

Center for the Analysis of Postsecondary Readiness: Remediation Background

Organization of the Center

MDRC

CCRC

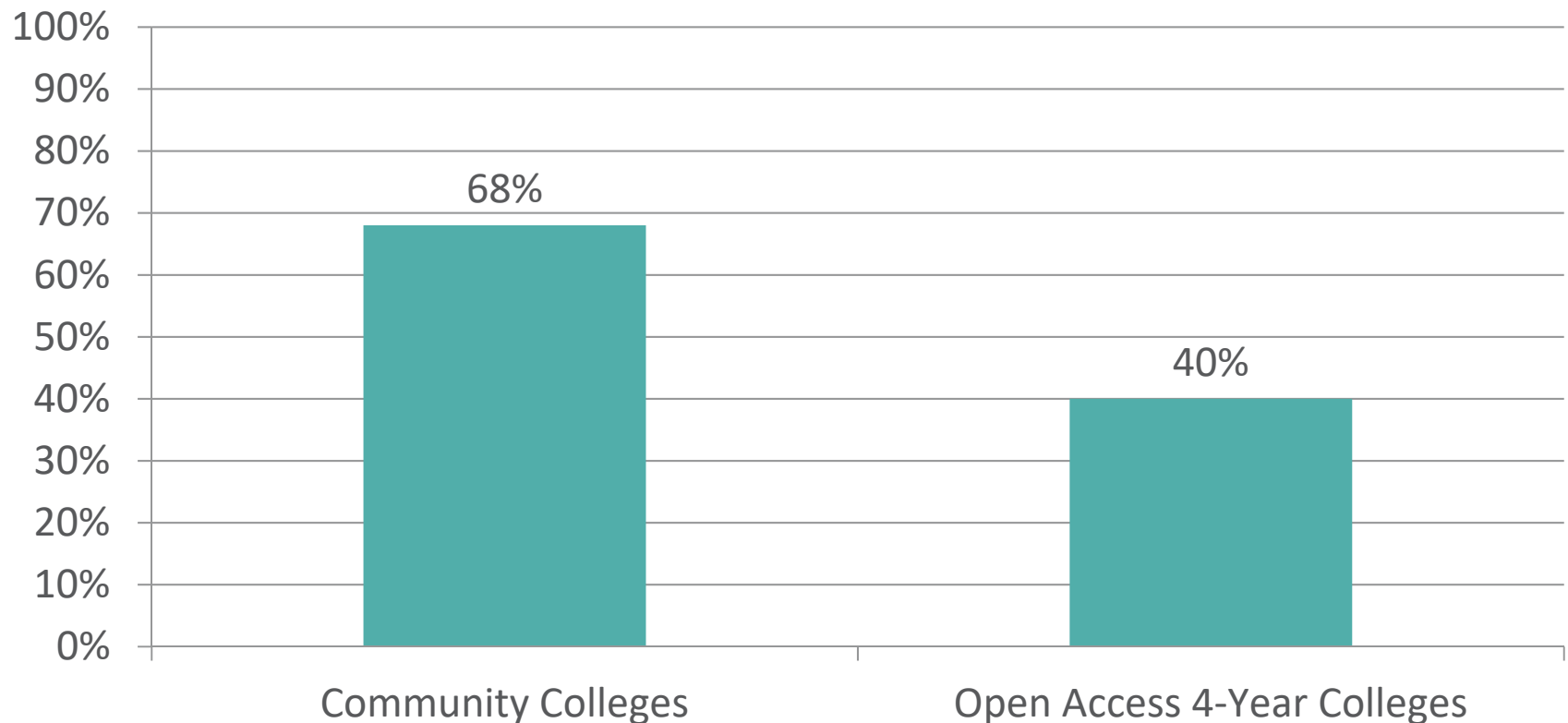
**Descriptive Study
of Developmental
Education**

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

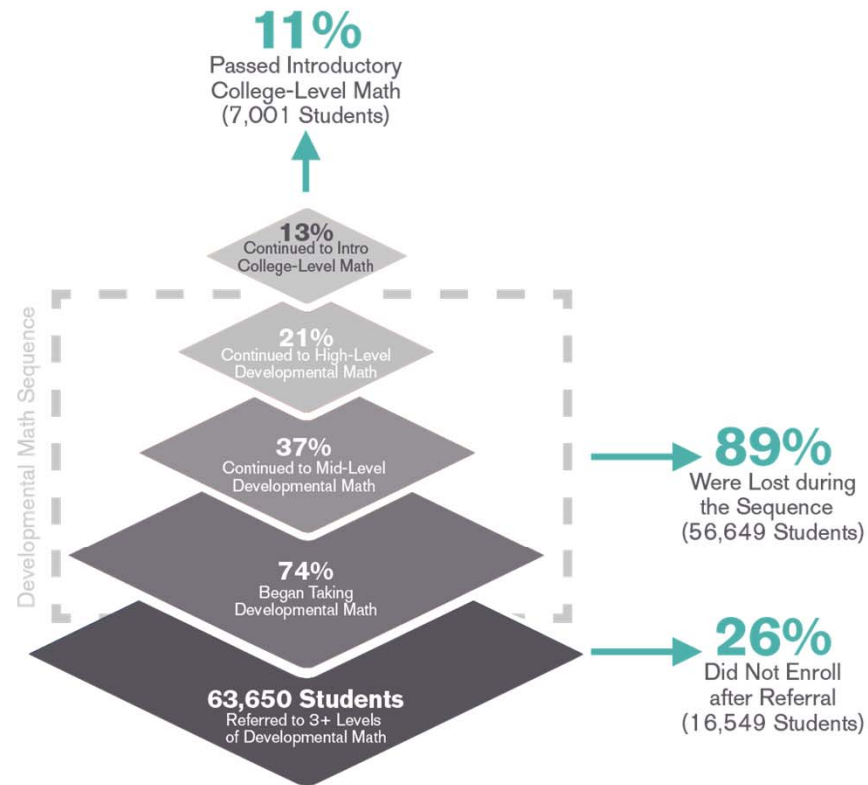
**Evaluation of New
Assessment
Practices
(RCT in NY)**

Supplemental Studies

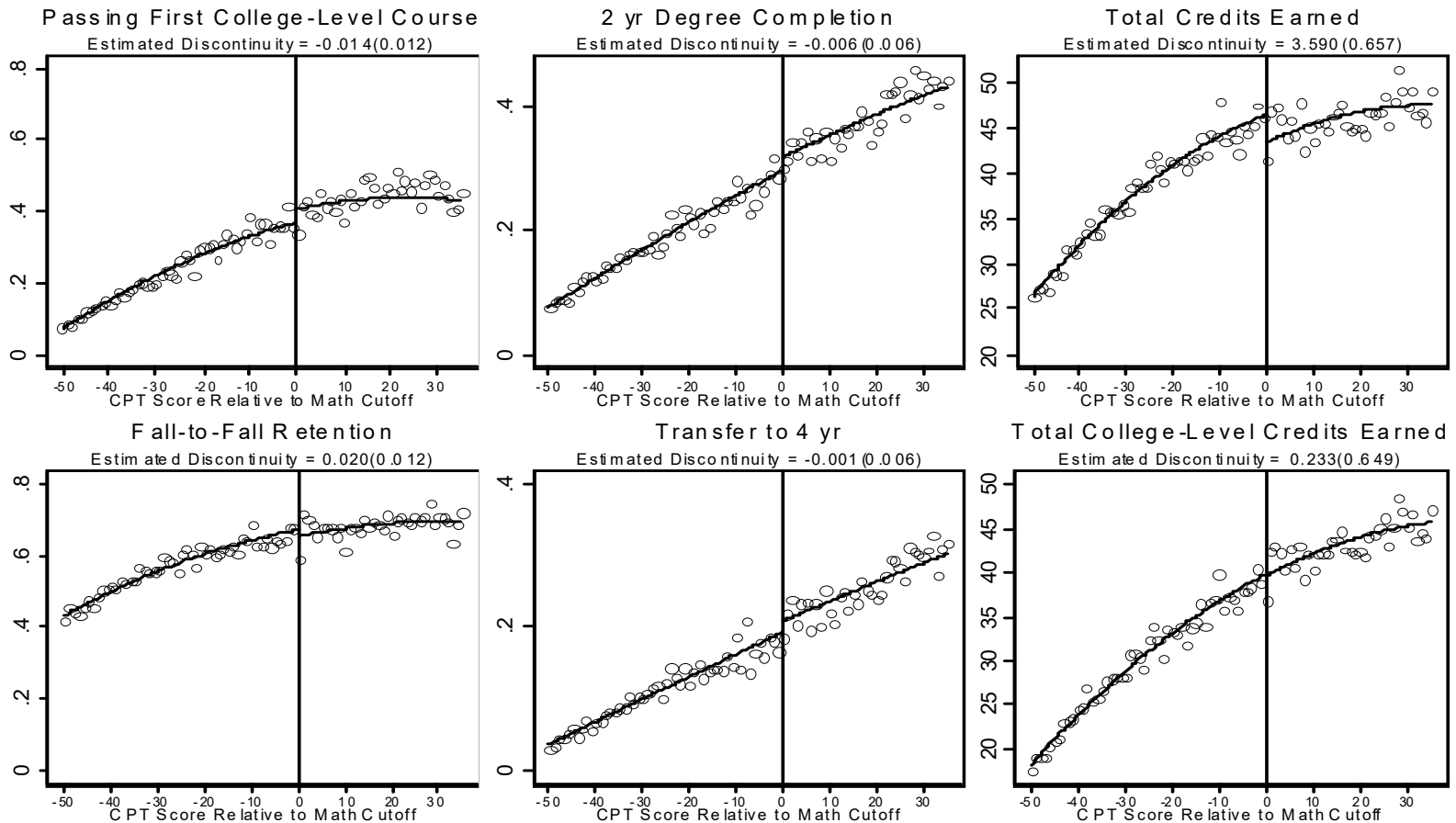
Students Needing 1+ Developmental Education Course (NCES, 2013)



Student Progression Through the Developmental Math Sequence



Educational Outcome by Math CPT Score and Estimated Discontinuity



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National Study of Developmental Education Policies and Practices

