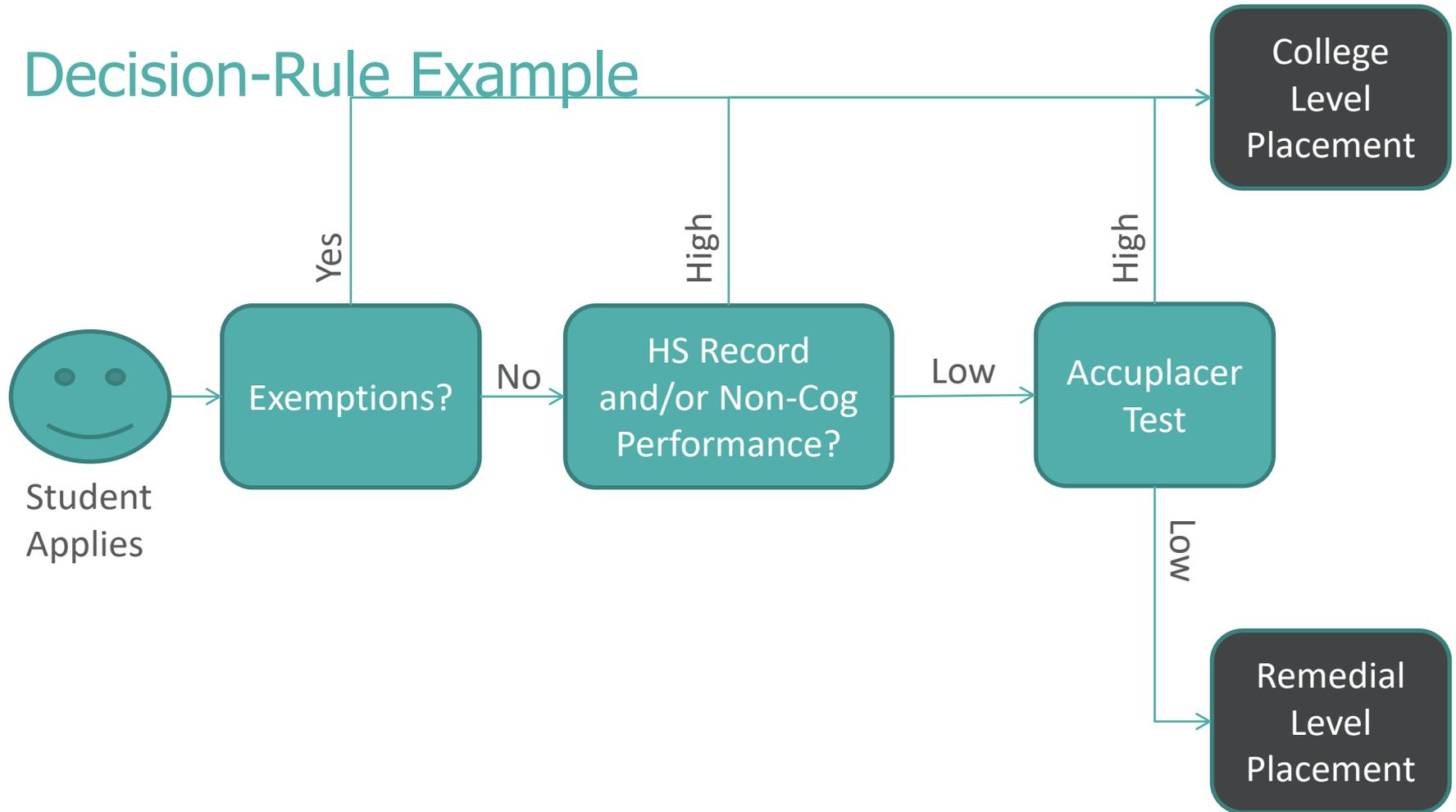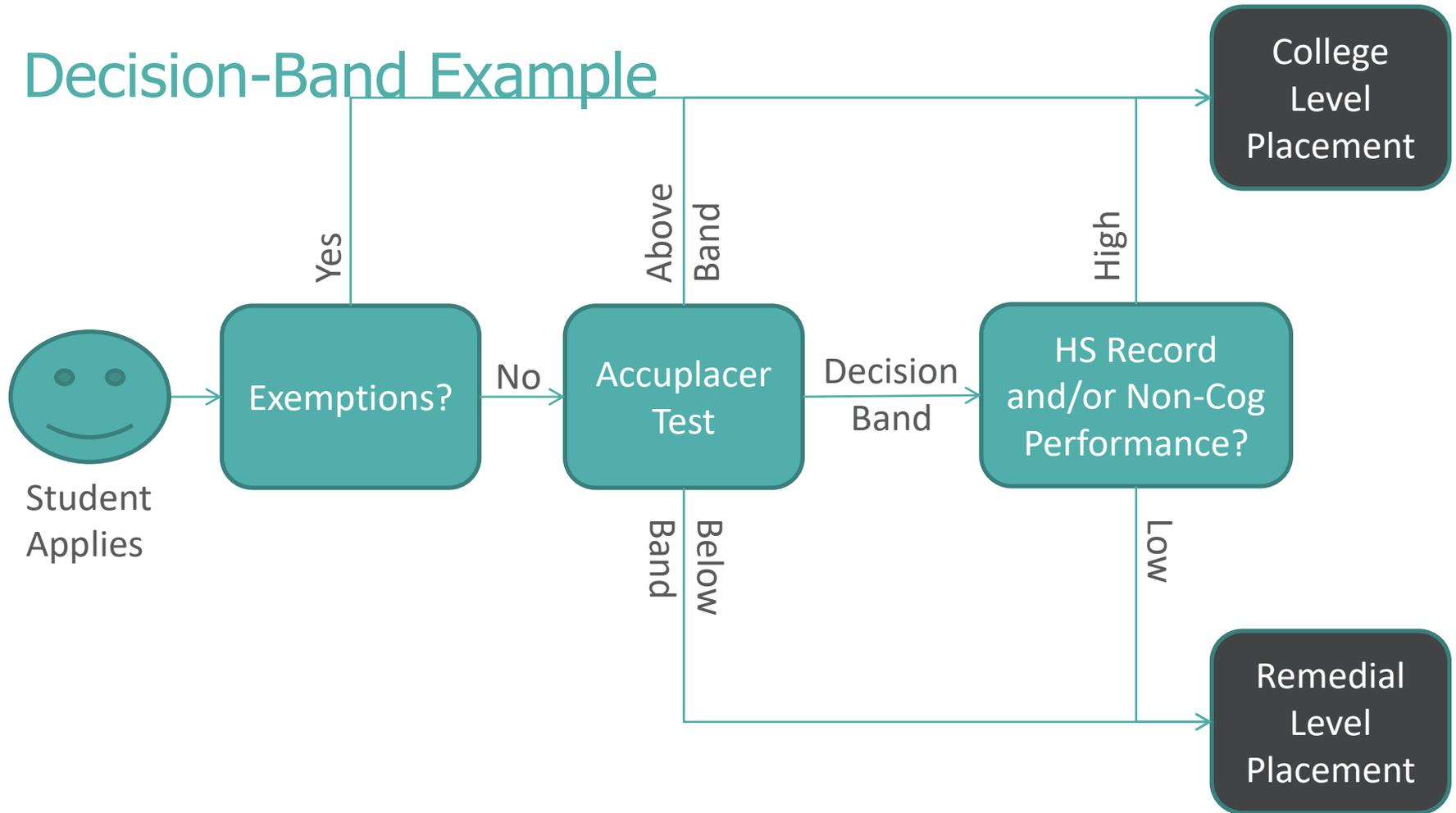
Directed Self Placement in Math (Kosiewicz and Ngo, 2019)

