



VCCA GPA Study 2: Association between GPA and mathematics course placement

Deborah Jonas
Marshall Garland

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Overview

- Background and prior findings
- Availability of GPA data
- Analytic results

Background

- VCCS is interested in understanding the indicators that are predictive of enrollment and success in credit-bearing courses (CBCs).
- Previous analysis focused on answering the following questions:
 - To what extent can students' high school courses and other available data accurately predict student placement into credit bearing and developmental education courses?
 - What factors contribute to students' placement in math CBC in Virginia's Community Colleges?
 - Malleable factors, such as actual courses taken, diploma earned
 - Non-malleable factors, such as race/ethnicity, economically disadvantaged status, students high school and locale

*VCCS currently uses the Virginia Placement Test (VPT) to determine students' course placement.

Summary of results from prior analysis

- A combination of high school diploma type and highest math course taken in high school offered the highest degree of consistency with current placement practices*
 - Placement results were useful but not sufficiently granular to develop policy.
- The available data did not provide meaningful predictors of first year math course success
 - Predictions were no better than chance.

*VCCS currently uses the Virginia Placement Test (VPT) to determine students' course placement.

The current study

- Primary research question
 - To what extent is student GPA associated with student placement in VCCS credit-bearing courses?
- Limited in scope—focused on associations between GPA and mathematics course placement only.

Data overview

- Sample
 - 2013 public high school graduates who enrolled in Virginia Community Colleges within year of high school graduation
- High school variables
 - Math courses taken
 - Diploma type (Advanced Studies or Standard)
 - Grade point average (GPA; for a subset)
 - Demographic and school data
- College variables
 - VPT outcome
 - Math course placement in the first year of college

What's in a Standard and Advanced Studies diploma?

- Students who earn **Standard diplomas** are not required to take Algebra II or similarly rigorous math courses.
 - They must complete Algebra I and Geometry.
 - They must complete a third course that may be at the level of Algebra I (e.g., Computer mathematics).
 - The full list of approved courses is available at: http://www.doe.virginia.gov/instruction/graduation/approved_courses.pdf.
- In other areas, **Standard diploma** earners:
 - May have only 3 lab science courses (compared to 4 for Advanced Studies diploma earners).
 - May complete only 3 History and Social Science courses (compared to 4 for Advanced Studies diploma earners).
 - Have no foreign language requirements.
- Standard diploma earners who have identified disabilities may have other accommodations, including alternative course taking requirements. For details, visit, http://www.doe.virginia.gov/instruction/graduation/credit_accommodations.shtml

Diploma type	Core Course Requirements	High school course credits required
Advanced Studies diploma	English	4
	Mathematics*	4
	Lab Science	4
	History and Social Sciences	4
	Foreign Languages	3
	Health and Physical Education	2
	Fine arts or Career and Technical Education	1
	Economics and Personal Finance	1
	Electives	3
	Total	26
Standard diploma	English	4
	Mathematics**	3
	Lab Science	3
	History and Social Sciences	3
	Health and Physical Education	2
	Foreign Languages, Fine Arts, or Career and Technical Education	2
	Economics and Personal Finance	1
	Electives	4
	Total	22
	* All courses are required to be at or above the level of Algebra and include at least three different course selections from among: Algebra I, Geometry, Algebra II, or other mathematics courses above the level of Algebra II.	
**All courses are required to be at or above the level of Algebra and include at least two course selections from the following list: Algebra I; Geometry; Algebra, Functions and Data Analysis; Algebra II, or other mathematics courses above the level of Algebra II.		

Important notes on GPA data

- There is no standardized, required method to calculate GPA in Virginia public schools.
- There is no statewide grading standard that divisions use to calculate GPA (e.g., no standard defining the required average to earn an A).
- GPA data from public high school graduates are not readily available in Virginia's statewide data sets.
- VDOE carried out a one-time data collection to support this study.

Overview of Research Methods

- Multiple regression
 - Provides information about the various factors that make unique and significant contributions to students' likelihood of being placed in a CBC using current practice.
- Simple correlation
 - Provides information about the association between GPA and course placement.
 - Does not account for other factors that influence placement, such as the students' high school, gender, etc.
- Other descriptive statistics

Availability of GPA data, 2013 public high school graduates who enrolled in VCCCS

GPA Data Type	Percent of Students	Number of Students
Unweighted GPA data	44.5	8,666
Weighted GPA data	14.1	2,739
GPA data missing	41.5	8,073
Total	100	19,478

*Weighted/unweighted GPA status determined by overall school division GPA data. Students who graduated from divisions that submitted GPA data > 4.0 were classified as having weighted GPAs.

Differences between students with and without GPA data

- Students with missing GPA data were:
 - More likely to be white, non-Hispanic than other ethnicities
 - More likely to have earned an Advanced Studies (i.e., college prep) diploma and less likely to earn a Standard (non-college prep) diploma
 - *Slightly* less likely to be economically disadvantaged
- There were almost no differences in English and math course placement patterns for students with and without GPA data.

Some important information about the analysis

- Focused primarily on understanding association between GPA and first-year math course placement.
- We examined other factors that are associated with students' placement in credit-bearing courses (CBC) in math.
- Due to current VCCS policy, current course placement is a function of student outcomes on VPT (or other approved test).

Considerations in policy development

- These analysis provide information about the statistical likelihood that an alternative measure results in the same placement that would result from taking VPT.
- How might this inform policy and practice?
 - Hypothetically: If a GPA of 2.6 results in a 50% chance of enrolling in a CBC:
 - Is 50% sufficient to guide policy?
 - What about a 98% chance? 10% chance?
- A number of factors influence placement in addition to GPA.

VCCS policy template concept

Transcript Data	Placement
Unweighted GPA equal to or less than _____ And *****	Satisfies MTE 1-3 and ENF 2. Student is college-ready for MAT XXX and any course that has MTE 1-3 as a prerequisite. Student is college-ready for ENG 111/ ENF 3.
Unweighted GPA equal to or less than _____ And *****	Satisfies MTE 1-5 and ENF 3. Student is college-ready for MAT XXX, XXX, or XXX and any course that has MTE 1-5 as a prerequisite. Student is college-ready for ENG 111.
Unweighted GPA equal to or less than _____ And *****	Satisfies MTE 1-9 and ENF 3. Student is college-ready for MAT XXX, XXX, and XXX and any course that has MTE 1-9 as a prerequisite. Student is college-ready for ENG 111.
Unweighted GPA less than _____	College will evaluate subject-area ACT or SAT scores to determine if student is college ready in math and English using the following scores (based on national and state validation studies): English: ACT Reading 20 OR ACT English 18 SAT Writing 500 OR SAT Critical Reading 500 Math: ACT Math 22 SAT Math 500
Unweighted GPA less than _____	Student will take the Virginia Placement Test to determine placement.
Students without a recent transcript GPA or without ACT or SAT scores	Student will take the Virginia Placement Test to determine placement.