Preliminary Results from the Institutional Survey

Alexander Mayer, Deputy Director of Postsecondary Education, MDRC

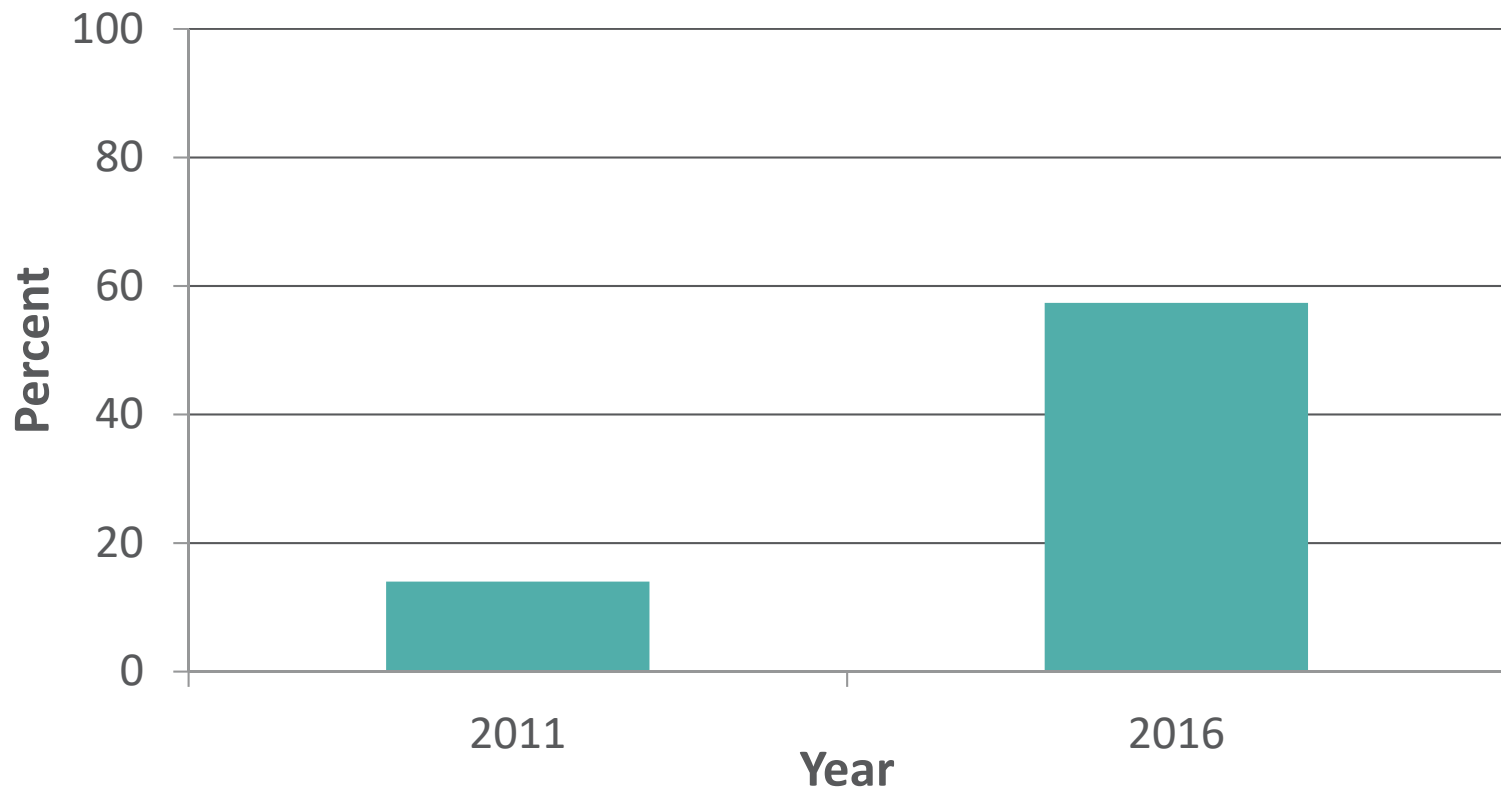
Overview of the Descriptive Study

- **Nationally representative survey**
 - Approximately 1,100 open-access and non-selective institutions
 - Key challenge: identifying respondents
 - Survey was split into 2 sections: math; and reading and writing
 - Fielded in two waves: Spring 2016 and Fall 2016
- **Qualitative study**
 - 40 interviews with institutional leadership
 - 40 interviews with system-level leadership

Survey Response Rate

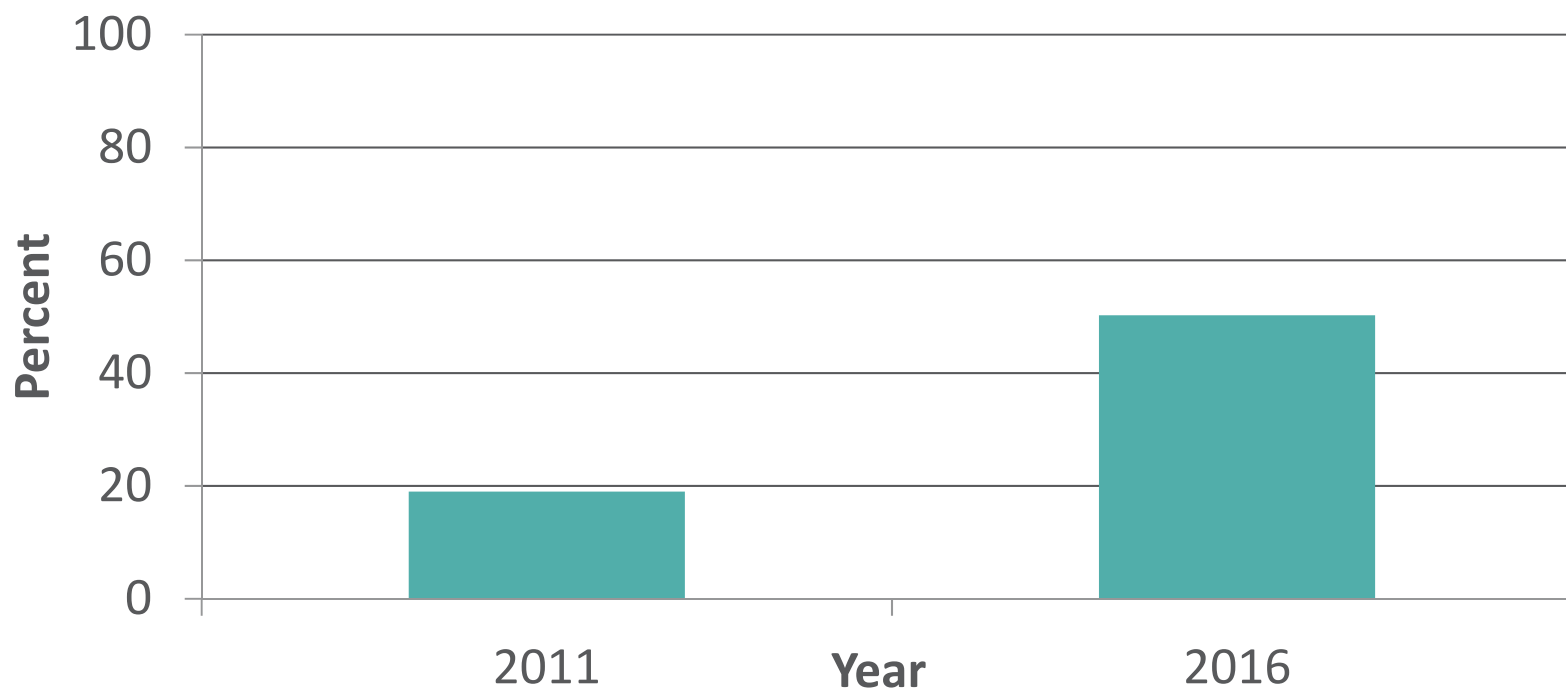
	Sample Size	Math	Reading and Writing
Public 2-year	506	91%	90%
Public 4-year	303	94%	95%
Private non-profit 4-year	279	57%	58%
Total	1,088	83%	83%

Use of Multiple Measures for Assessment Among Public 2-Year Colleges in Math



SOURCES: 2011 data from Fields and Parsad (2012); 2016 data from the Center for the Analysis of Postsecondary Readiness' institutional survey.

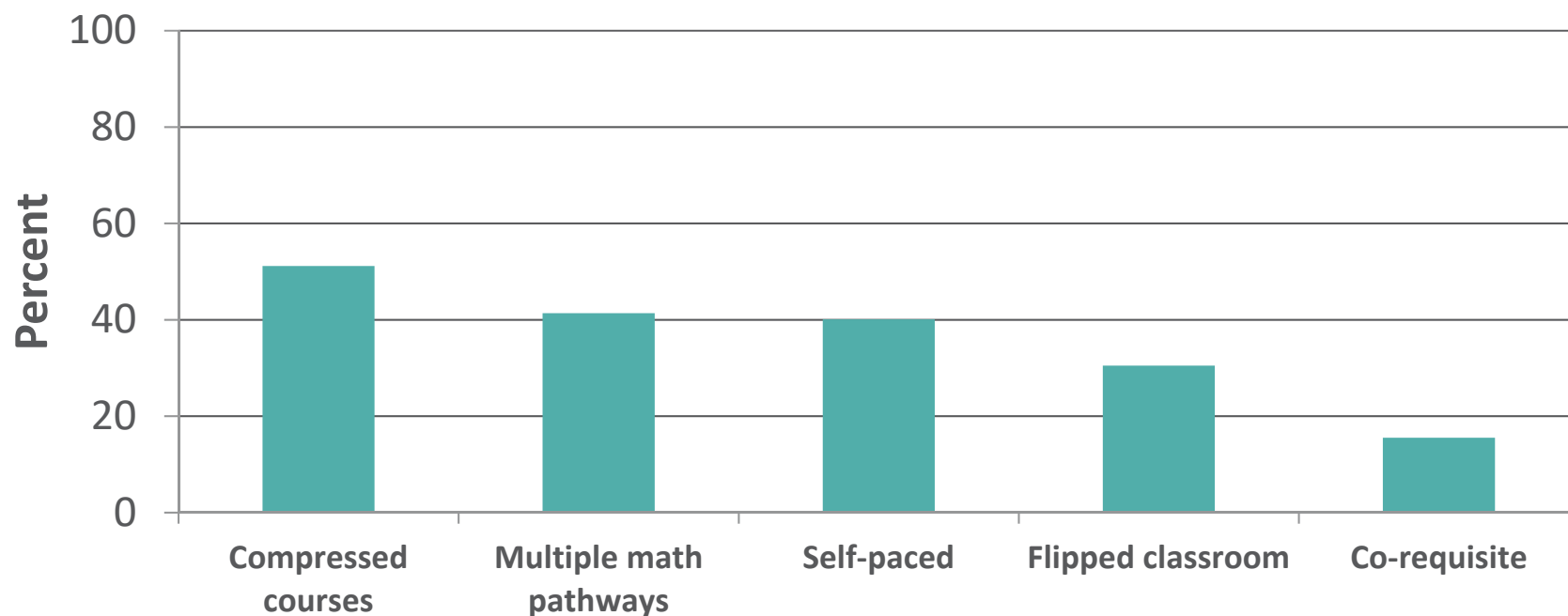
Use of Multiple Measures for Assessment Among Public 2-Year Colleges in Reading



SOURCES: 2011 data from Fields and Parsad (2012); 2016 data from the Center for the Analysis of Postsecondary Readiness' 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.

