

Math Pathways and Equity: Using Corequisites in Math

Tammi Marshall

2019 Conference on Acceleration in
Developmental Education



C U Y A M A C A
• C O L L E G E •

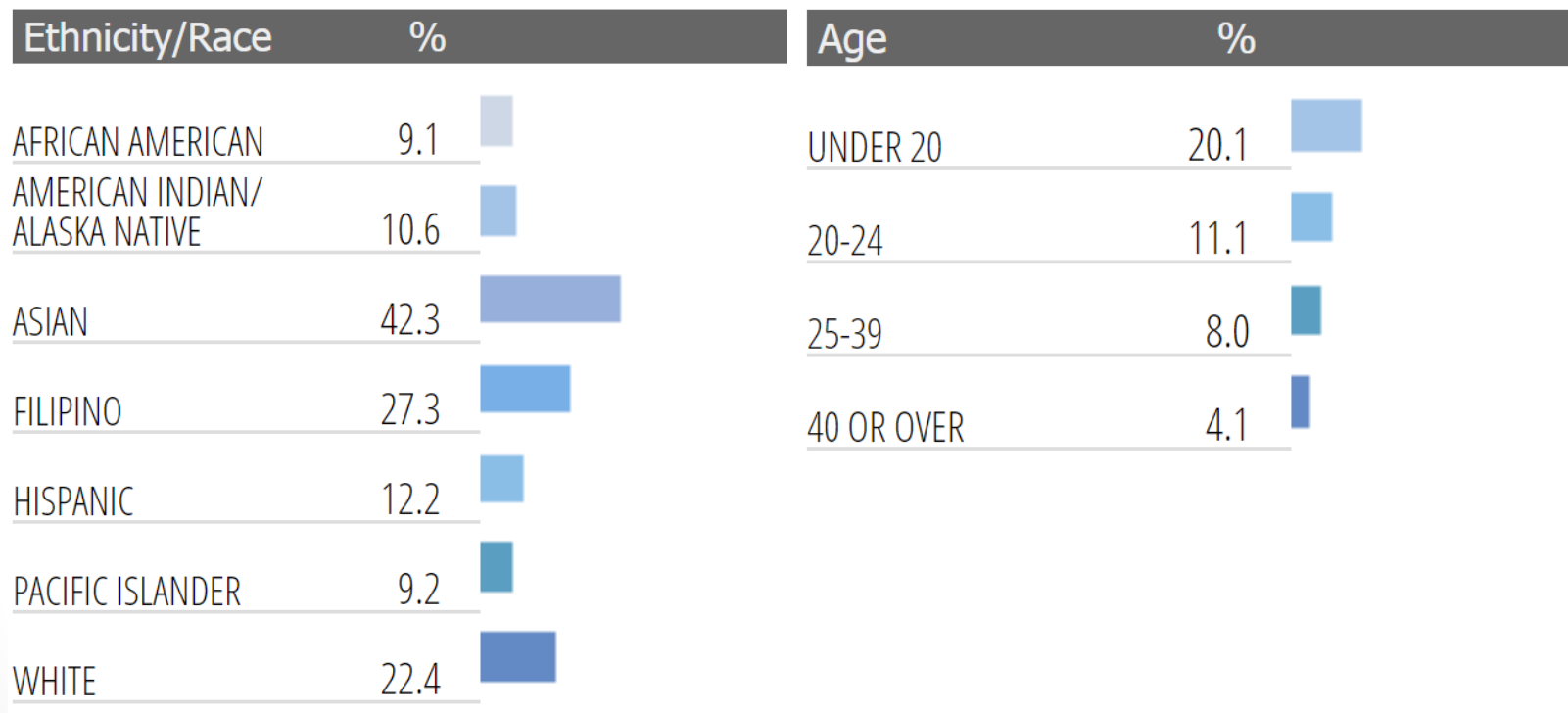
About Cuyamaca College – Fall 2017

- 9,586 student headcount
- 60% of our students are under 25 years old
- 63% have waived or reduced tuition
- 37% first generation
- 33% Latinx
- 8 full-time & 23 part-time MATH faculty
- A multi-campus district (one of two colleges)



The Problem: Structural Bias – CA

Statewide one-year transfer-level math achievement



Source: [2018 CCCC Student Success Scorecard](#)

The percent of first-time students in 2015-16 who complete six units and attempt any Math in their first year who complete a transfer-level course in Math in their first year.

The Problem: Structural Bias – Cuyamaca College

	3-Levels Below	2-Levels Below	1-Level Below
Black	0%	12%	7%
Latinx	9%	20%	34%
Multi-Race	8%	0%	30%
White	11%	17%	36%
Overall	9%	17%	34%

Source: [Basic Skills Cohort Tracker](#)

The percent of students who started math in fall 2014 and completed transfer-level math in two years.

The Choice

1. Accept that students who assess below transfer cannot succeed in a transfer-level math course without multiple layers of decontextualized remediation
2. Recognize that students have the capacity to do college-level work!
 - Provide students with an achievable pathway to attaining their educational goals
 - Some students may need extra support

Math Pathways Goals

- Annihilate equity gaps
- Increase the proportion of incoming students who complete transfer-level math in one year
- Increase the proportion of students who complete their goal (transfer and/or earn a degree or certificate)



High Leverage Strategies

- Change placement policies to allow more incoming students to enroll directly in transfer-level math
- Design and implement concurrent-enrollment support models (a.k.a. corequisite models)

Change Placement Policies

- Fall 2016 – began using students HS GPA & course taking history
- Eliminate all courses 2, 3, 4 levels below transfer
- All students are eligible for Statistics (with or w/o support)
- Intermediate Algebra (1 level below transfer) is for Business & STEM students only
- Fall 2018 – increased access with changes

Change Placement Policies

- Fall 2019
 - NO MORE PLACEMENT TEST!
 - Increased access with additional changes
- Students answer 7 quick questions on WebAdvisor (student portal)
- Students are placed immediately
- Students are placed using a Pathways approach (Q7)

Step Two - Assessment/Placement Questionnaire

Please answer the following questions. Once you have submitted your answers, your placement score will be calculated and you will not be permitted to respond again.