********* Indicates other transcript data (if any) that would be used along with GPA for placement **determination, such as 4 years of math.**

Yellow indicates information to be determined, i.e., GPA.

Green indicates a question about English placement.

Questions before we look at data

What observed factors influence students' likelihood of enrolling in a CBC?

Malleable factors*

- Diploma type
- Highest math class taken
- AP course participation
- GPA

Non-malleable factors

- Race/ethnicity
- Gender
- High school from which the student graduated

Factors are based on models that include achievement and sociodemographic factors. The list of factors includes those that were consistent in models using weighted and unweighted GPA.

*Malleable factors are those that can be changed by the education system.

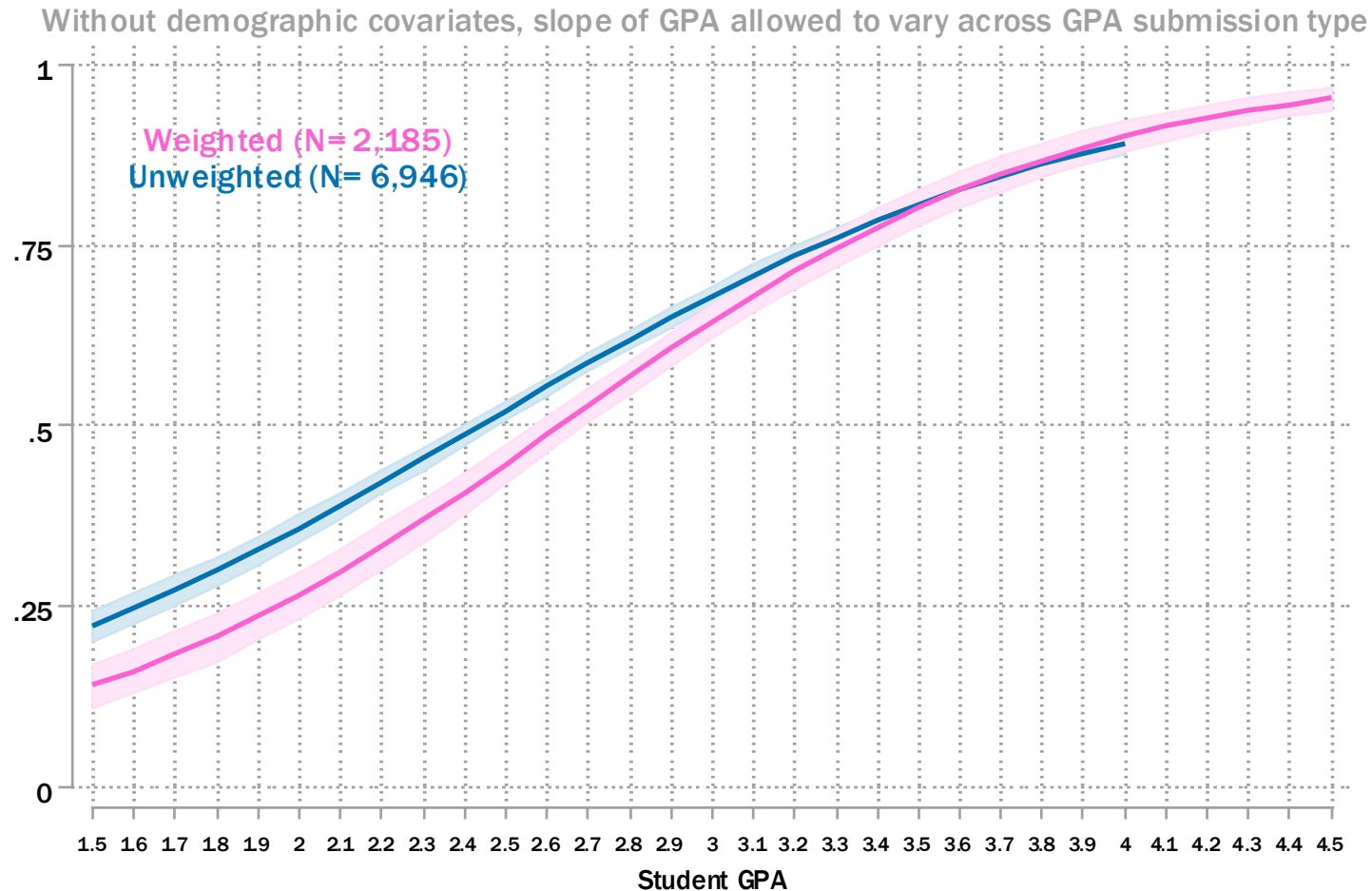
Why is it important to know the range of observed factors* that influence first year course placement?

- Some of these factors may be incorporated into policy.
- There is variability that the policy is not likely to account for (e.g., high school the student graduated from; gender).
- Knowing that systematic differences exist can help colleges and high schools work together to differentiate student support where appropriate.

*Other factors, not included in this study, may also influence students' first-year course placement.