Prevalence of Developmental Math Instructional Methods Among Public 2-Year Colleges

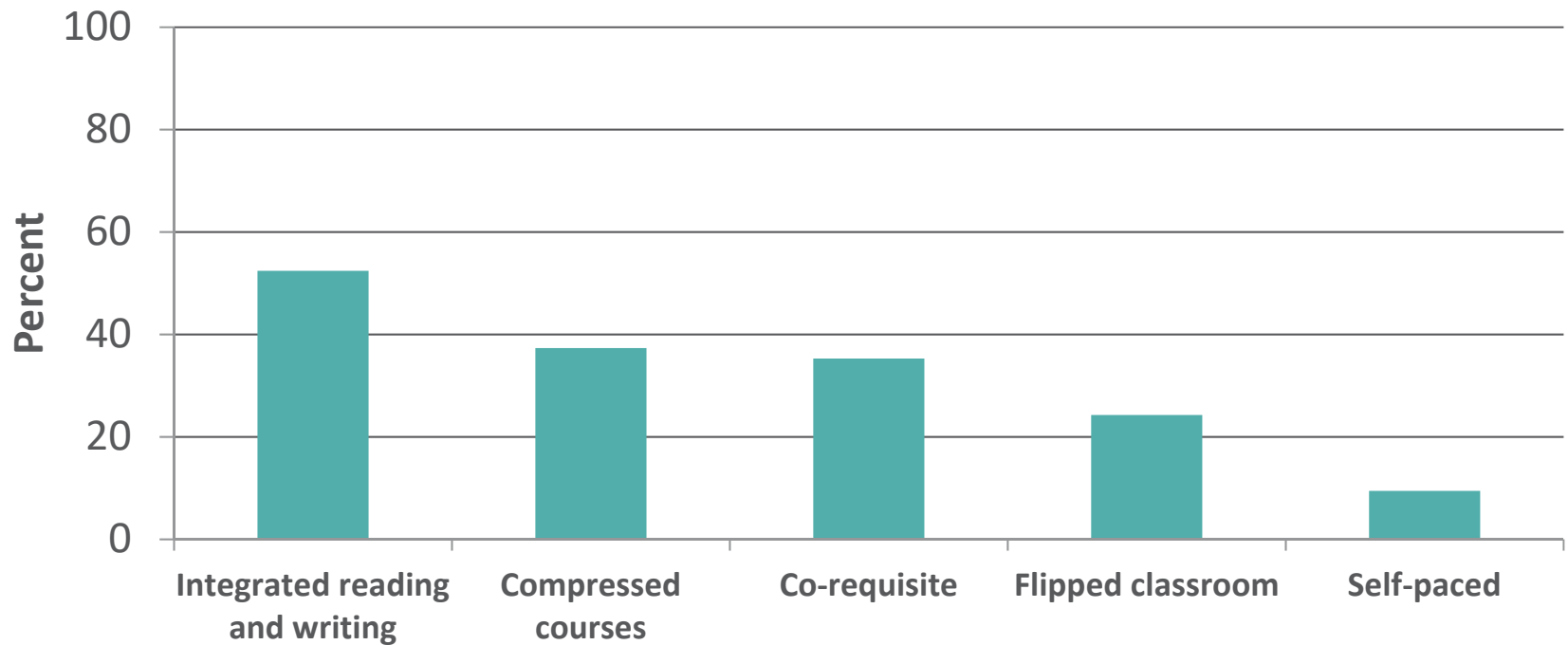


SOURCE: Data from the Center for the Analysis of Postsecondary Readiness' institutional survey.

NOTES: Percentages among 2-year public colleges that reported offering developmental courses. Colleges were counted as using an instructional method if they used it in at least two course sections.

Distributions may not sum to 100 percent because categories are not mutually exclusive.

Prevalence of Developmental Reading Instructional Methods Among Public 2-Year Colleges



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Making Math Count

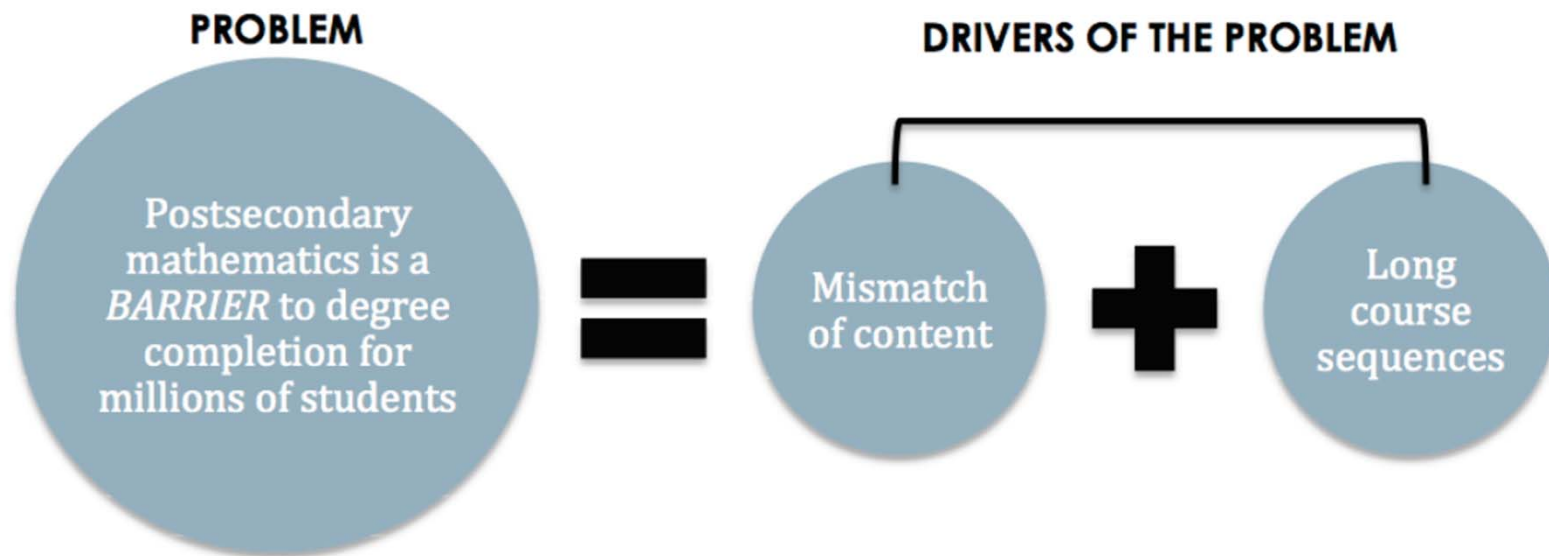
Building Accelerated Math Pathways and Early Findings on their Impact on Students' Success

Elena Serna-Wallender, Research Associate, MDRC

The Dana Center Mathematics Pathways

Key Principles and Model

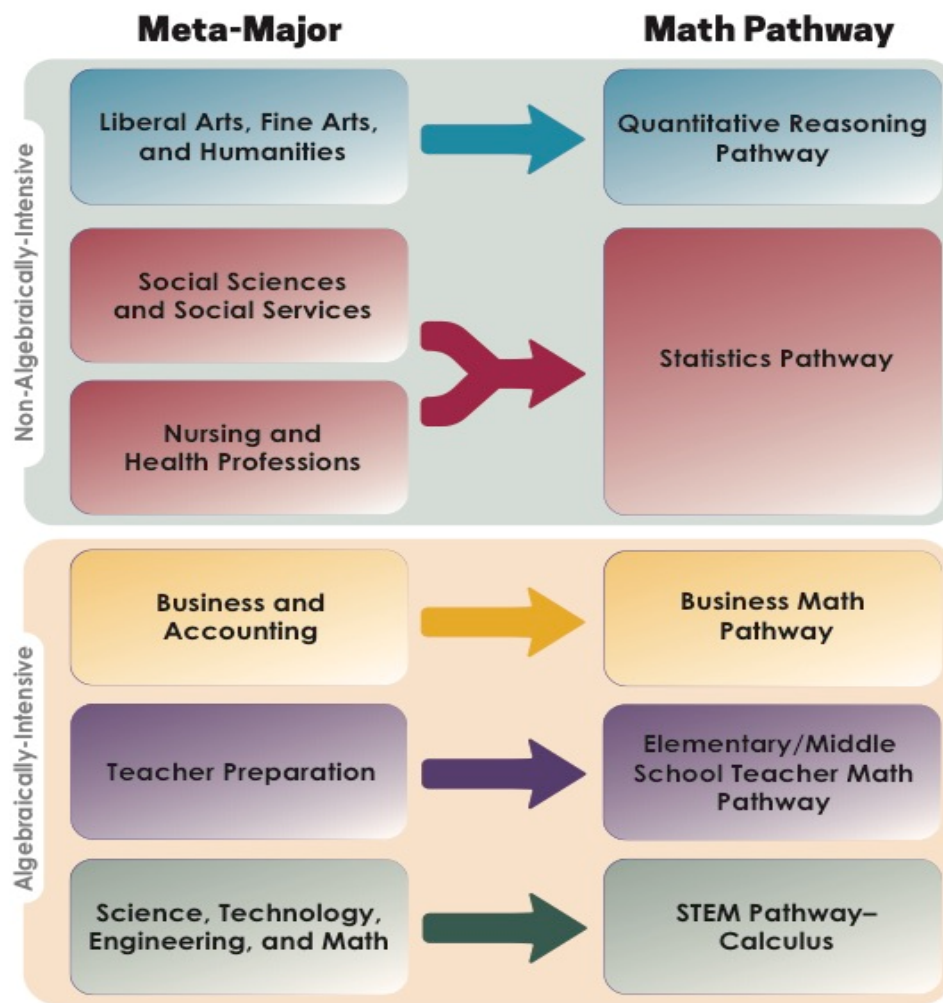
Drivers that Create Barriers for Students



What are the Dana Center Mathematics Pathways (DCMP)?