* = Required

You have previously submitted this questionnaire and cannot re-submit it. Please contact the Assessment Center at (619) 644-7200 (Grossmont College) or (619) 660-4426 (Cuyamaca College) for assistance.

* 1. Did you attend a U.S. high school for three or more years?

Yes

* 2. Which of the following is the closest approximation to your overall **UN-WEIGHTED** grade point average (GPA) in high school?

3.3 or higher

* 3. Is English your native or primary language?

Yes

* 4. Do you sometimes have trouble reading and writing in English because English is not your native or primary language?

No

* 5. Of the courses in this selection, which is the **HIGHEST** you have completed or are currently passing with a C or better?

Calculus

* 6. What is/was your grade in that course?

A

* 7. In which of the following areas are you thinking of majoring (studying)?

Engineering/Math/Computer Science/Science (Physics, Chemistry, Biology, Pre-Med, etc.)

SUBMIT

Assessment/Placement Results

Recommended courses:

Submitted: 28 Feb 2019

Recommended Math: Math 180

Recommended English: Engl 120

Please see a counselor if you have any questions about your placement results, or if you change your major which might change your Recommended Math.

OK

Cuyamaca College Model

- First-tier transfer-level courses have corequisite support
 - PreCalculus, Applied Calculus, Statistics, Quantitative Reasoning
- Cohorted model
 - Same instructor with back-to-back scheduling
 - Contextualized remedial support
 - Just-in-time remediation
 - Attention to the affective domain

Paradigm Shifts in Teaching & Learning

- The activity-based math classroom
- Intentional support for the affective domain
- Change expectations: students, teachers, staff, and administrators
- Professional Development
- Culturally responsive teaching and learning

The Players

- Instruction
- Administration
- Student Services (Counseling/Assessment)
- Students
- Institutional Research
- Institutional Technology
- Successful implementation requires ALL players to participate

Challenges and Considerations

- Technology
- Multi-college district
- Old beliefs vs. new perspectives
- Professional Development (SS and Instruction)
- Appropriate placement (driven by intent)
 - Consideration for the “undecided” students
 - Confusion of giving students too many options
- If you offer it, they will come

Benefits

- Students believe in themselves and achieve their goals
- If you offer it, they will come
- Streamlined math from high school to college
- The “two-year” ed plan is real
- AB 705 ready (CA)

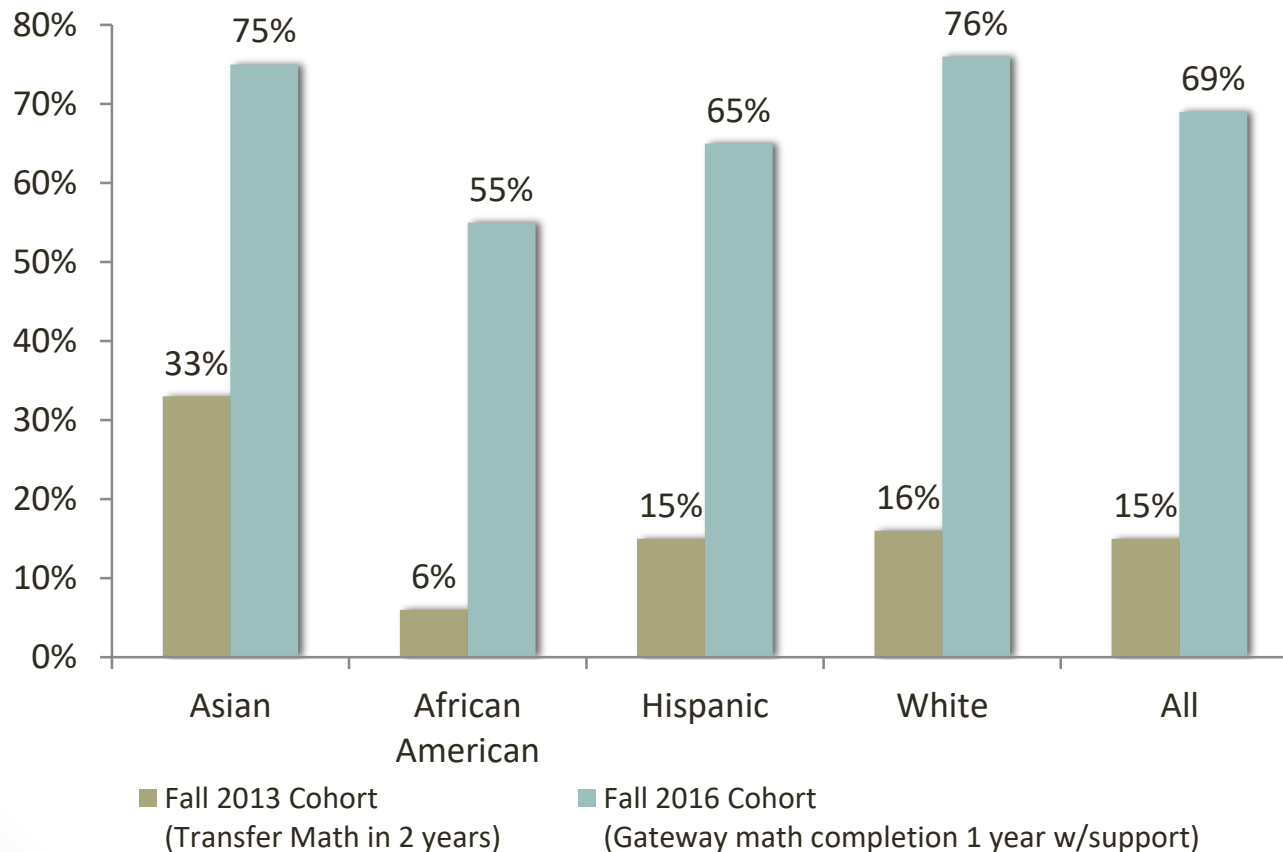
Schedule Changes

	Number of Course Sections		
Course Level	Fall 2015	Fall 2016	Fall 2019
2+ levels below	18	NA	NA
Intermediate Algebra	15	19 (10 w/support)	5 (1 w/support)
PreStatistics	3	3	0
Statistics	11	22 (10 w/support)	24* (9 w/support)
Transfer-Level (no Statistics)	18	25 (3 w/support)	29 (3 w/support)