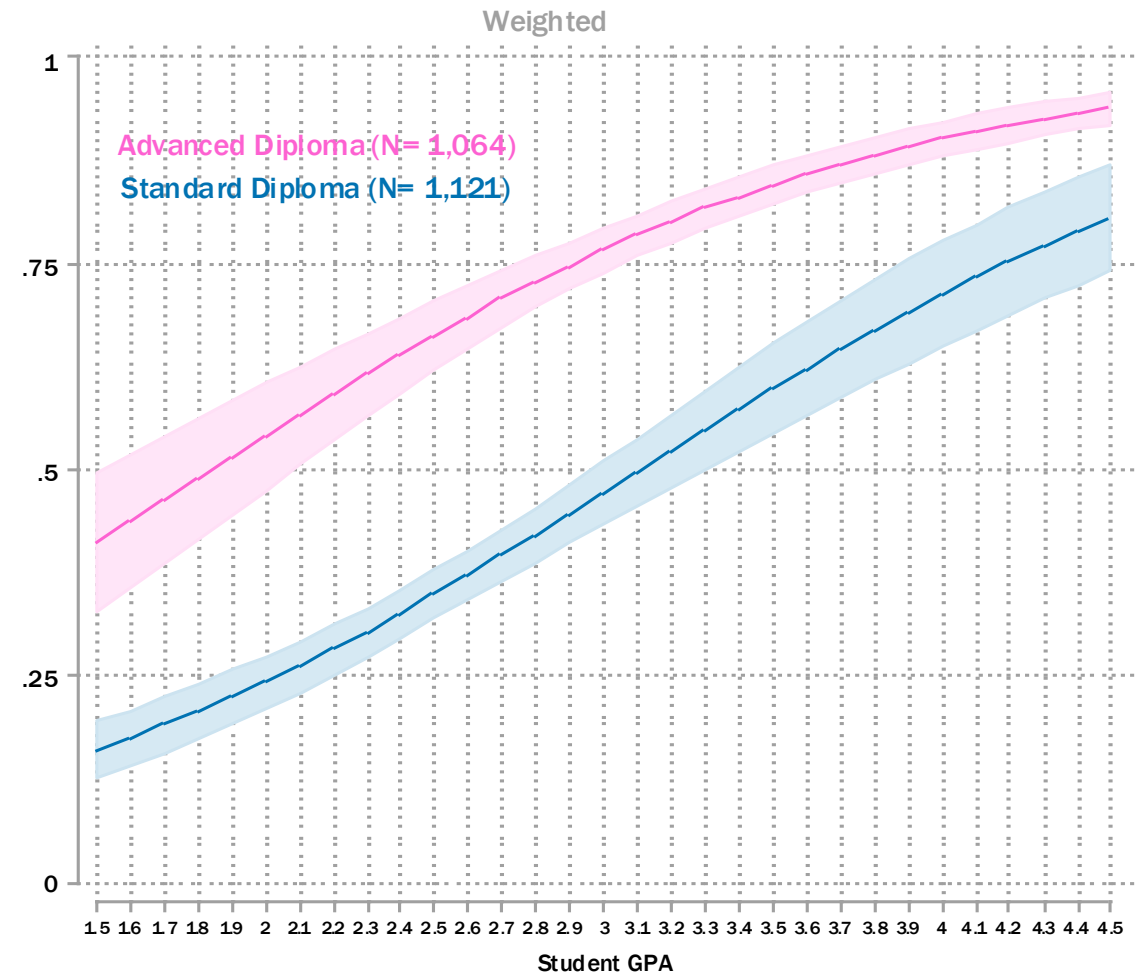
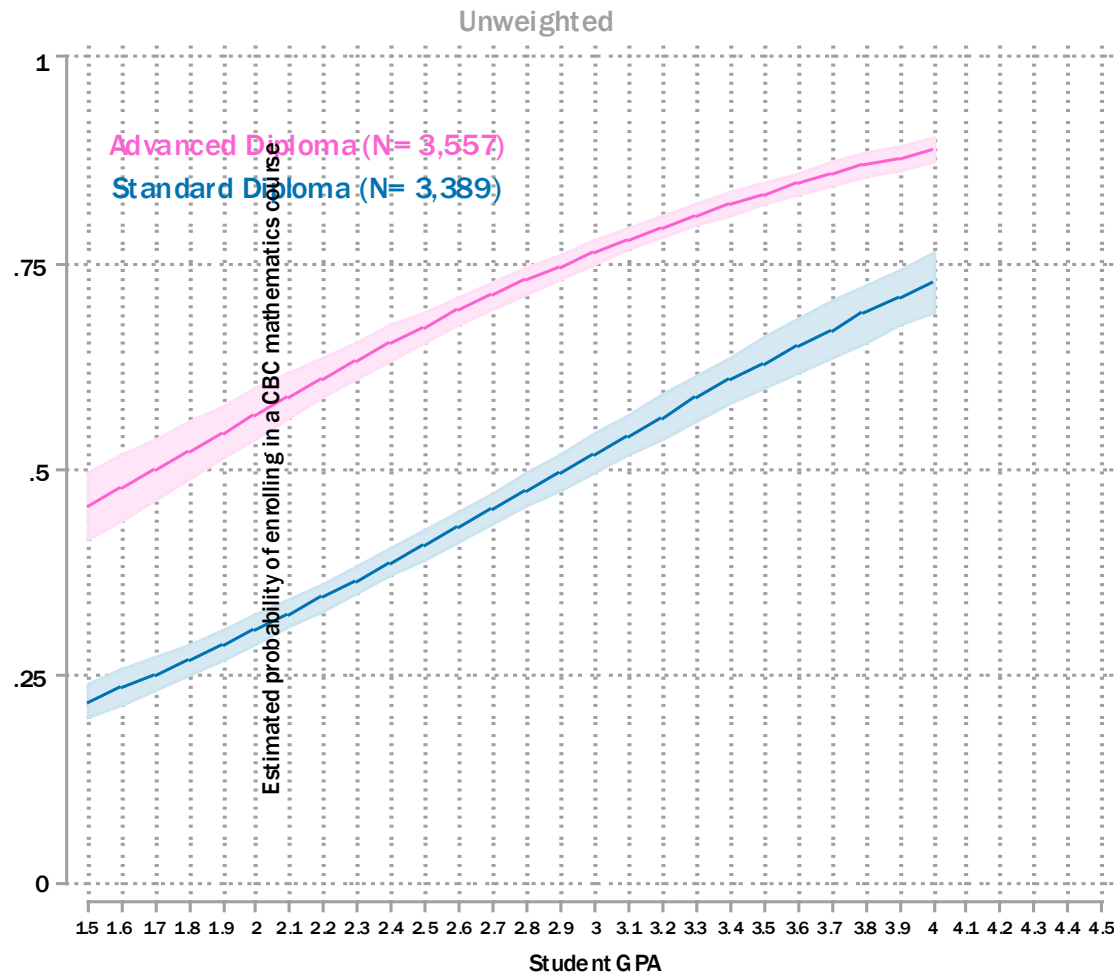
What is the association between GPA and first-year VCCS math course placement?

What is the association between GPA and enrollment into any math CBC?