- More students chose to enroll in college- and transfer-level math courses

  – *More female, Black, and Hispanic students enrolled in the lowest levels of math.*

- There was decreased withdrawal from courses.

- More students completed the math required for Associates degree.

  – *Especially White, Asian, and male students.*

Research on a Multiple Measures, Data Analytics Placement System

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

CAPR Assessment Research

1. 7 State University of New York (SUNY) community colleges.

2. Each worked with CAPR team to develop an alternative placement method using an algorithm.

3. Students were randomly assigned to be placed using either the existing placement method or the algorithm.

4. We looked for differences in student outcomes based on placement method.

Creating the algorithm

Use data from *previous* cohorts

Develop formula to predict student performance

Use formula to place *entering* cohort of students
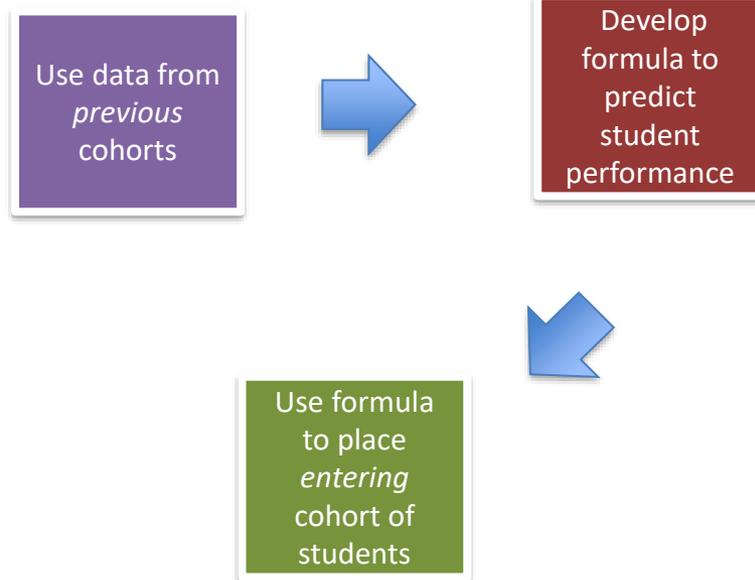
- Historical data from 3 cohorts of students

- Select students who:

  – Took a placement test

  – Took a college-level course first

- Use their outcome in the initial college-level course to gauge how well certain factors predict success (Passing the course with a C or better)

  – HS GPA

  – ACCUPLACER

  – Other HS information (time from graduation, GED, Regents exams, etc.)

- Establish minimum acceptable probability for success in college-level course

Overall Findings

Full Analytic Sample

Final Analysis Sample

Sample = 12,971 first year students across 7 colleges and 3 cohorts

- 51% of students assigned to program group (n=6,589)

- 49% of students assigned to business-as-usual group (n=6,382)

- 86% of students enroll into at least one course in 2016 (n=11,102)

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Differences in Placement among Program Students

Math bar (bottom to top): 10% Lower placement (bumped down), 46% No change (Dev Ed), 28% No change (College-level), 16% Higher placement (bumped up)

English bar (bottom to top): 7% Lower placement (bumped down), 12% No change (Dev Ed), 37% No change (College-level), 44% Higher placement (bumped up)

■ Lower placement (bumped down)   ■ No change (Dev Ed)   ■ No change (College-level)   ■ Higher placement (bumped up)