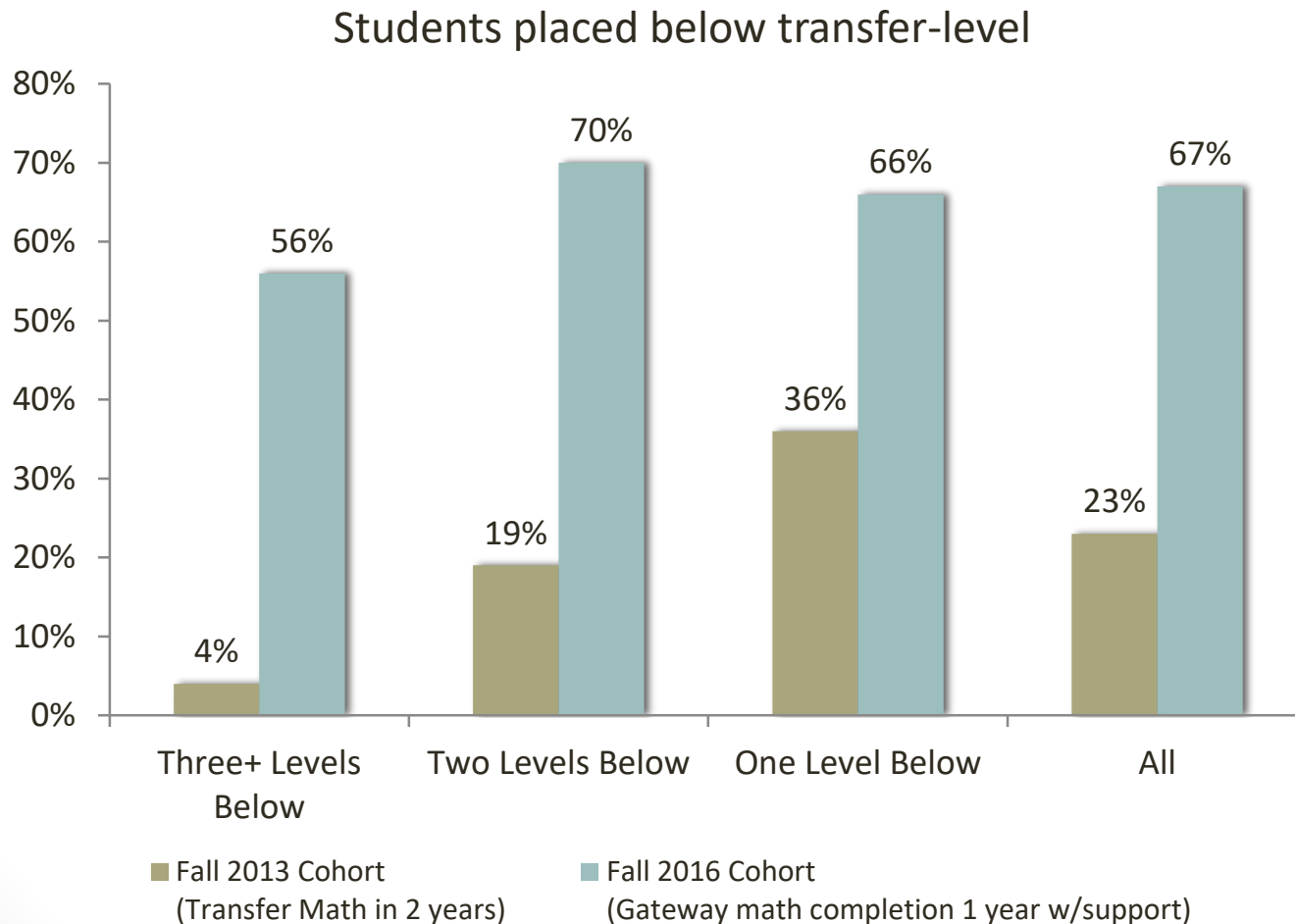
*Two sections are Psych Stats (one with support)