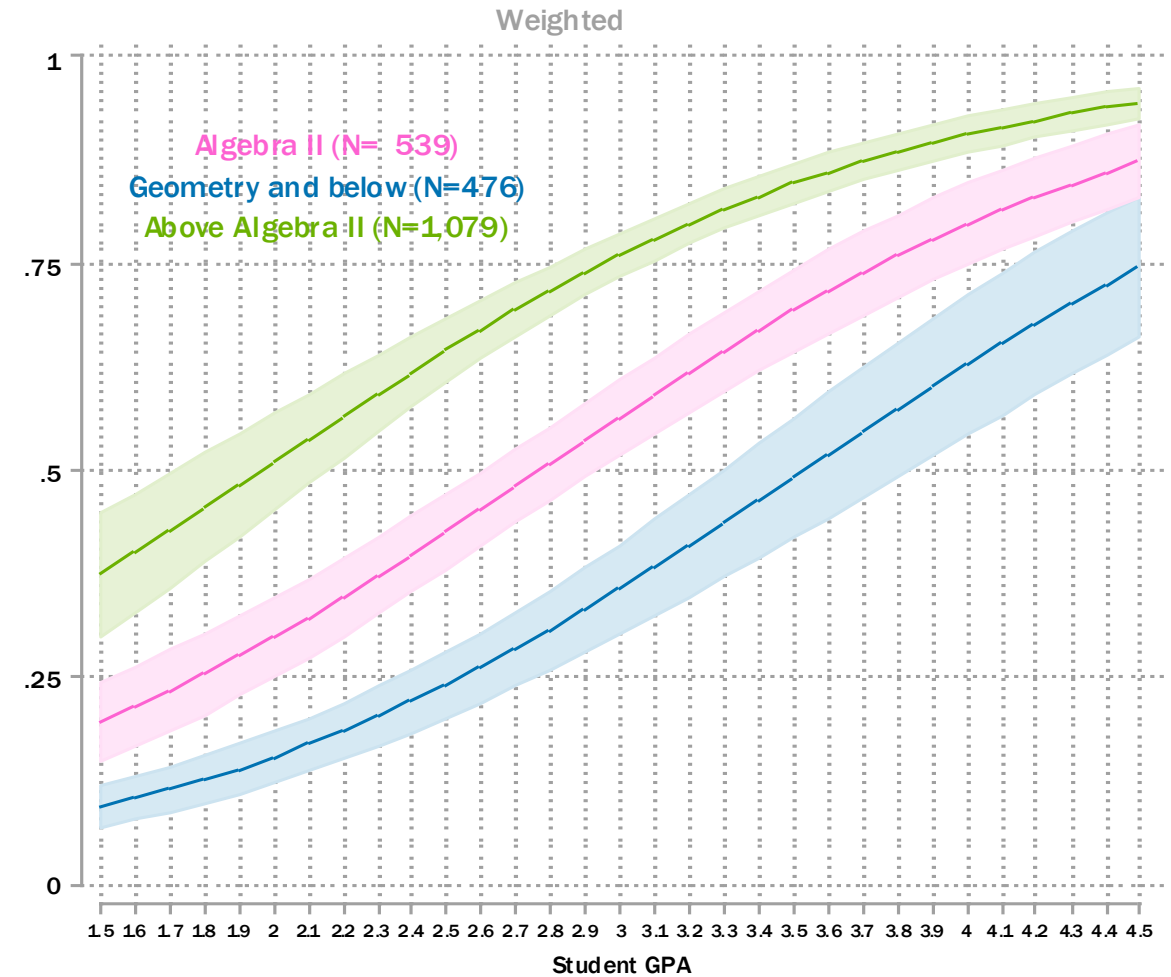
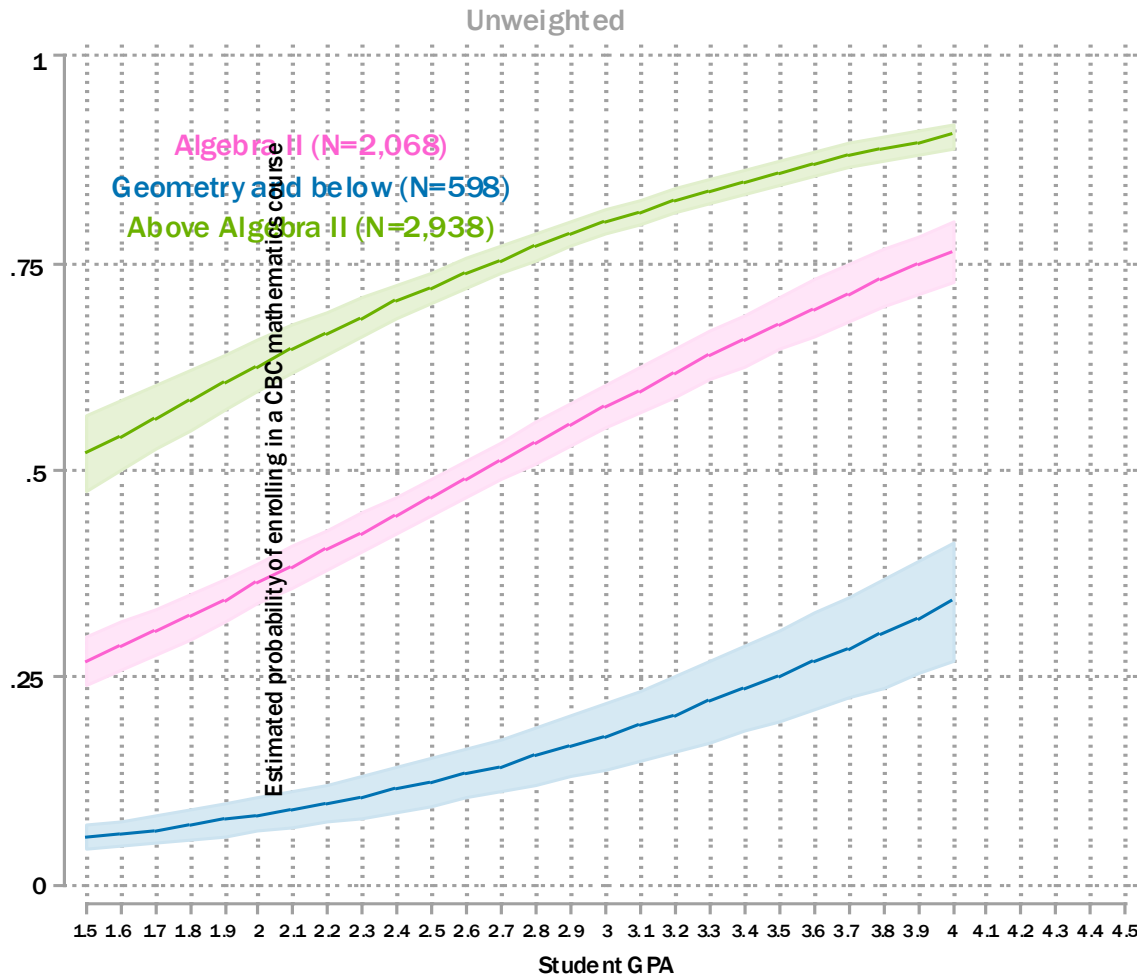
- Shows the probability of students enrolling in a CBC math course based on their high school GPA, with 95% confidence intervals.
- The differences in association between weighted and unweighted GPA are near zero around a GPA of 3.0