- **Mathematics pathways are structured so that:**
 - All students, regardless of college readiness, enter directly into mathematics pathways aligned to their programs of study.
 - Students complete their first college-level math requirement in their first year of college.
- **Students engage in a high-quality learning experience so that:**
 - Strategies to support students as learners are integrated into courses and are aligned across the institution.
 - Instruction incorporates evidence-based curriculum and pedagogy.

Emerging National Math Pathways

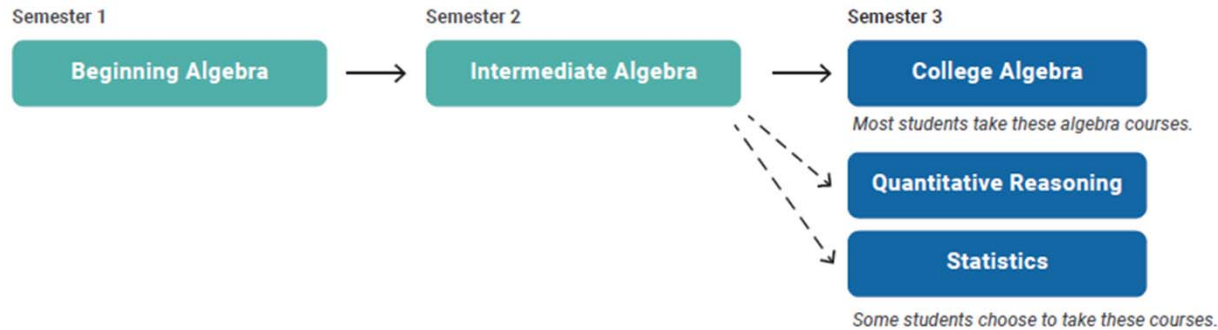


The DCMP Model

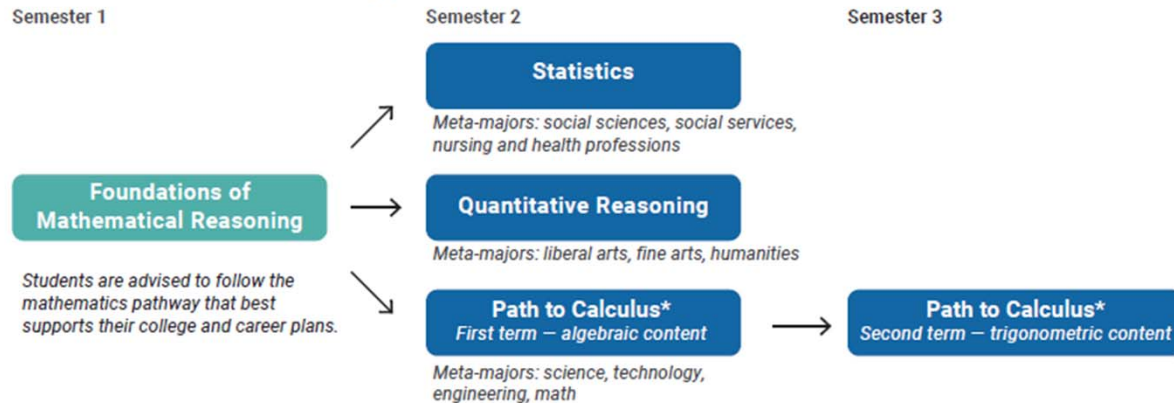
FIGURE 1. A Comparison of Mathematics Offerings for Students with Two Levels of Developmental Need

■ Developmental ■ College-Level

Traditional Developmental Math



Dana Center Mathematics Pathways



*Evaluation of these courses is outside the scope of this study.

The DCMP's Key Pedagogical Changes

- **Active learning**
 - Small group work; student interaction; presenting solution methods
- **Contextualization**
 - Problems contextualized in real-life situations
- **Problem solving**
 - Multi-step problems building on previously learned content or answers
 - Multiple solution methods
- **Constructive perseverance**
 - Understanding the role struggle plays in learning
- **Reading and writing**

Sample DCMP Problem

- A research report estimates that individuals who smoke are 15 to 30 times more likely to develop lung cancer than individuals who never smoke. If the lifetime risk of developing lung cancer for non-smokers is about 1.9%, what is the lower limit of the estimated risk for smokers according to the report?
- The lower limit of the estimated risk for smokers according to this report is _____ %.

The DCMP Evaluation

Overview and Early Findings

A Mixed Methods Study of the DCMP

Research questions:

- Do DCMP students have better academic outcomes than students in traditional developmental math programs?
- To what degree is there fidelity to the DCMP model across colleges? What aspects of the DCMP are consistent across sites? What adaptations were made and why?
- How do the curriculum and pedagogy in the DCMP courses differ from the colleges' traditional developmental math courses?
- Is the DCMP cost-effective relative to business as usual?

A Mixed Methods Study of the DCMP

- **Four study components:**
 - Random Control Trial (RCT)
 - Implementation study
 - Student survey
 - Cost study
- **Colleges involved, and timing:**
 - El Paso Community College, Trinity Valley Community College, Eastfield College, and Brookhaven College
 - 4 cohorts of students: Fall 2015, Spring 2016, Fall 2016, Spring 2017
 - Tracking outcomes for at least 2 semesters

The Interim Report: The Sample

- 563 students
- 1 semester of data
- Most students were in the developmental math class
- Most students were in majors aligned with pathways
- 80% = 2 developmental course needs

Key Challenges to Implementing and Evaluating the DCOMP

- **Cross-systems change**
 - Will four-year transfer colleges accept non-algebra math courses?
- **Institutional change**
 - Which majors should have revised math requirements?
 - Will faculty approve these changes?
 - Will advisors place students into courses?
- **Content change**
 - Are math faculty comfortable with a move away from algebra?
- **Pedagogical change**
 - Can faculty implement more student-centered, active learning instructional methods?

The Interim Report: Key Implementation Findings

Success with four big changes:

1. Alignment with four-year colleges

- Progress was made with some continuing challenges

2. Advising revisions: More time was spent with students to identify correct major

- Some students were targeted, but not all eligible students

The Interim Report: Key Implementation Findings

- 3. Changes to course content: Integration of statistics and quantitative reasoning**
 - Strong implementation → The course content was very different

- 4. Pedagogy change: Contextualization of content and use of more student-centered approaches**
 - Relatively strong implementation → Students had a qualitatively different classroom experience

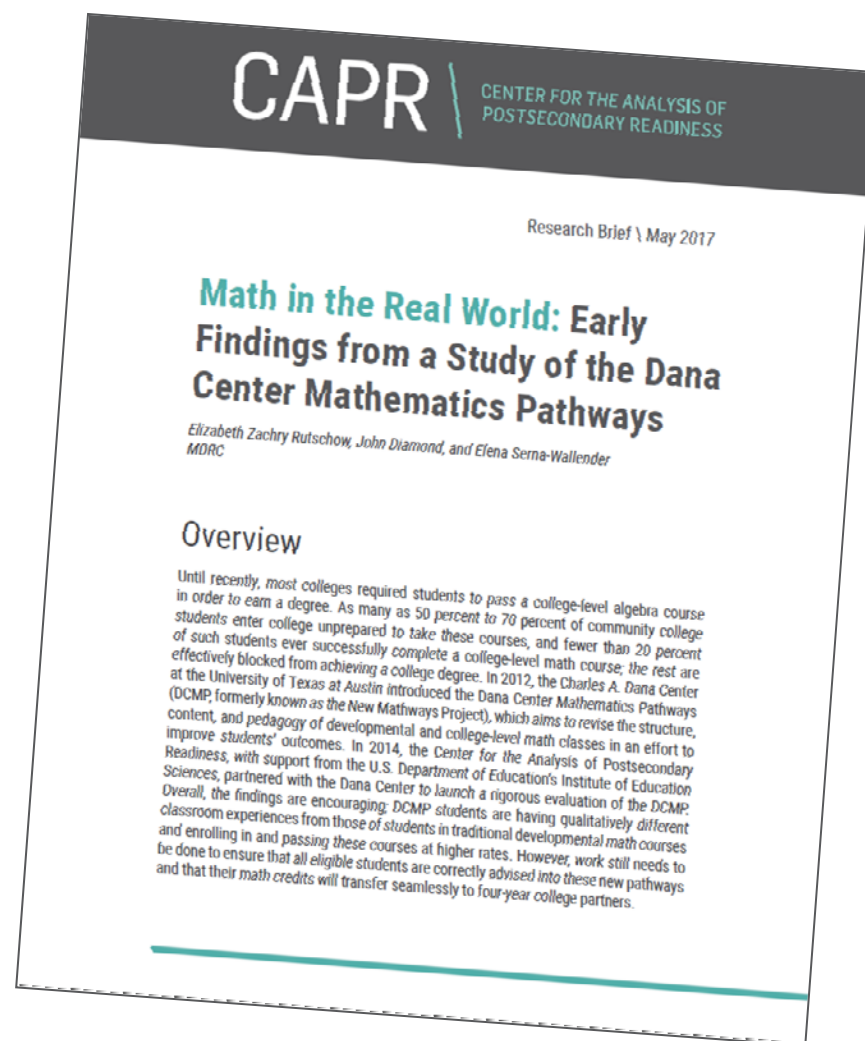
The Interim Report: Impact Findings

	Program group	Standard group	Difference	Standard Error
Registered (%)	87.8	85.9	1.8	2.8
Registered for developmental math course (%)	77.9	67.8	10.1***	3.7
Passed developmental math course (%)	47.1	36.6	10.5**	4.1

The Interim Report: Findings in Context

- **Findings are promising, but it's still early**
 - DCMP students are well positioned to take college-level math classes... but how will they perform?
- **The DCMP study is unique in...**
 - The level of rigor
 - The analysis of implementation
 - A deeper look inside the classroom

- **Publicly available reports:**
 - Interim brief (Summer 2017)
 - Interim update on student outcomes (Summer 2018)
 - Final report (Summer 2019)
- **Available at www.mdrc.org.**





Research on an Alternative Student Assessment and Placement System

Today's Presentation

- Why we need to change assessment and placement
- The CAPR research design
- Early findings

Under-placement and Over-placement (Severe)

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

An Alternative – Use of Multiple Measures

- Use of more measures produces more accurate results.
- The high school GPA is an especially good predictor of success in college level courses (Scott-Clayton, 2012; Belfield and Crosta, 2014).
- Initial studies suggest that student outcomes improve when placement is more accurate.