Throughput at Cuyamaca: Before and After Structural Changes

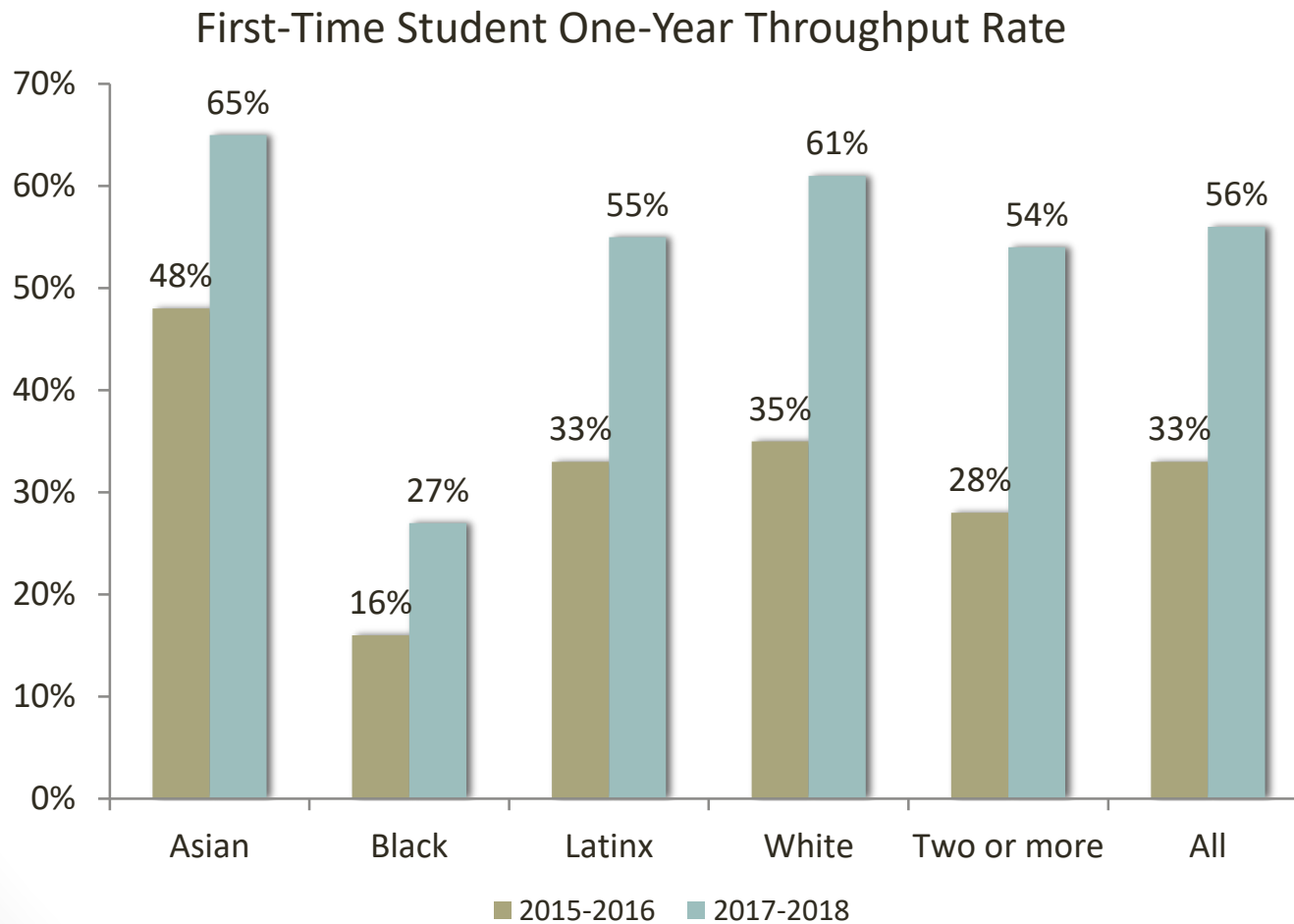
Students placed below transfer-level



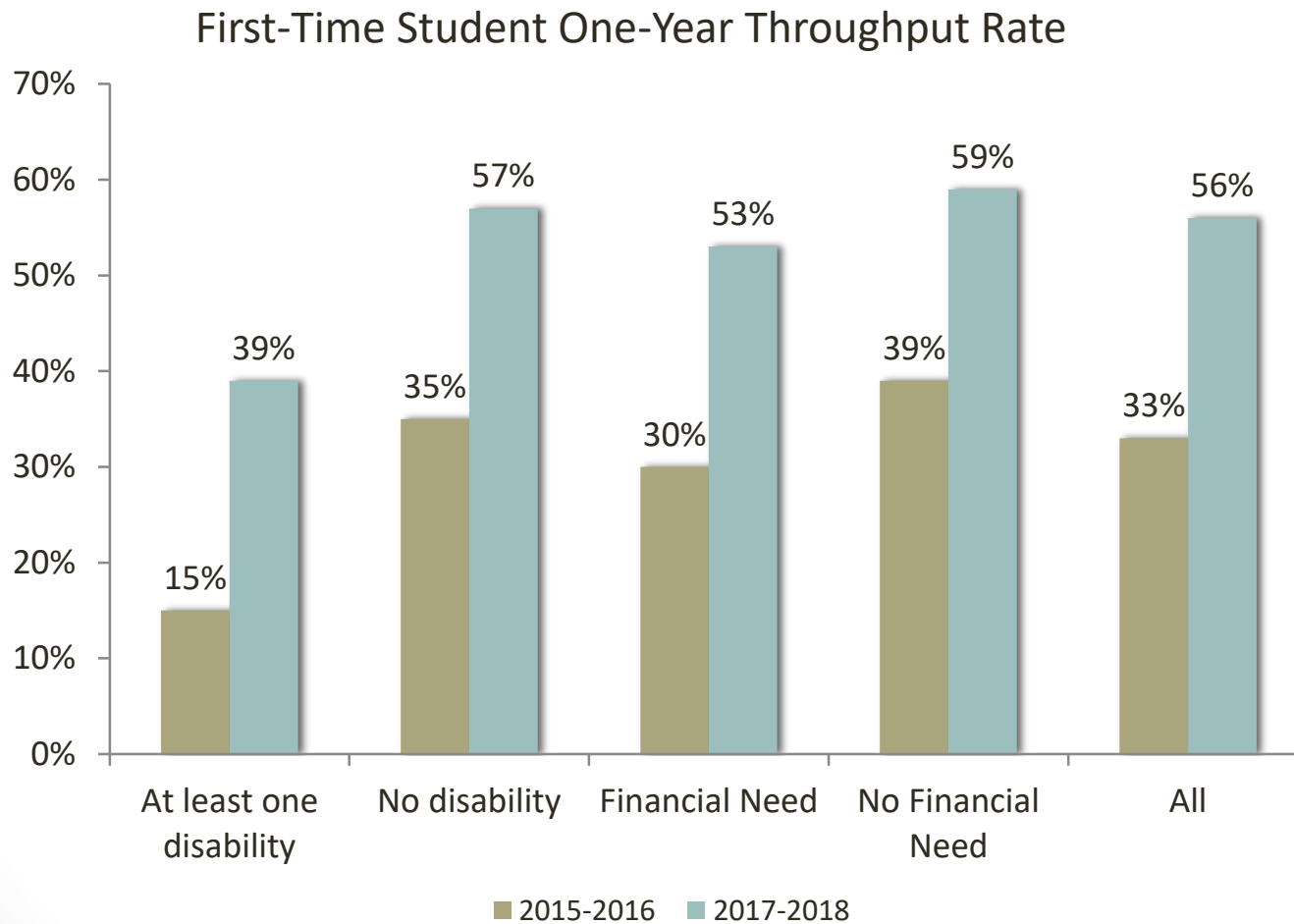
Throughput at Cuyamaca: Before and After Structural Changes