What is the association between GPA, enrollment into any math CBC, and high school diploma type?



No demographic covariate adjustment

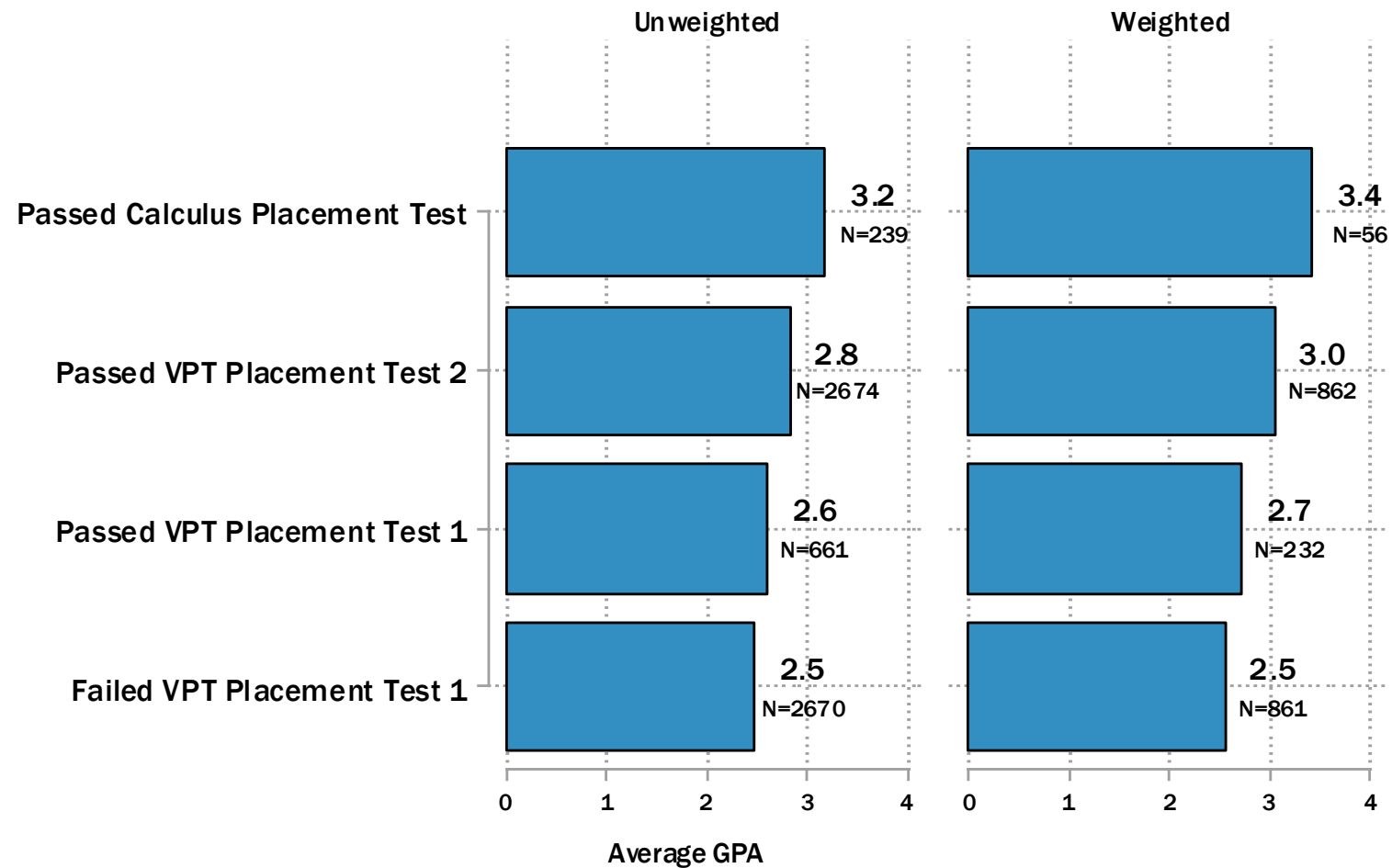
What is the association between GPA, enrollment into any math CBC, and the highest math class taken?



No demographic covariate adjustment

Was GPA associated with student placement outcomes based on VPT?