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Treatment Effects: College-Level English
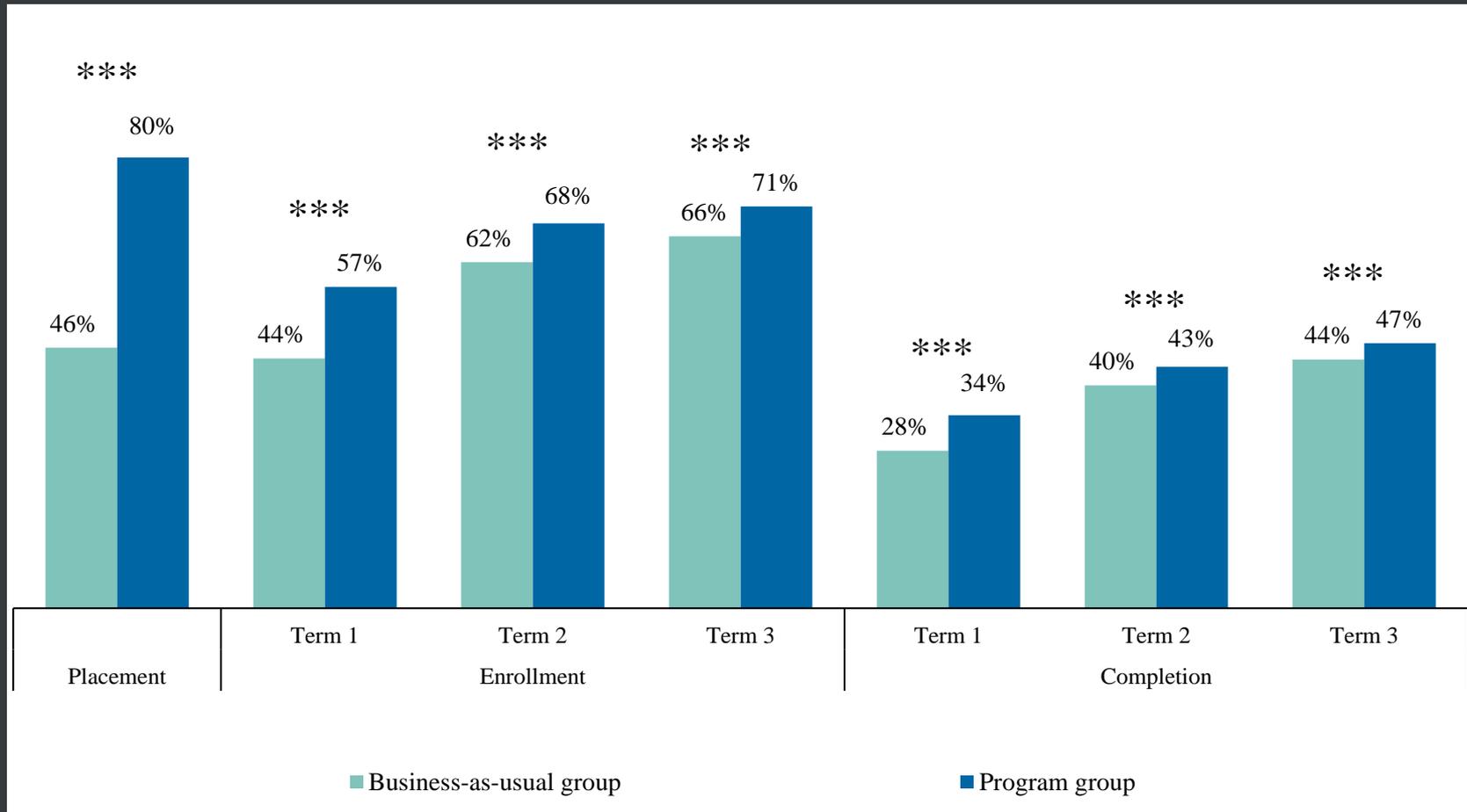
***p < .01, **p < .05, *p < .10.

Treatment Effects: College-Level Math

***p < .01, **p < .05, *p < .10.

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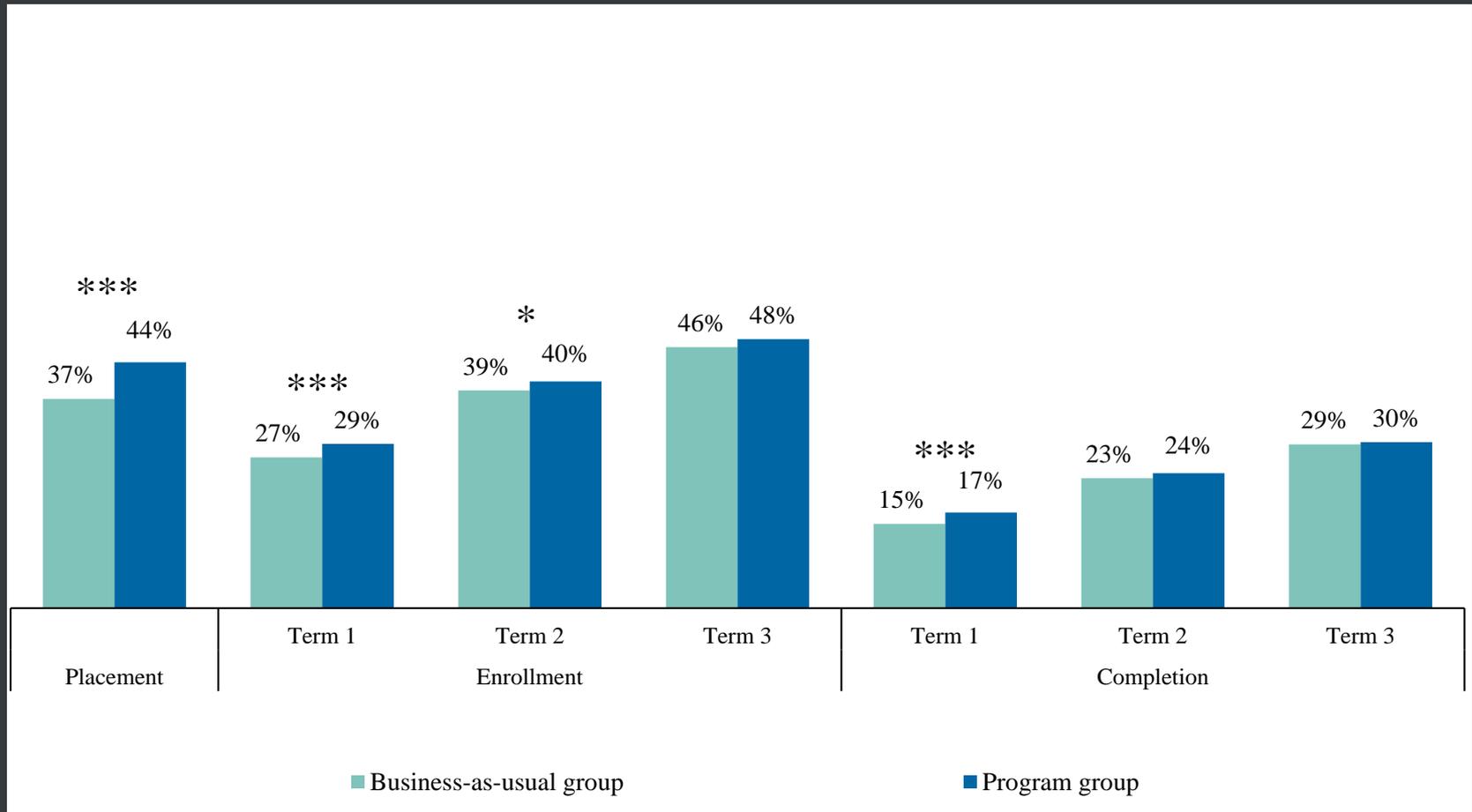
Subgroup Analyses