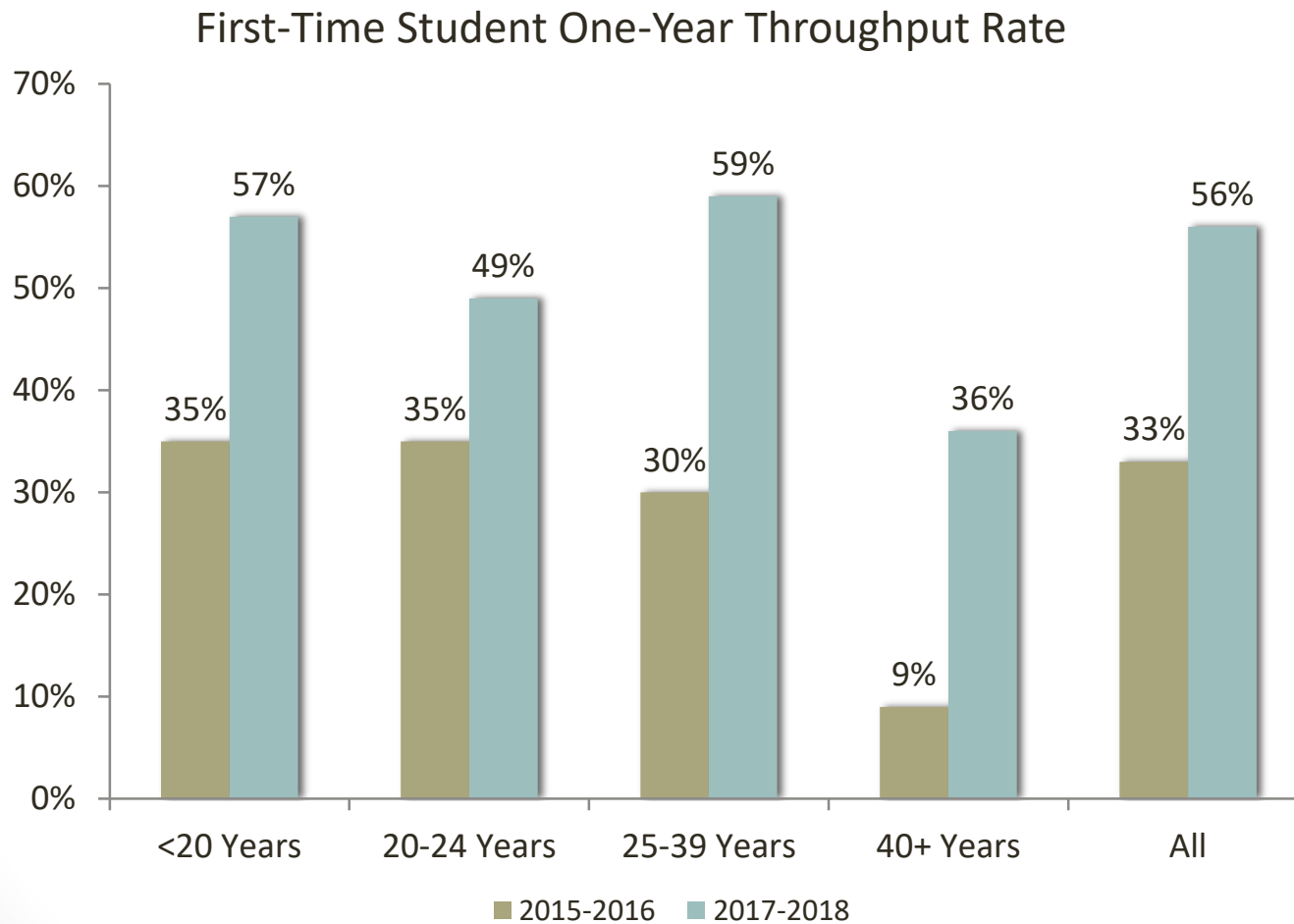
Throughput at Cuyamaca: Before and After Structural Changes