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

Multiple Measures Options (CAPR study)

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

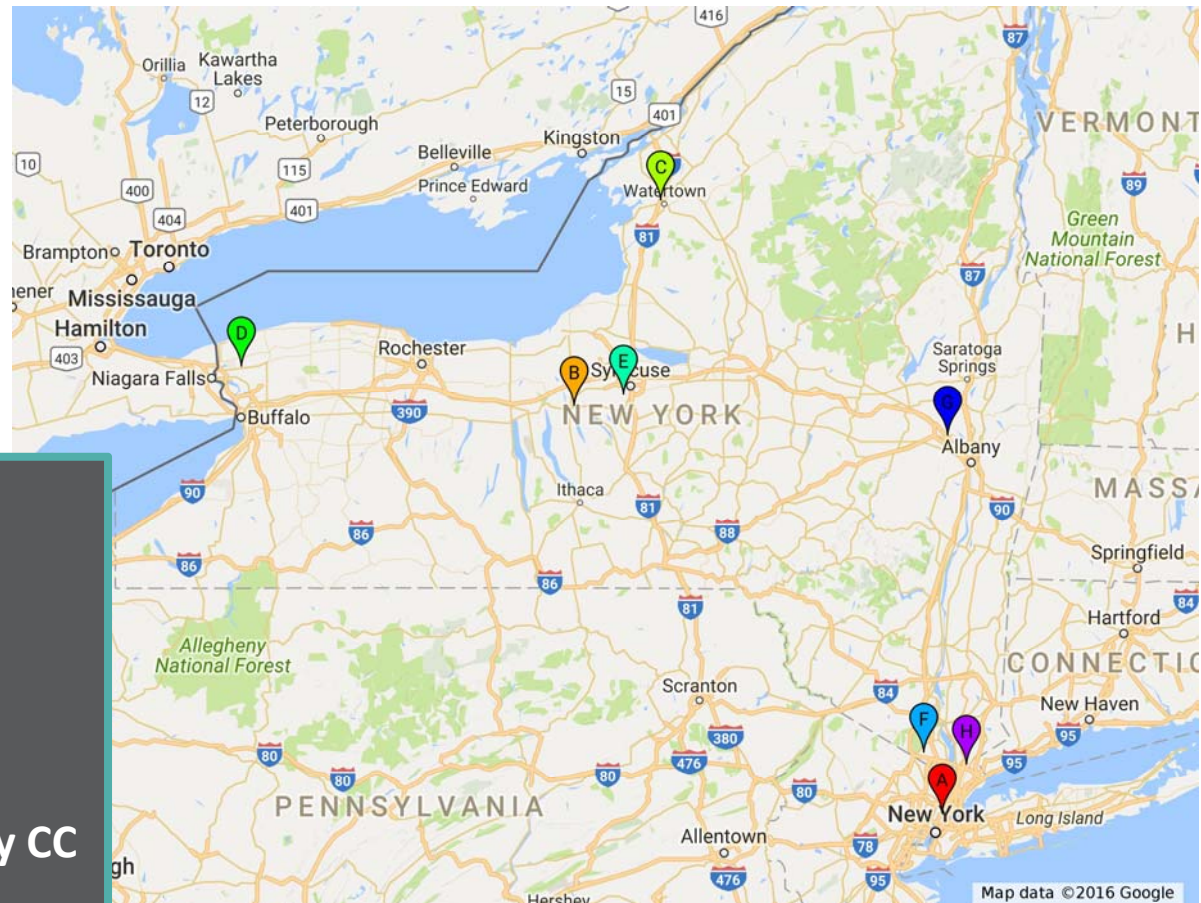
Research on Alternative Placement Systems (RAPS)

2014 - 2019

Research Questions (Summary)

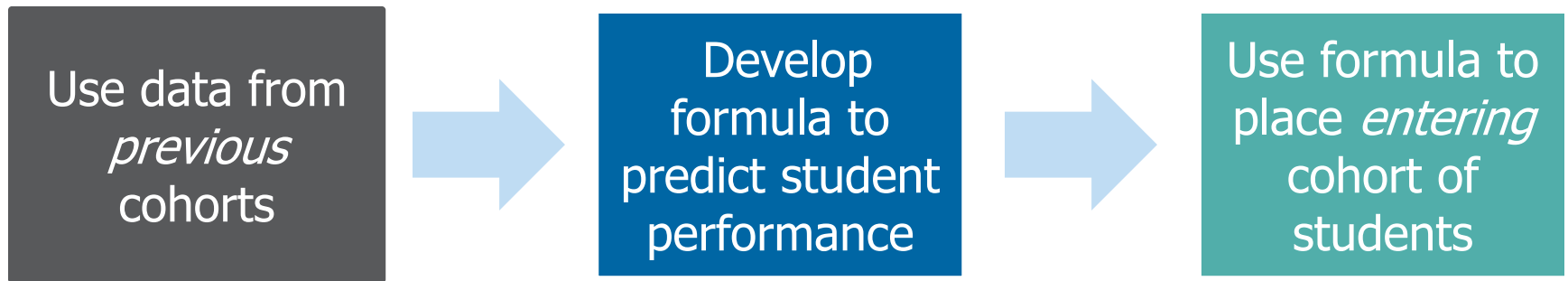
1. Do student outcomes improve when they are placed using predictive analytics?
2. How does each college adopt/adapt and implement such a system?

RAPS – Partner Sites

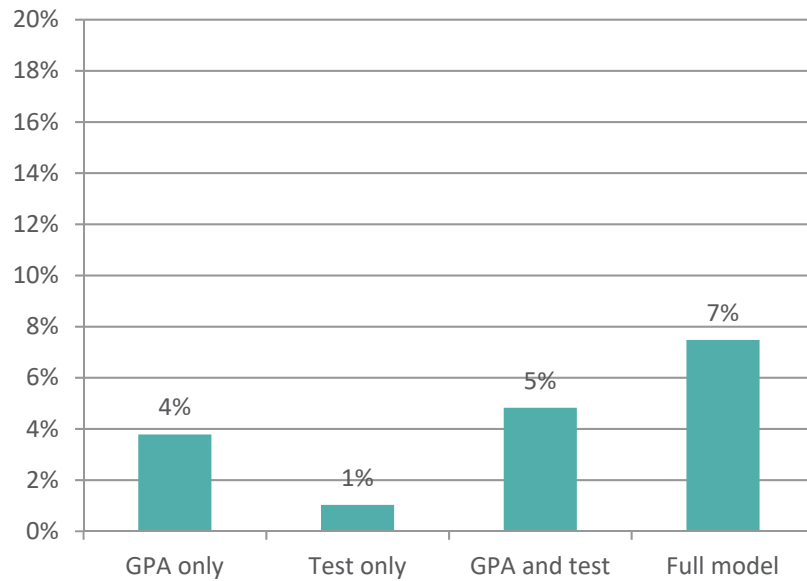


- A – CAPR/CCRC/MDRC**
- B – Cayuga CC**
- C – Jefferson CC**
- D – Niagara County CC**
- E – Onondaga CC**
- F – Rockland CC**
- G – Schenectady County CC**
- H – Westchester CC**

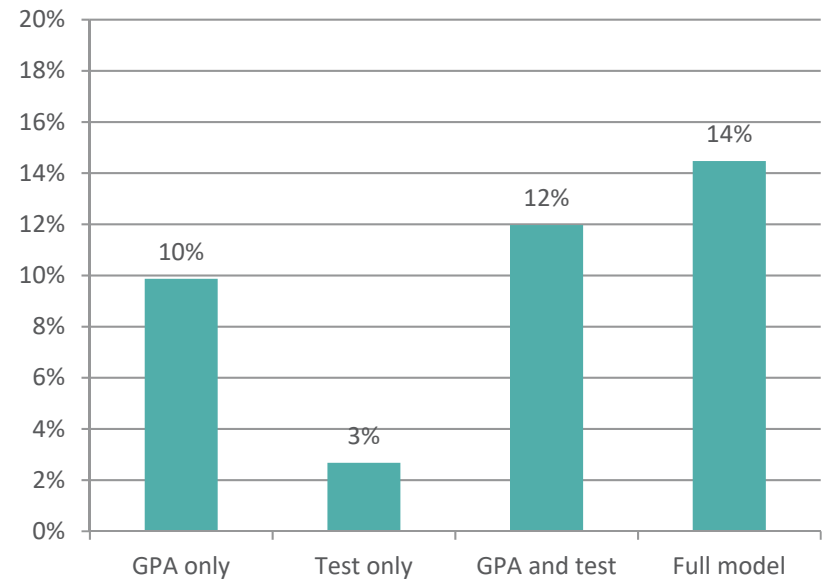
How Does the Algorithm Work?