Full Analytic Sample

Treatment Effects: CL English Placement
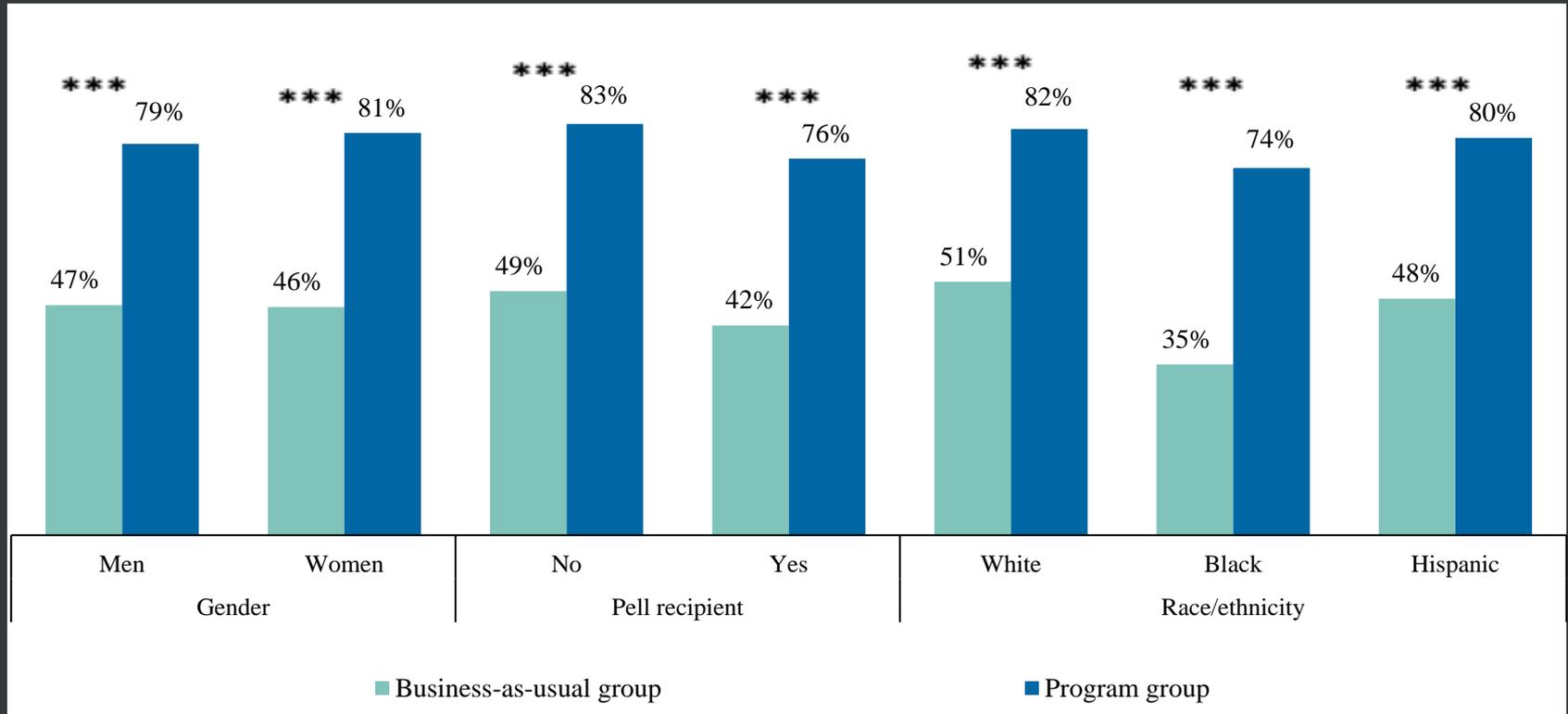
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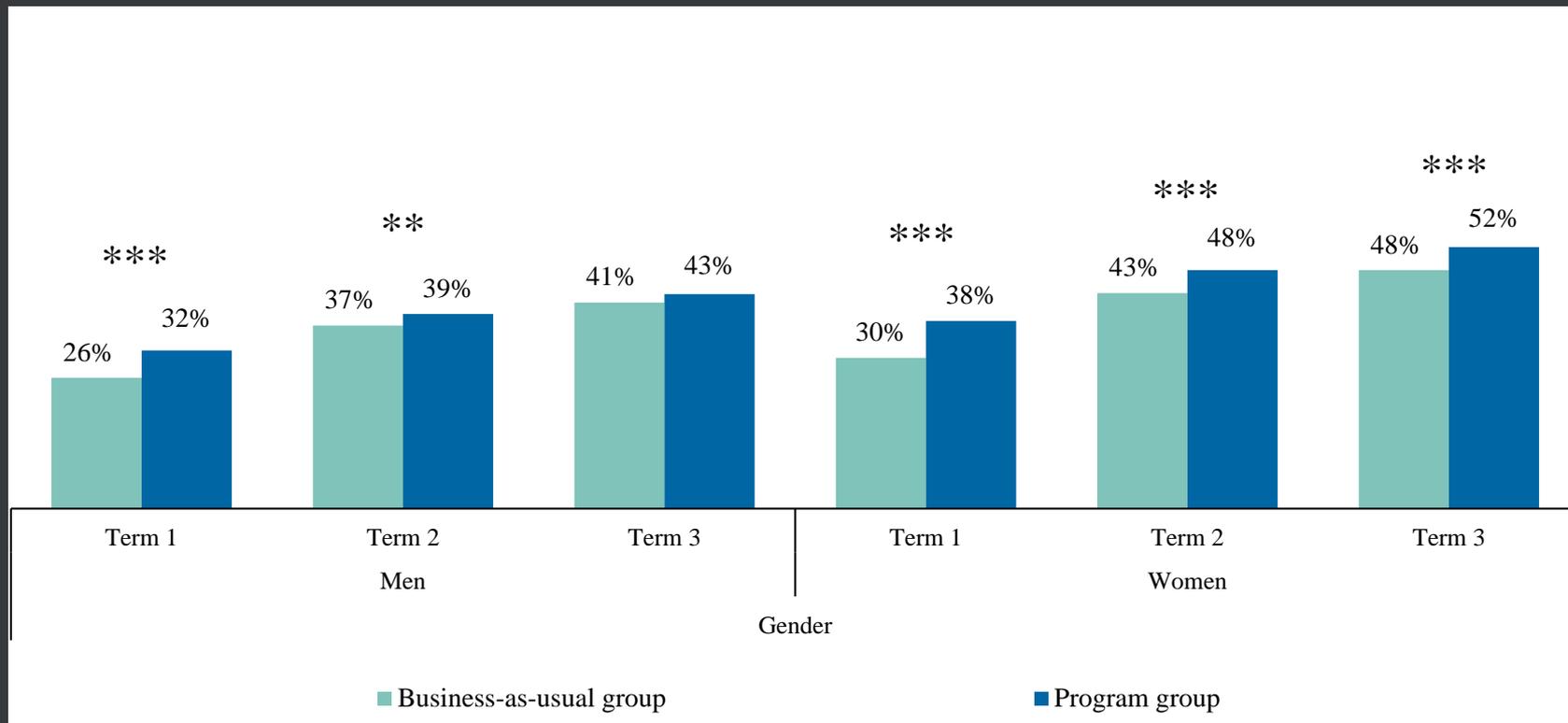
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Treatment Effects: CL English Completion by Gender