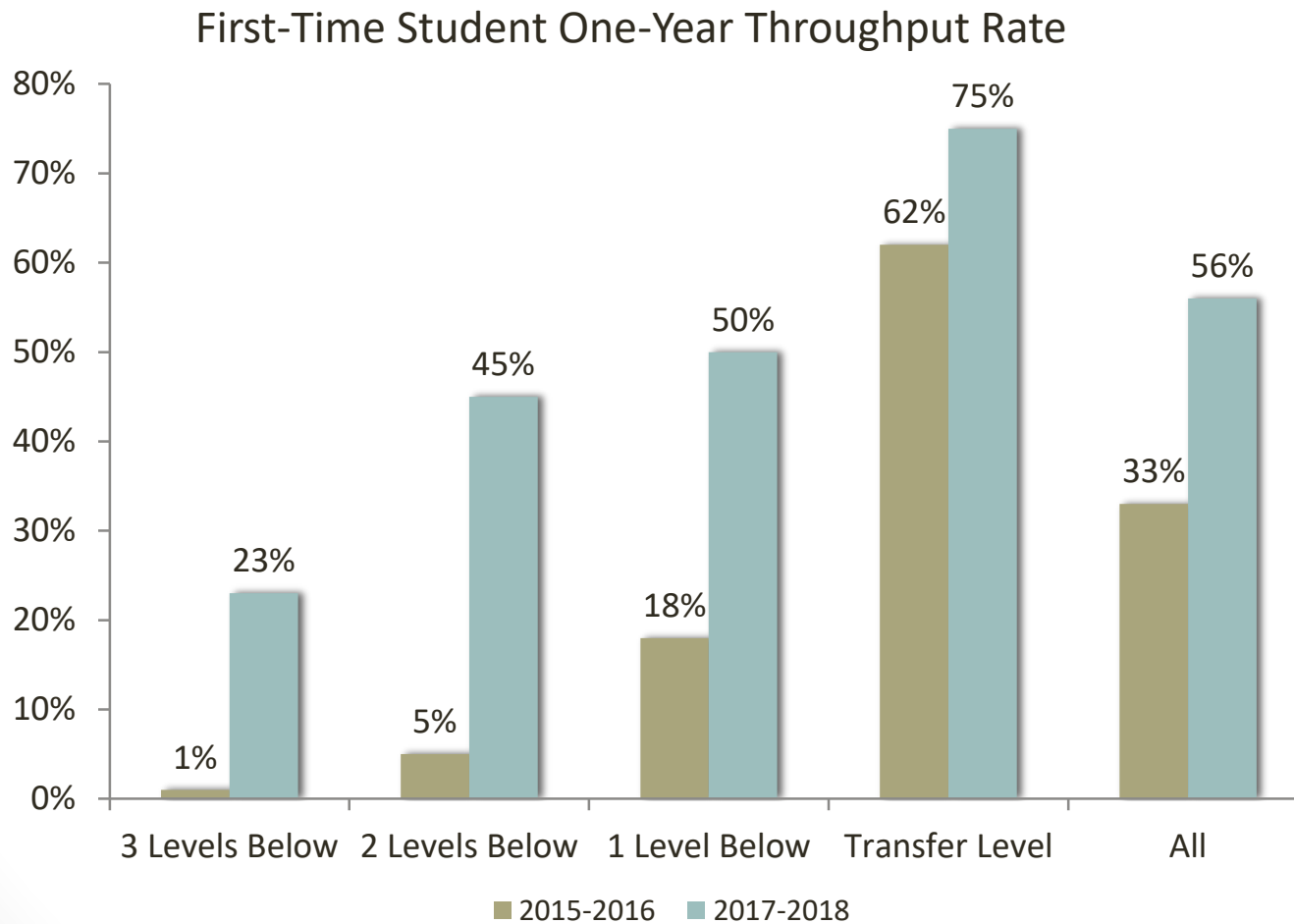
Throughput at Cuyamaca: Before and After Structural Changes