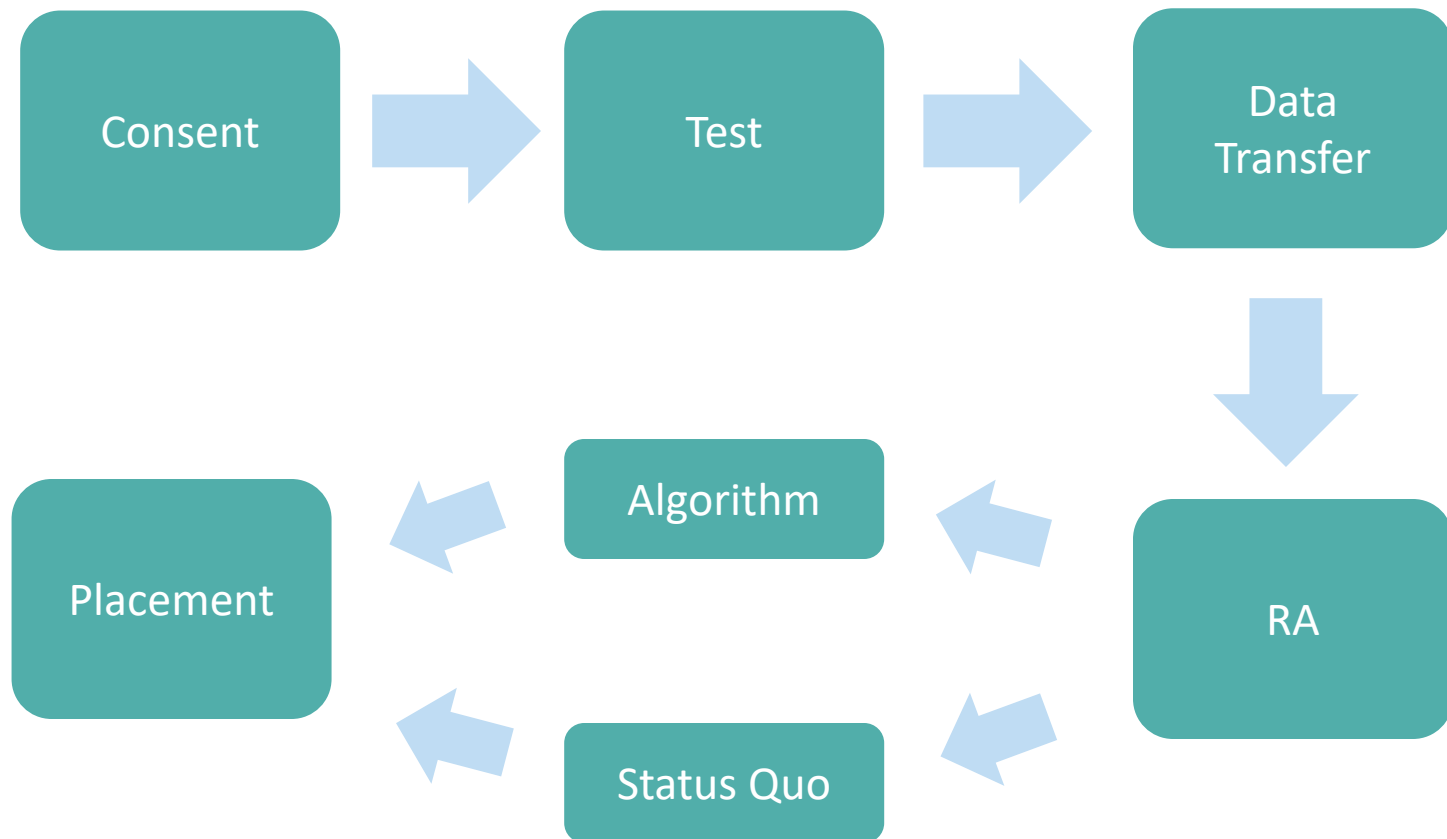
COLLEGE 2: ENGLISH



COLLEGE 2: MATH



Components of the RA Process



Outcomes of Interest

PRIMARY

- Subject areas sequence completed (through first college level)
- Accumulation of college credits.

EXPLORATORY

- Initial placement
- Completion of first college level courses
- Persistence
- Completion

Early Findings – Full Sample

Fall 2017

Final Analysis Sample

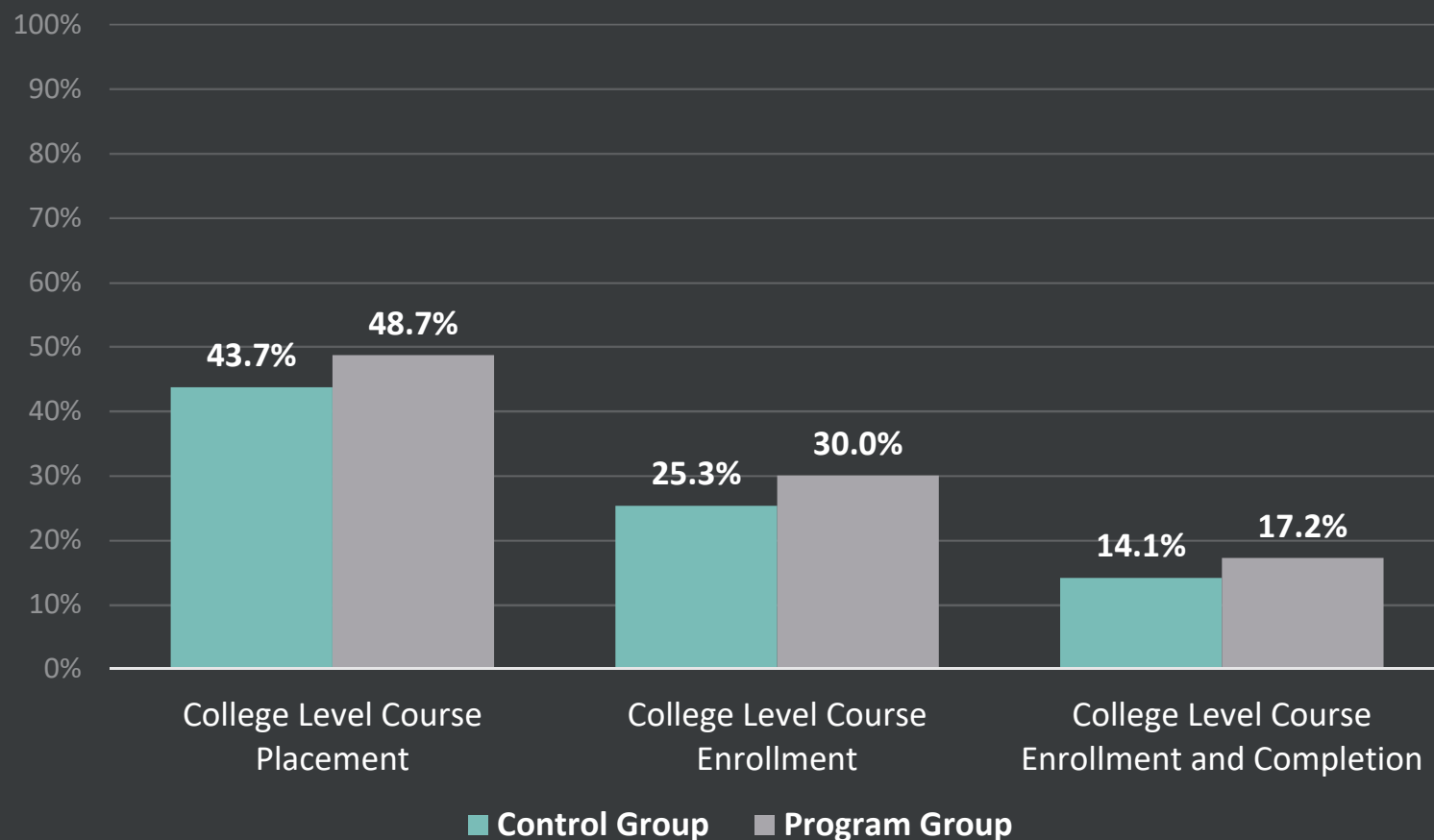
Following students were excluded:

- Placed into ESL course
- Date of first placement exam outside intake period for fall 2016
- Still in high school at the time of enrollment
- Took placement tests across multiple days at 2 colleges (n=45)

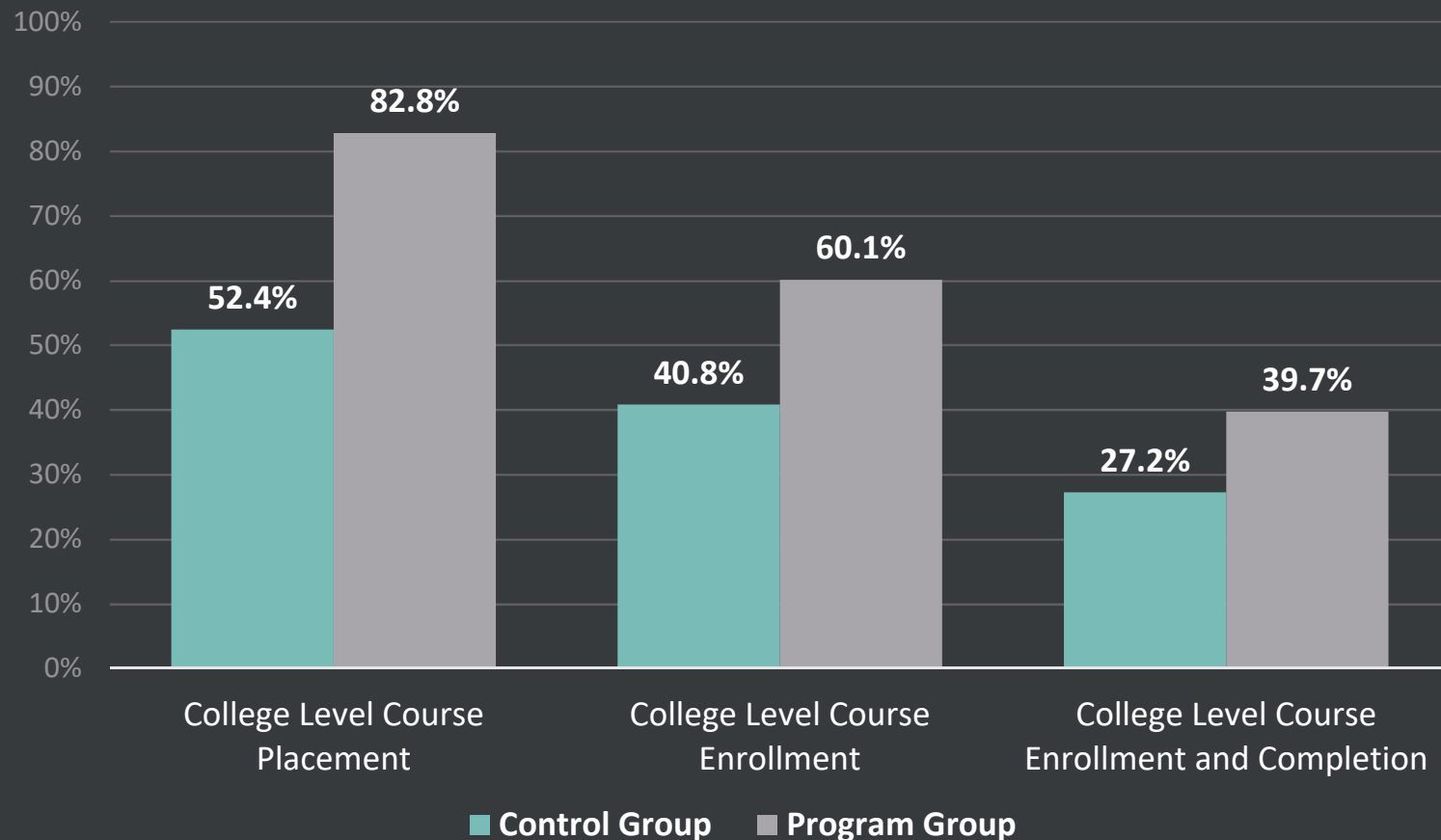
Final Sample 4,729 first year students across 5 colleges