***p <. .01, **p < .05, *p < .10

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Treatment Effects: CL English Completion by Pell Status

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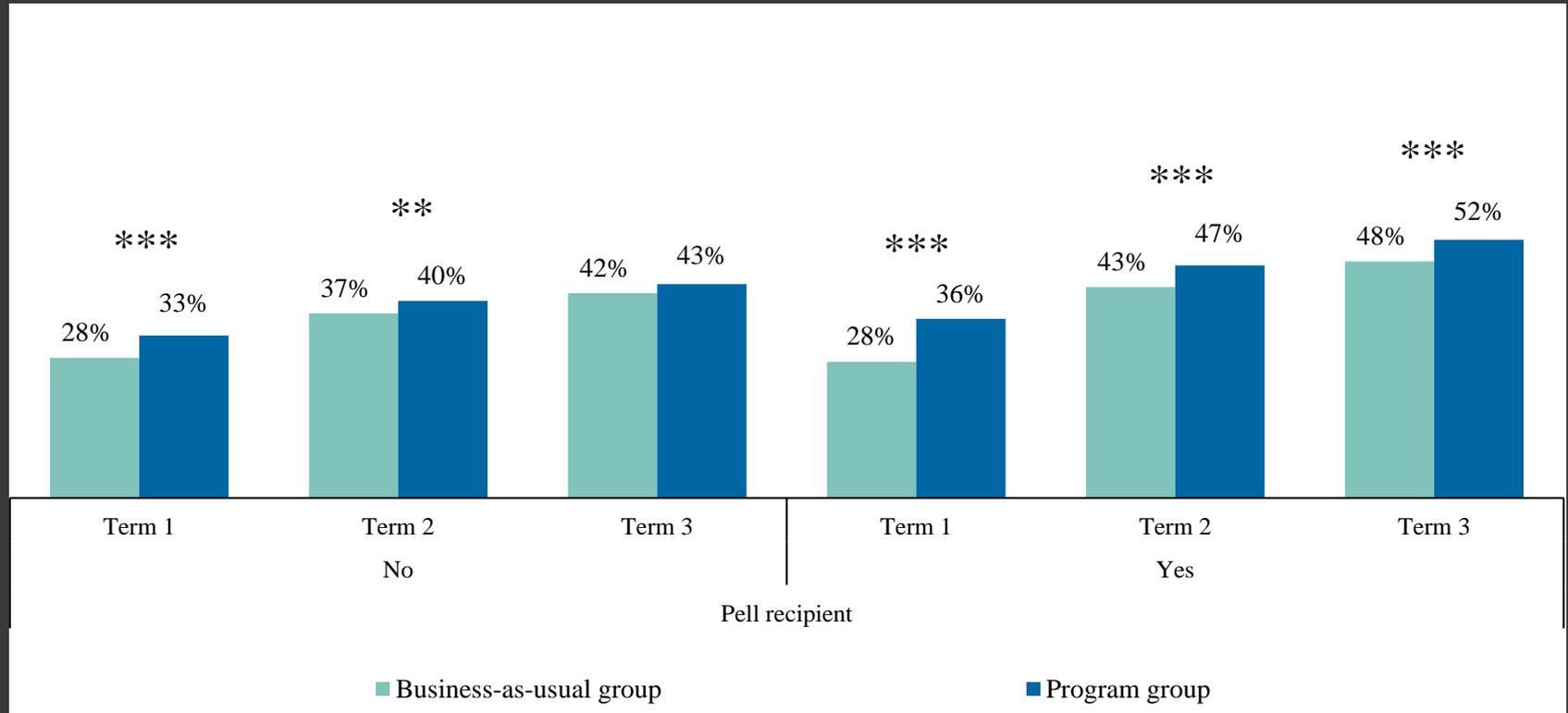