Throughput at Cuyamaca: Before and After Structural Changes

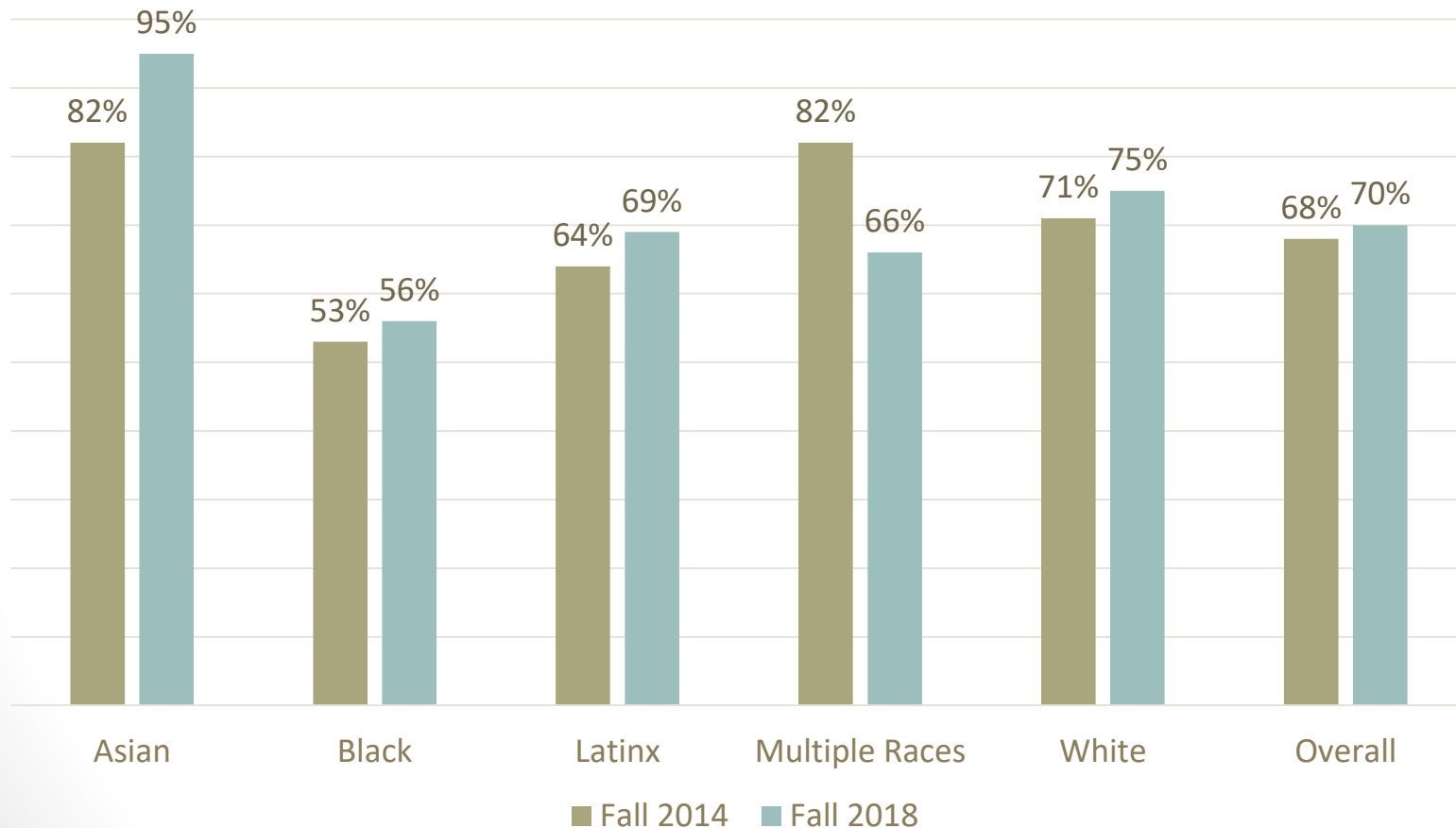


Throughput at Cuyamaca: Before and After Structural Changes



Statistics Success (Before & After)

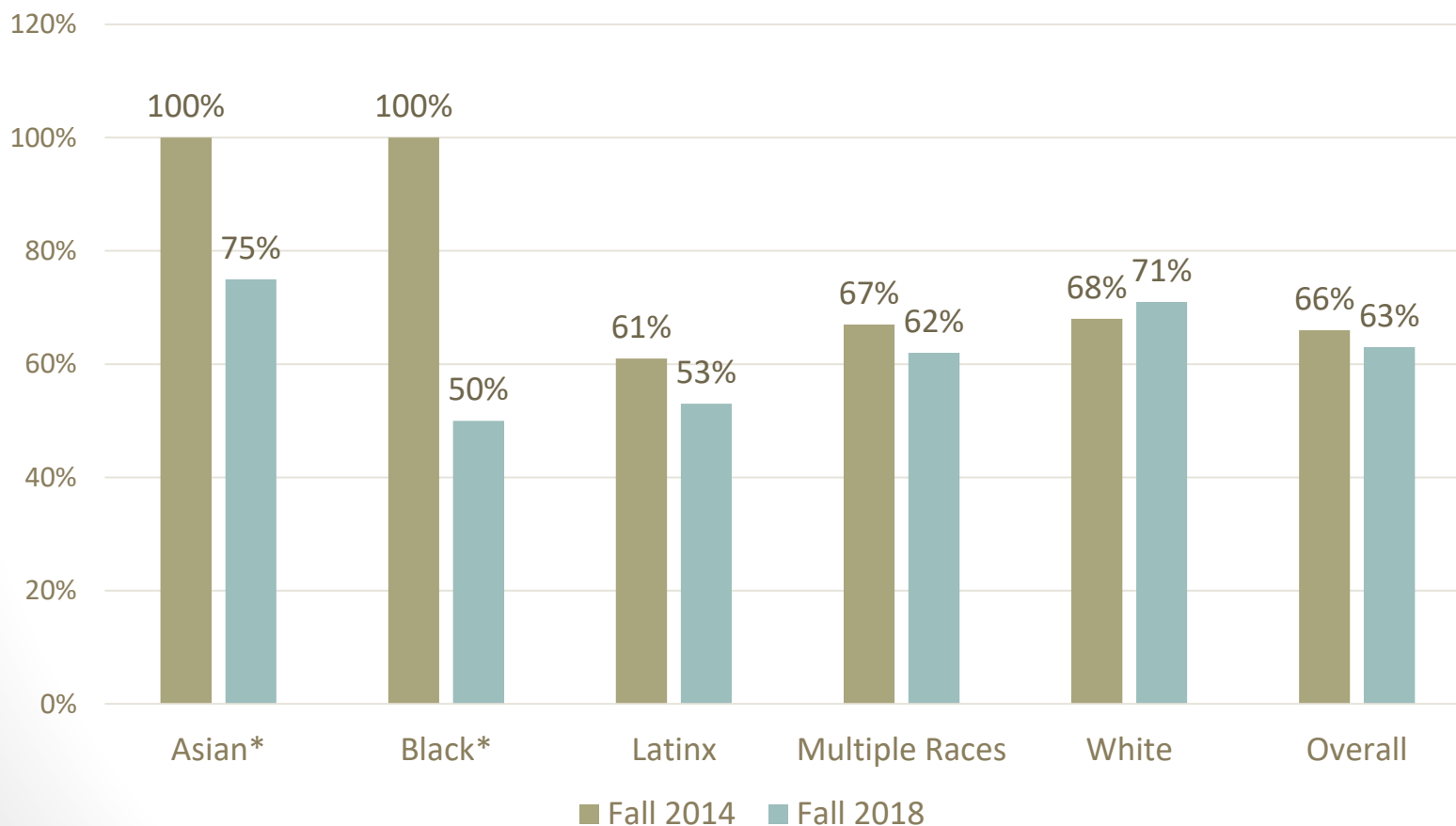
Overall Success Rates



*Sample Space very small

PreCalculus Success (Before & After)