Average GPA by VPT placement level and GPA submission type



Discussion

Contact information

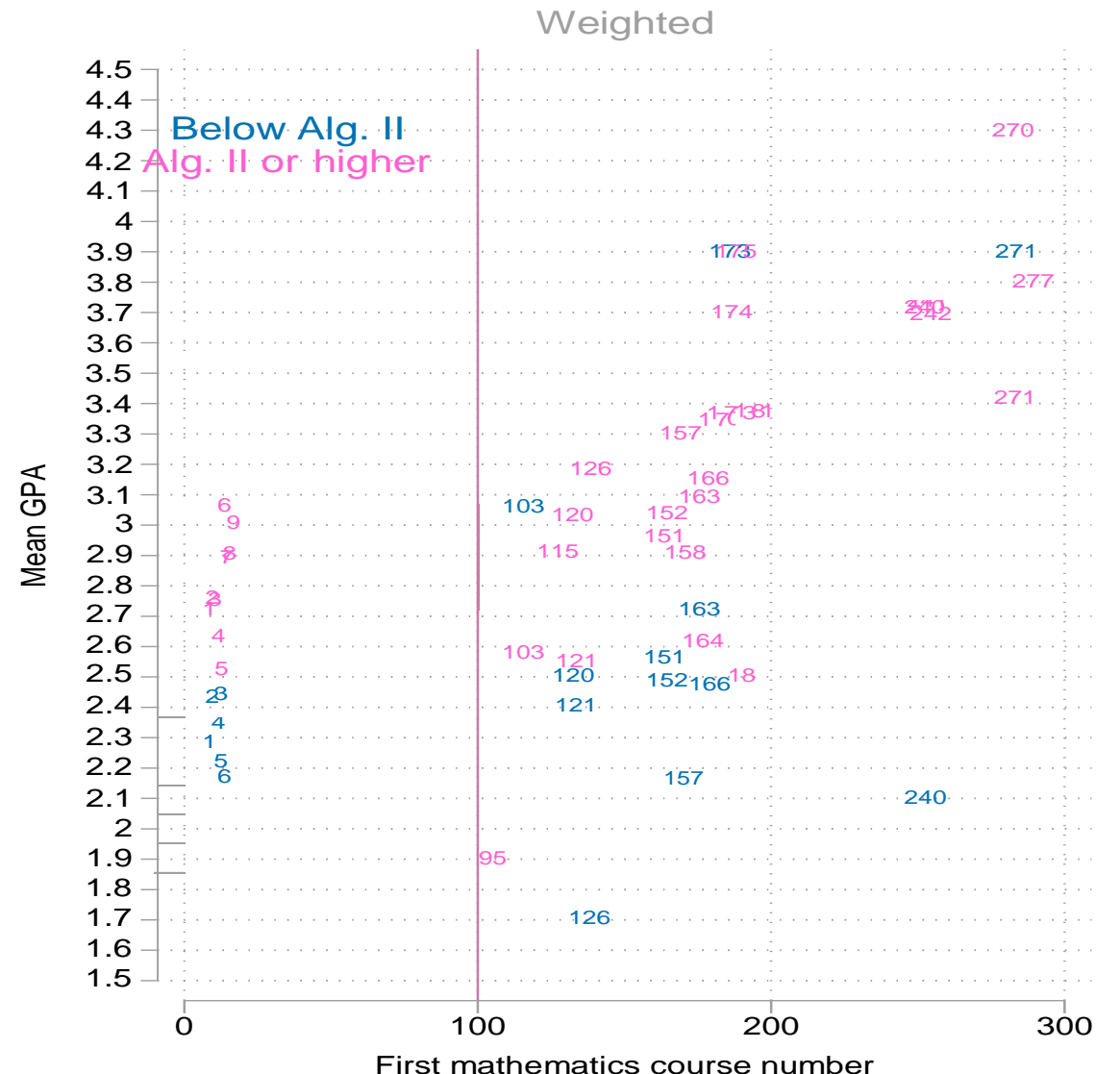
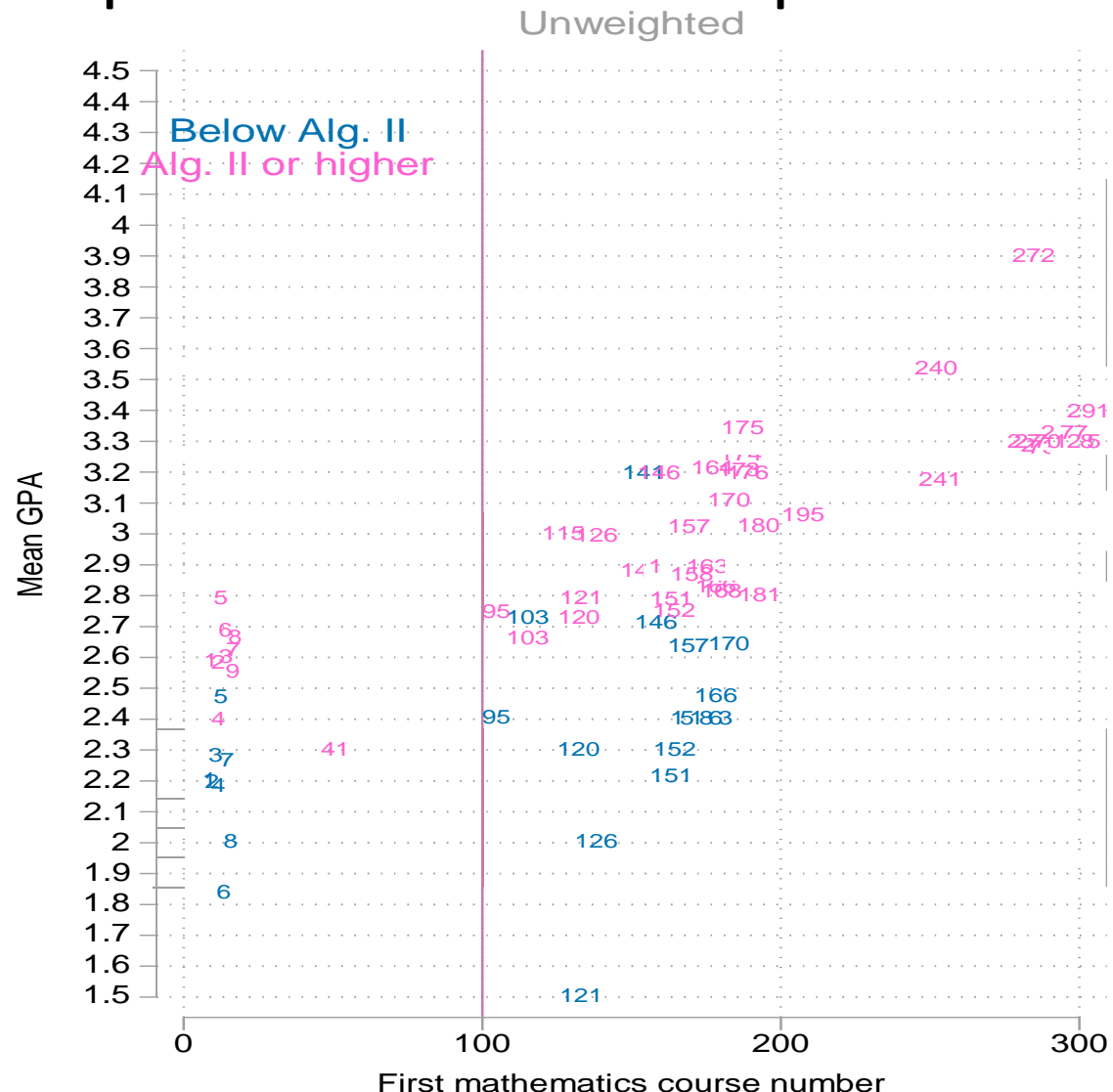
Deborah Jonas
Director and Principal Research Scientist
Center for Education Policy
SRI International
Deborah.Jonas@sri.com
804.252.5714