Treatment Effects: CL Eng Completion by Race/Ethnicity
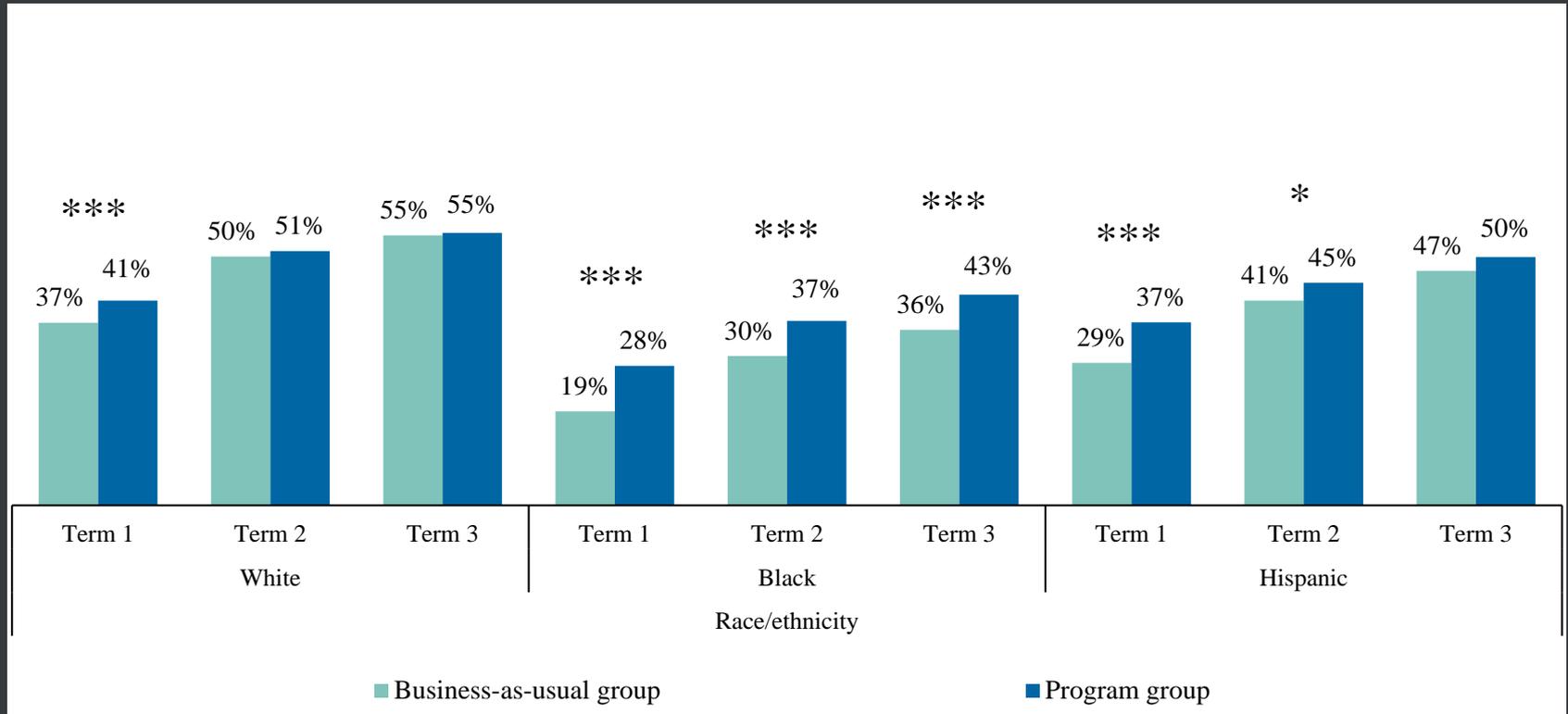
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Treatment Effects: CL Math Placement