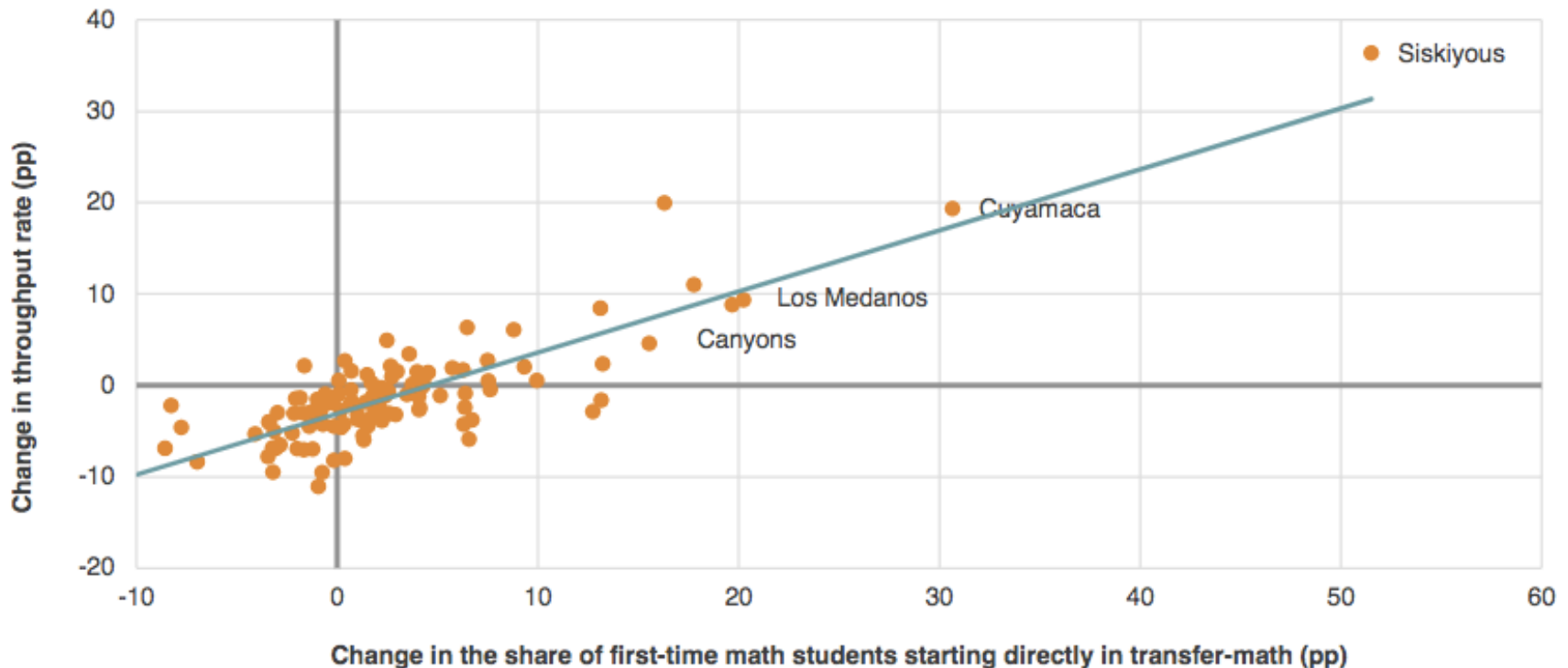
Overall Success Rates



*Sample Space very small

Highlights of PPIC Study

Increased access to transfer-level math correlates with higher transfer-level math completion in one year



Source: [Remedial Education Reforms at California Community Colleges: Early Evidence on Placement and Curricular Reforms \(Rodriguez, Cuellar Mejia, and Johnson, 2018\)](#)

Highlights of PPIC Study

At “early implementer” colleges, transfer-level math completion for low-income students and students of color is substantially higher than the statewide average

Average one-year math throughput for early implementers vs. statewide average:

- Low-income: 49% vs. 23%
- Latinx: 48% vs. 19%
- African American: 46% vs. 13%

Placement – Fall 2019

	Total	Percentage
Intermediate Algebra	107	9.7%
SLAM	525	47.7%
SLAM plus support	93	8.5%
BSTEM	187	17.0%
BSTEM plus support	86	7.8%
Calculus	102	9.3%
Total	1100	100%

Note: Unknown/other race/ethnicity excluded from chart

Caleb Rendon-Guerrero



Background: High school dropout who had been in and out of criminal justice system

Goal: To “be the solution not the problem” in his family, create a non-profit to help kids like him

Placement via Standardized Test:
Elementary Algebra

Probability of completing transfer-level math: 19%

Corequisite Remediation:
Enrolled in College Statistics with two units of concurrent support

Grade in Statistics: B

Completed Business Calculus w/support

Follow Up: Third student, transferring to SDSU fall 2019

Karly Franz



Background: Returning adult student, away from math for five years; studied fashion design, worked as a historical costumer

Goal: Teach high school biology

Placement via Standardized Test: Intermediate Algebra

Probability of completing transfer-level math: 36%

Given access to transfer-level: Enrolled directly in Pre-Calculus with two units of concurrent support

Grade in Pre-Calculus: 89

Subsequent grade in Calculus: A (instructor said she was one of the best students in class)

Mariam Shamon

Background: Student straight from HS who had very bad math experiences; Political Science major

Placement: Statistics

Enrollment: Statistics with support

Changed Beliefs: Growth Mindset

Grade: A

Changes: Decided she wanted to try Pre-Calculus (A)

Currently: Changed her major to Civil Engineering and just completed Calculus III

Activity

- Who needs to be involved in the implementation of this process at your college?
- What is each player's role in the implementation?
- What are your concerns?
- What are some obstacles you are running into?

Parking Lot Questions

1. So they get access and they're more successful in *your math* classes, but how are they doing in *classes with a math prereq*?
2. Do the accelerated math pathways work for all modalities (e.g. face-to-face, online, hybrid)?
3. Do you find that it takes longer to get through the same curriculum? Have you had to reduce or eliminate any of the curriculum?

Video (SMAC) at BOG Meeting



Basic Skills Partnership Grant



Contacts

Tammi Marshall

Math Department Chair, Cuyamaca College

Math Coach, California Acceleration Project

Tammi.Marshall@gcccd.edu



C U Y A M A C A
· C O L L E G E ·