Marshall Garland
Research Scientist
Gibson Consulting Group
Mgarland@gibsonconsult.com
512.328.0884

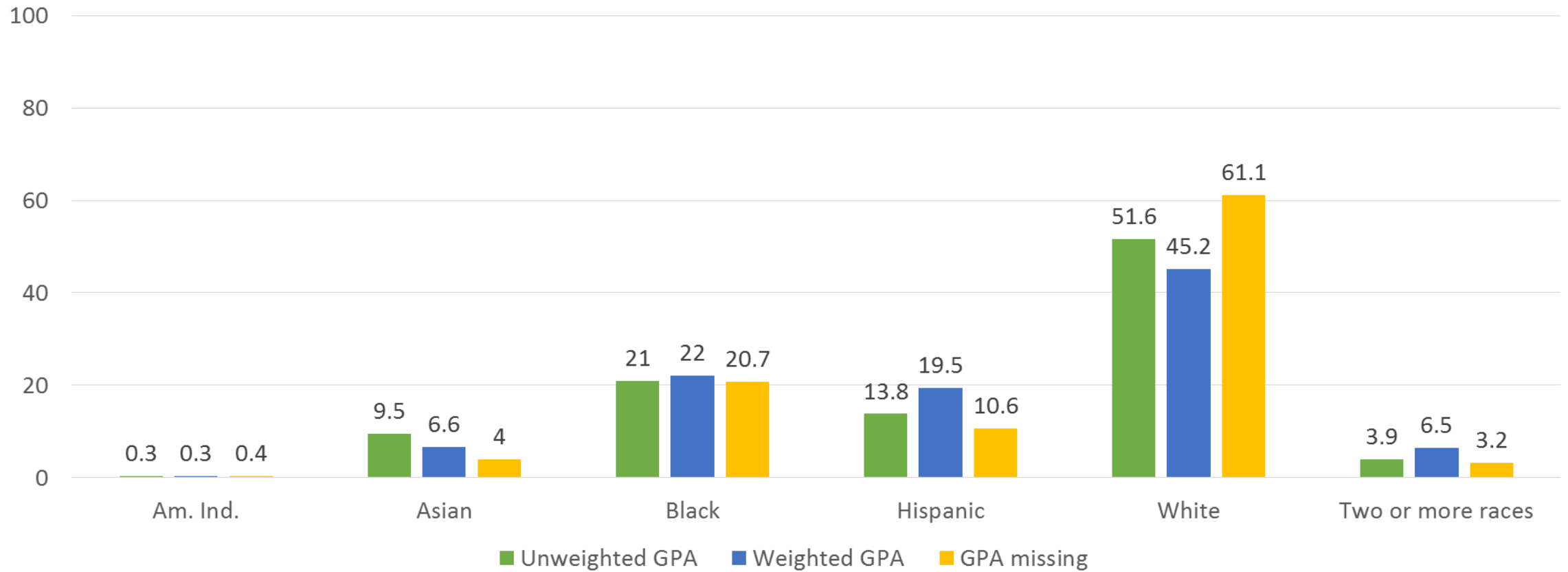
Backup slides

- Average GPA for students in specific first year math courses.
- More details about students with various types of GPA data.

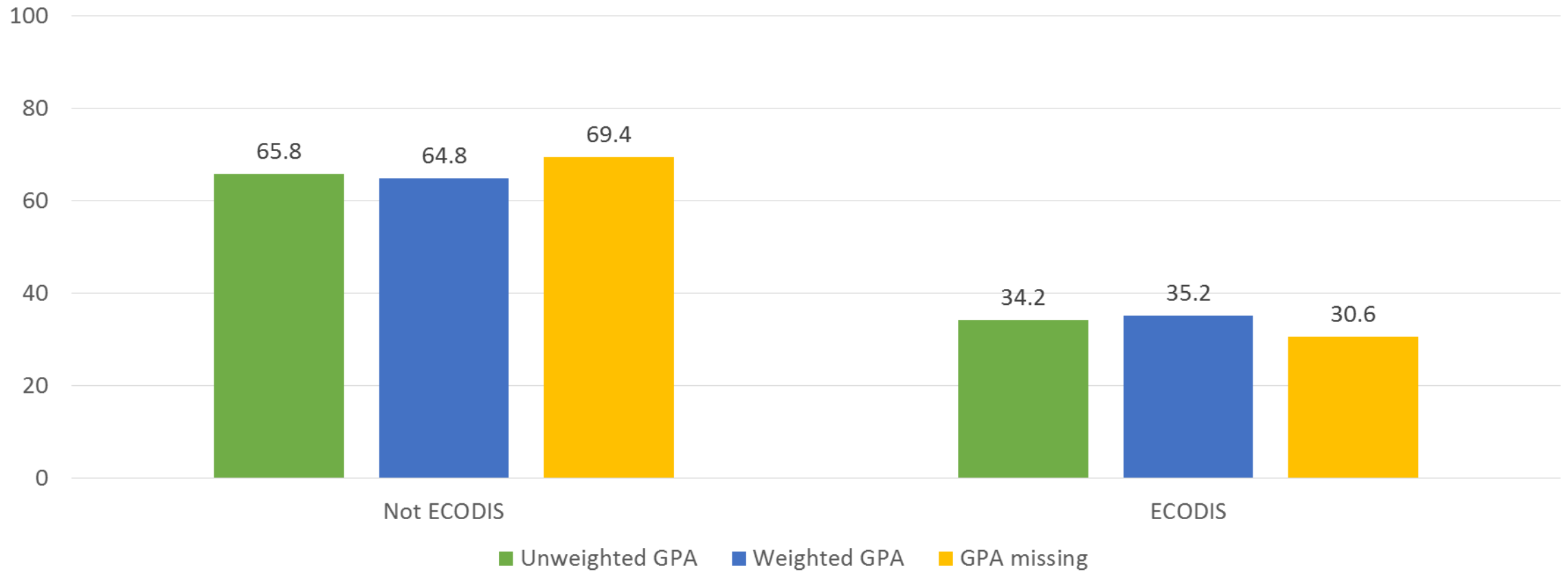
To what extent is GPA associated with placement in specific courses?