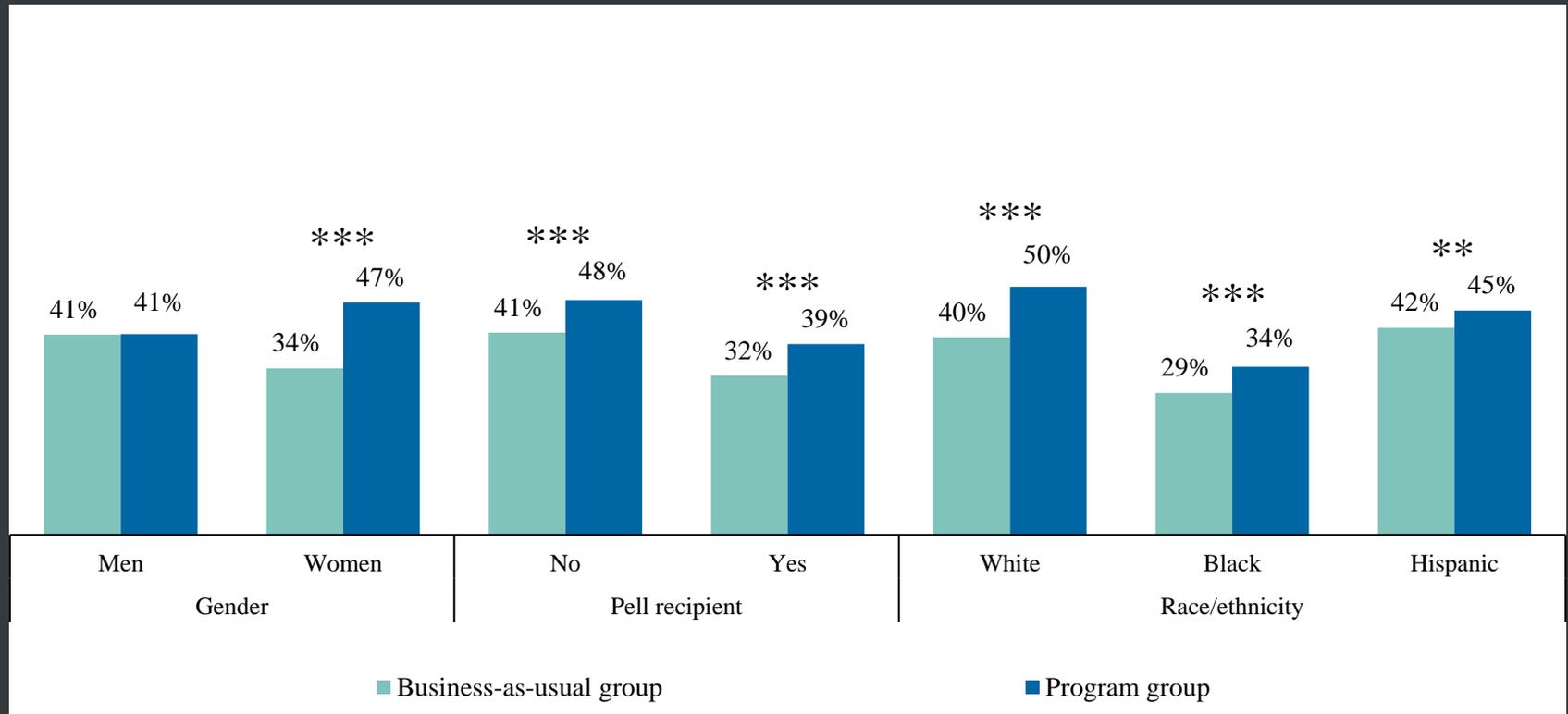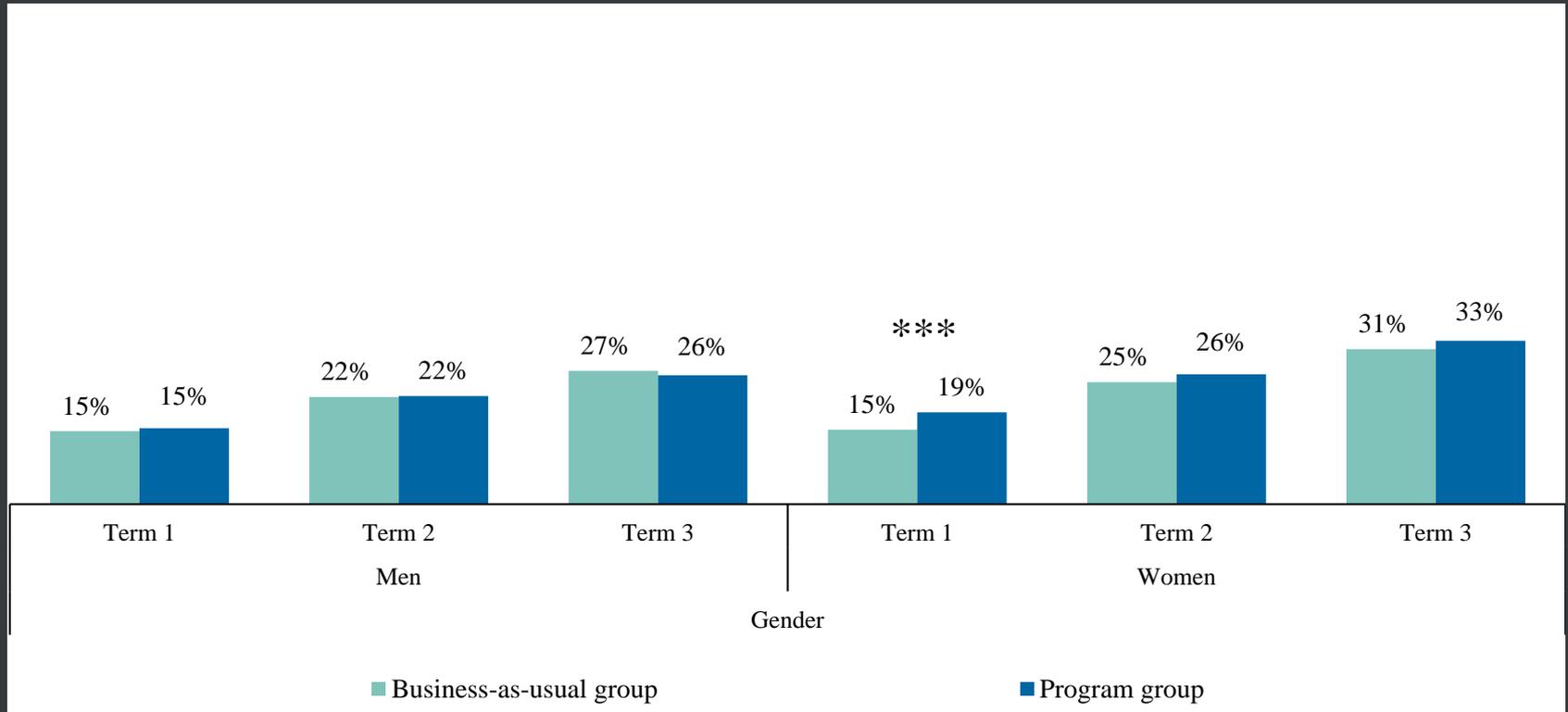
		Men	Women	No	Yes	White	Black	Hispanic
Business-as-usual group		41%	34%	41%	32%	40%	29%	42%
Program group		41%	47%	48%	39%	50%	34%	45%
Significance			***	***	***	***	***	**