- 48% of students assigned to control group (n=2,274)
- 52% of students assigned to treatment group (n=2,455)
- 82% of students enroll into at least one course in 2016 (n=3,865)

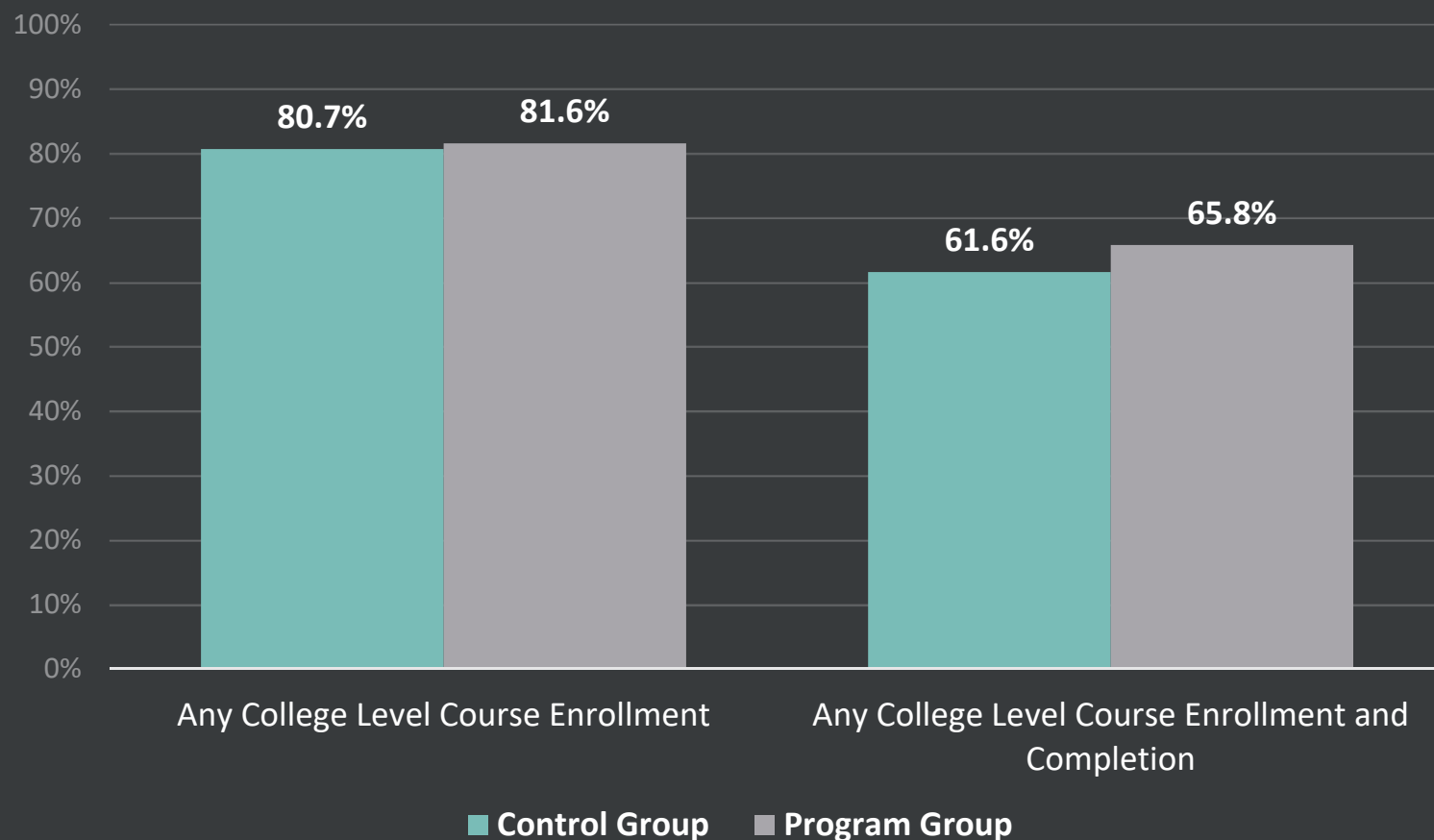
Treatment Effects: Math



Treatment Effects: English



Treatment Effects: Any College Level Course



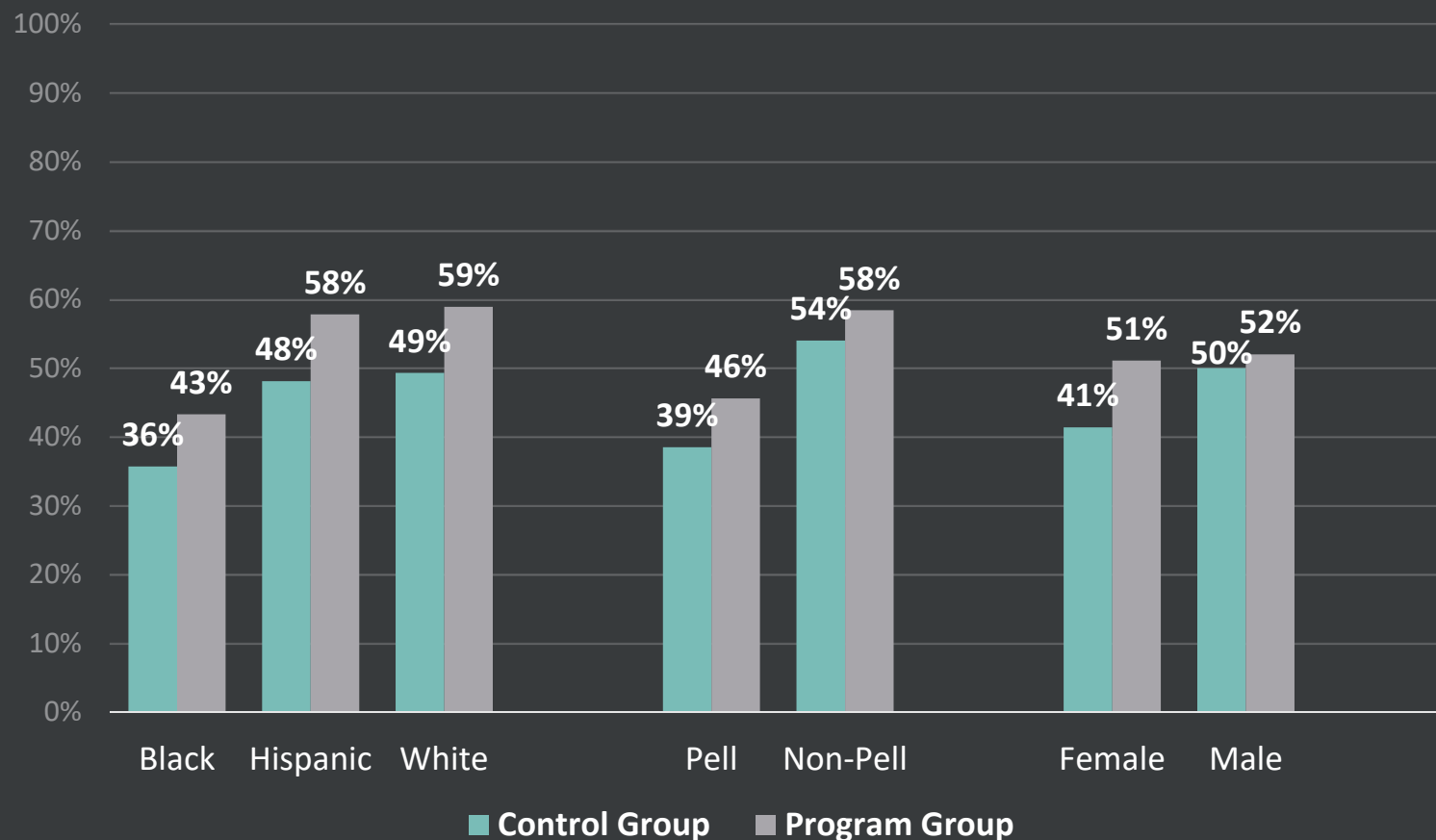
Treatment Effects: Total College Level Credits Earned