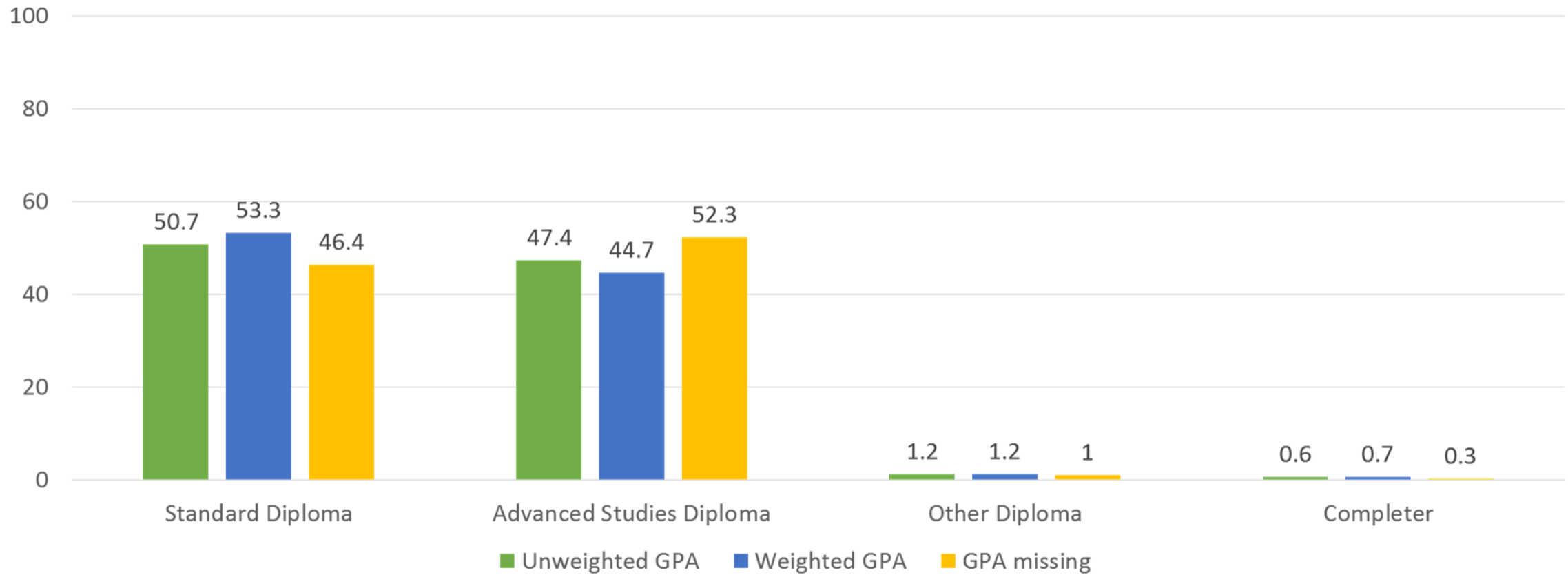
Percent of students by race and School Division Max GPA



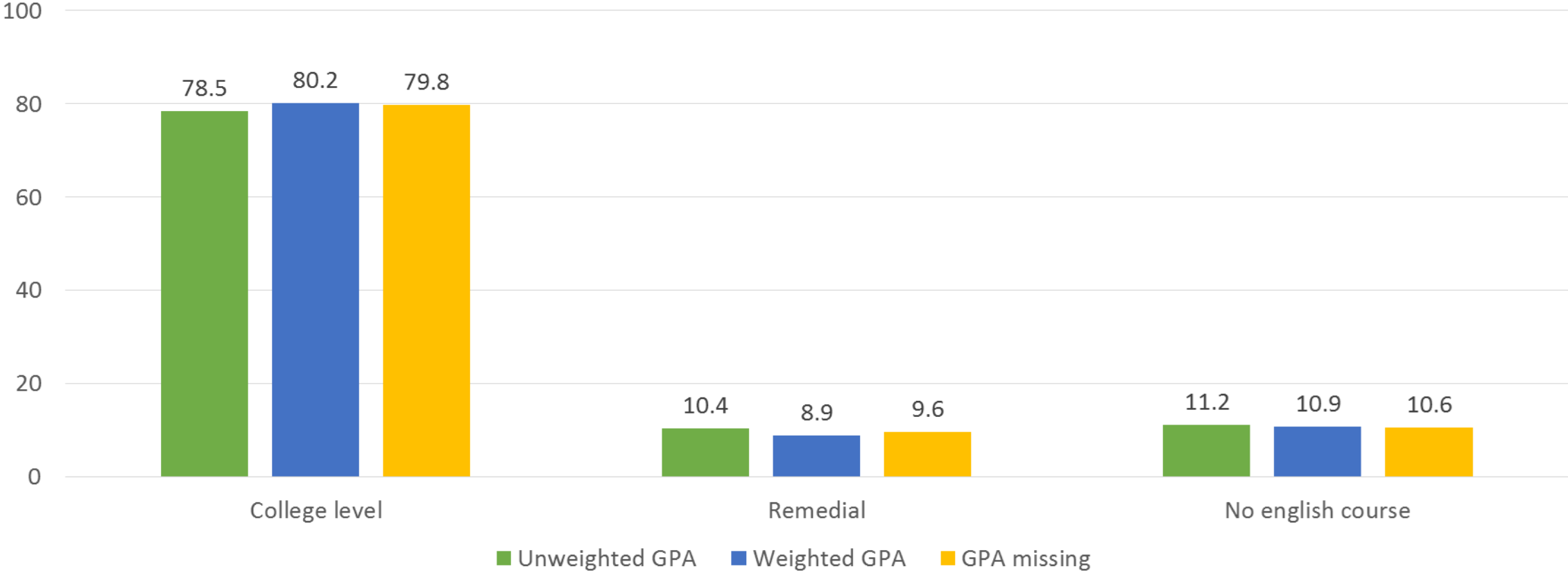
Percent of students by Economically Disadvantaged Status and School Division Max GPA



Percent of students by high school diploma type and School Division Max GPA



Percent of students by first year English placement and School Division Max GPA



Percent of students by first year Math placement and School Division Max GPA