Gender — Pell recipient — Race/ethnicity

■ Business-as-usual group   ■ Program group

***p <. .01, **p < .05, *p < .10

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Treatment Effects: CL Math Completion by Gender

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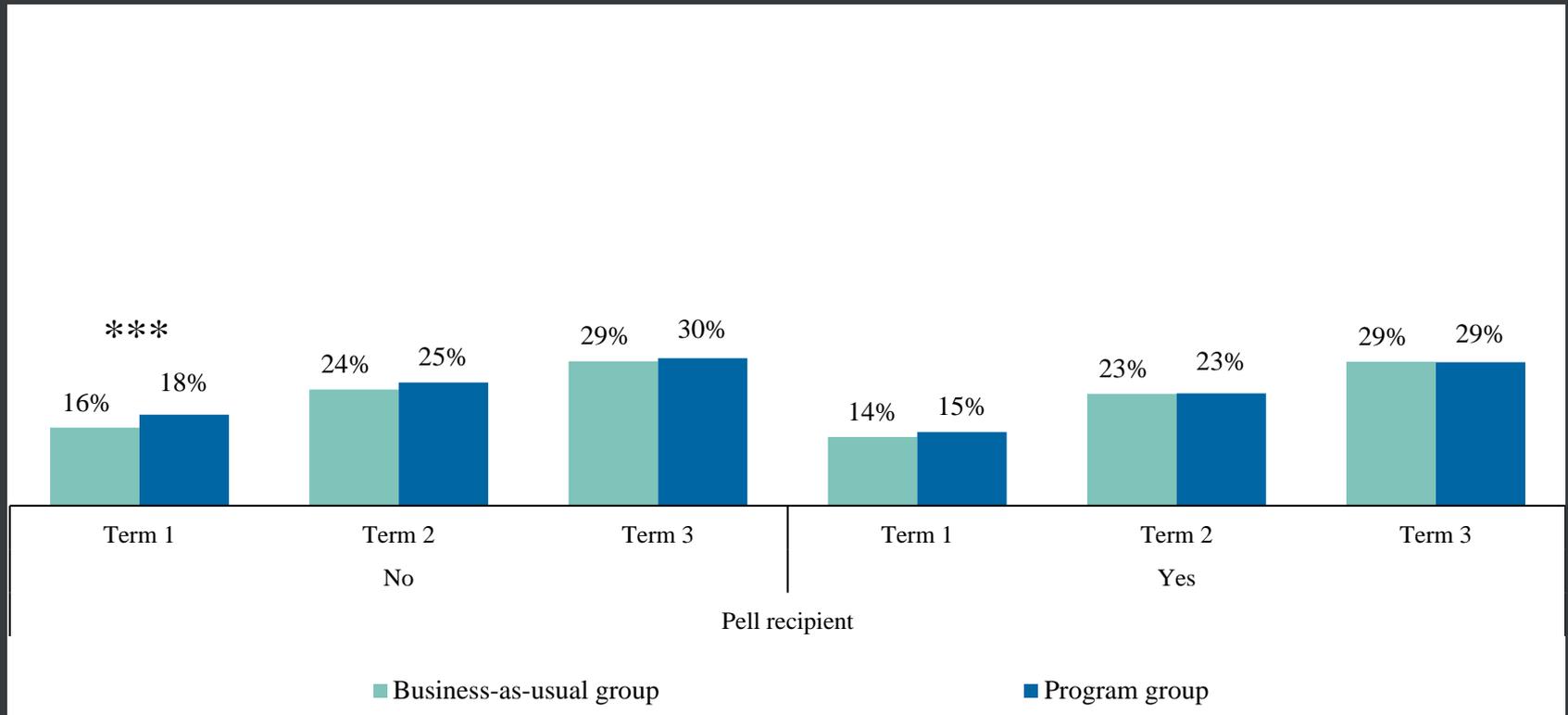
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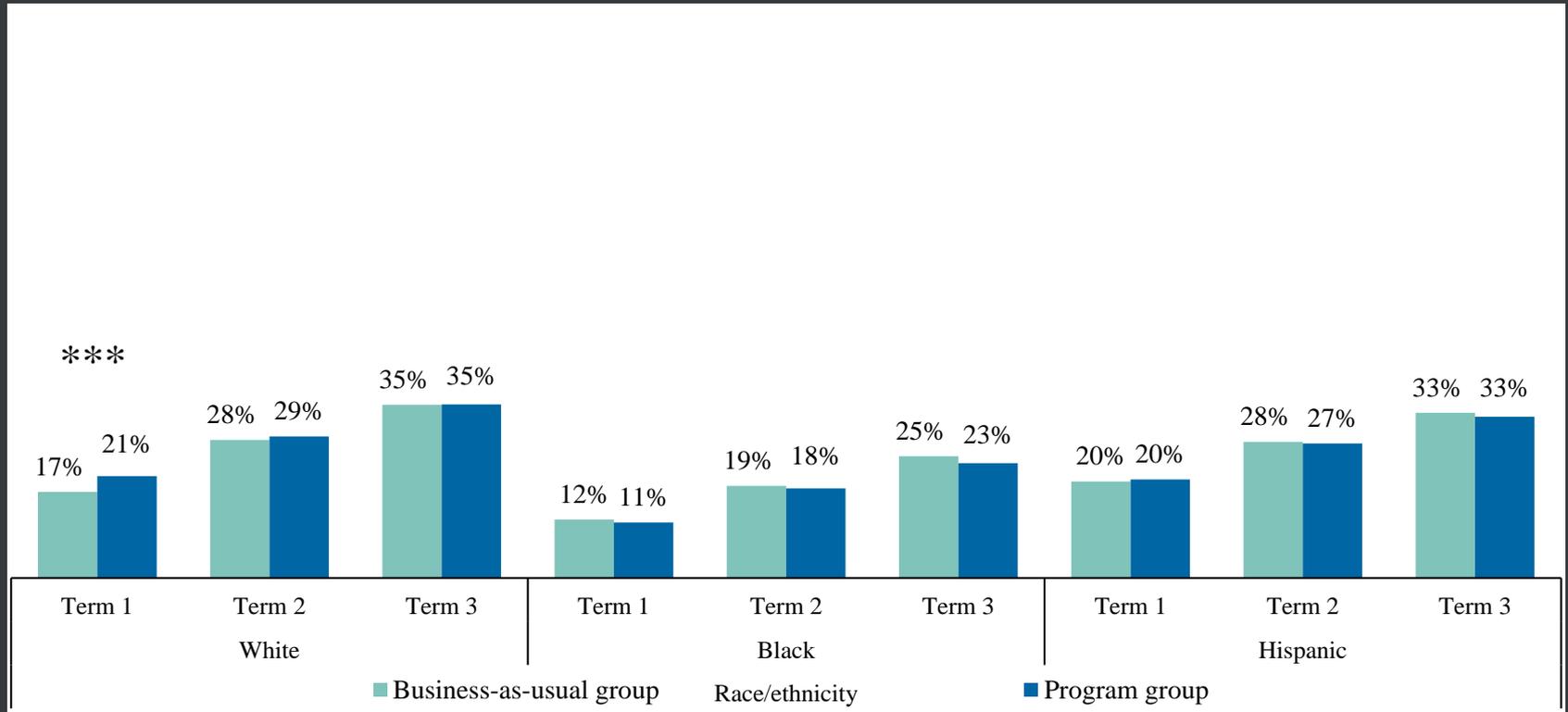
***p <. .01, **p < .05, *p < .10

Summary

Summary of Findings

- Most program group students whose placement changed received a higher placement than they would have received under the status quo system

    - Placement gaps narrowed in favor of women and traditionally underrepresented groups in English

    - Placement gaps between White students and Black and Hispanic students widened in math

- Program group students were more likely to enroll in and complete (with a grade of C or higher) a college-level English course within 3 terms of testing

- Program group students were more likely to enroll in and complete (with a grade of C or higher) a college-level math course within 1 term of testing

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