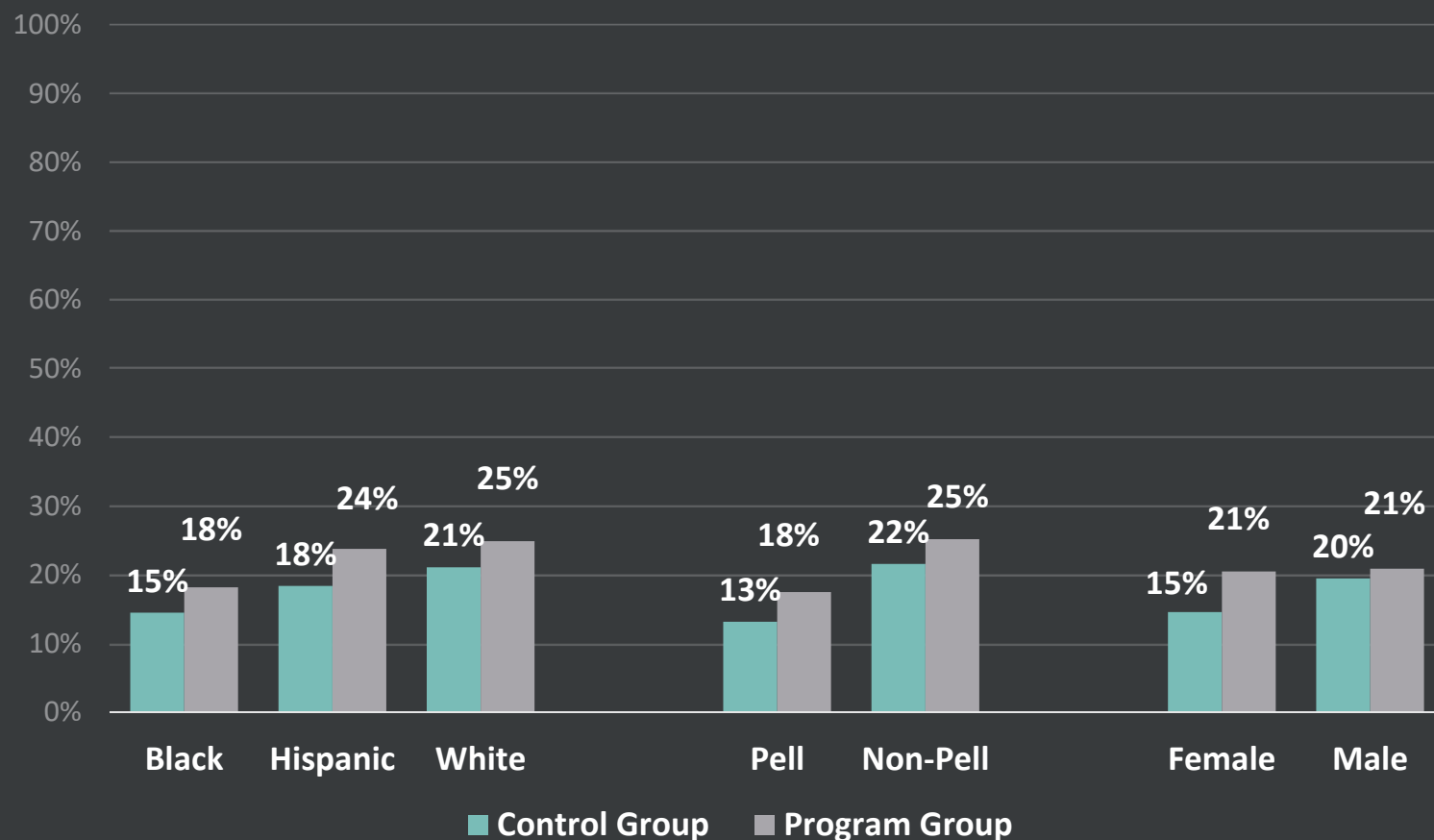
Early Findings – Subgroup Analysis

Fall 2016

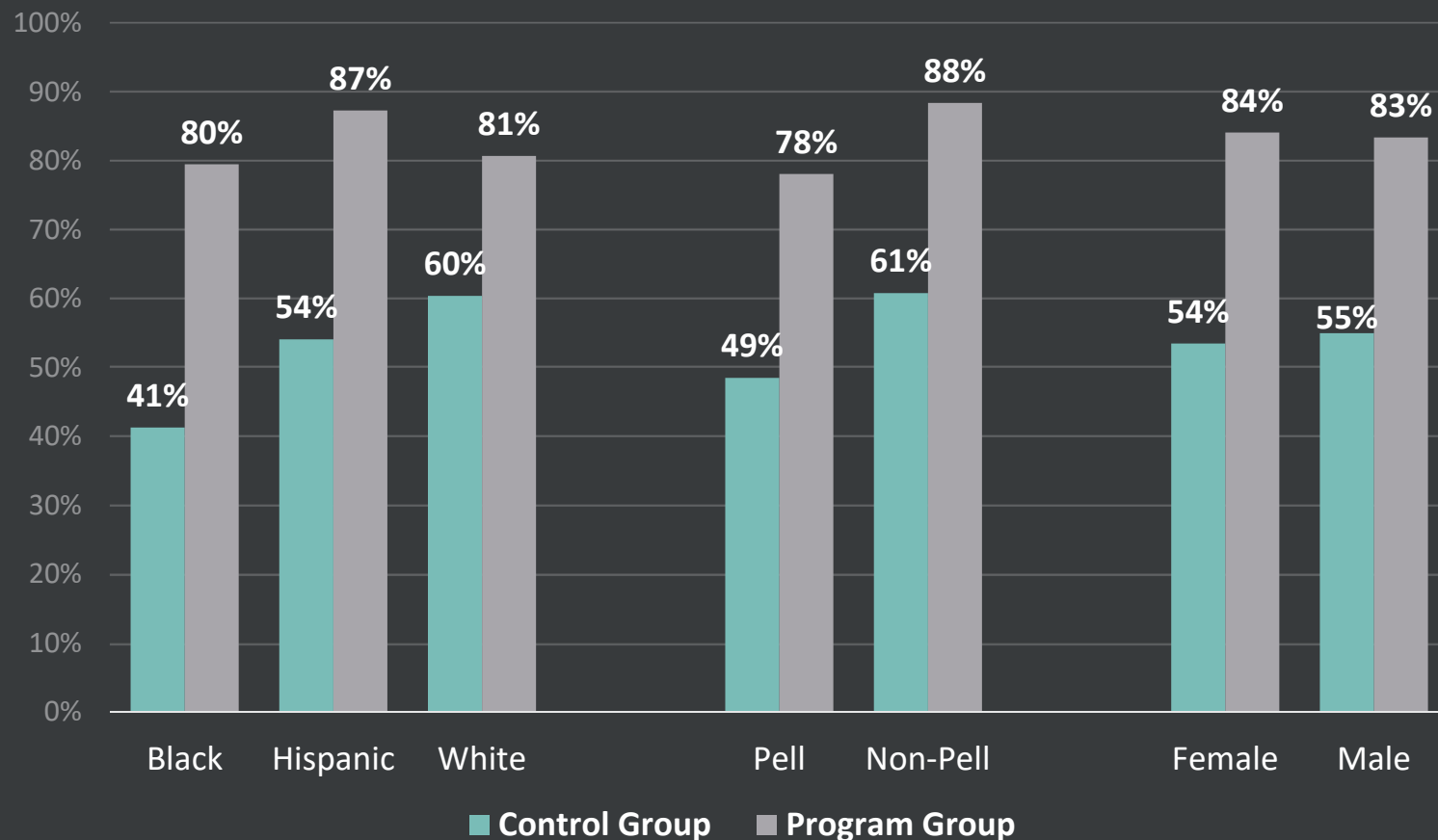
Treatment Effects: College Level Math Placement



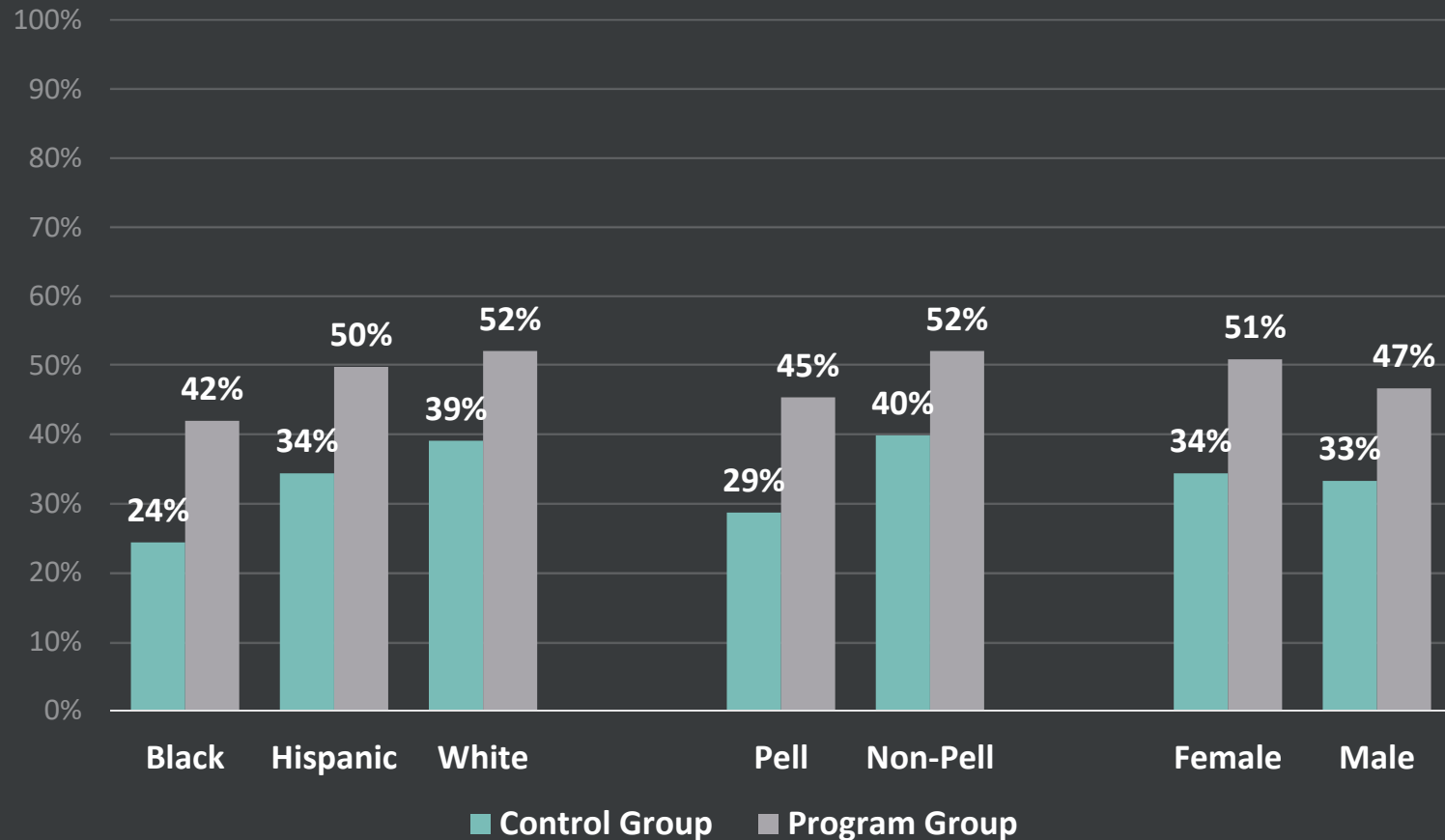
Treatment Effects: College Level Math Completion



Treatment Effects: College Level English Placement



Treatment Effects: College Level English Completion



Some Issues

1. Assessment, placement and developmental education practices are changing rapidly.
2. Data are seldom available for key variables that may predict success in college (e.g., “non-cognitive” measures).
3. High school data are seldom in college data systems.
4. Many people in the college community are affected when placement systems are changed.

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