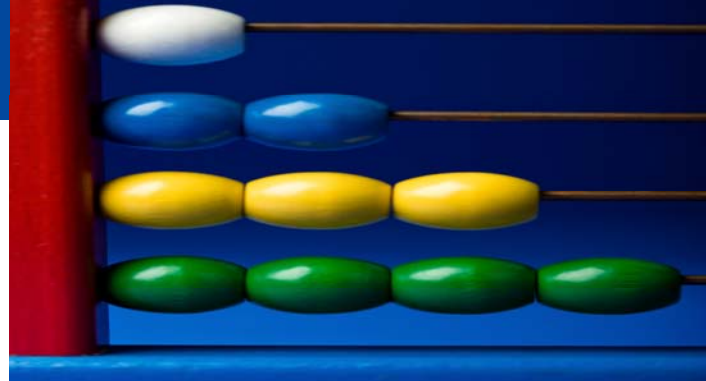


RESEARCH BRIEF



The Relationship Between Upper Level Math Courses in High School and College Success

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Academic preparation plays a significant role in access to college for most students, but for many African American students, it can be a major barrier (Adelman, 2006; Greene & Forster, 2003). A substantially smaller proportion of African American students than White or Asian students graduate from high school ready for college. African Americans comprise only 9% of those high school

graduates who are college-ready and just 11% of those who actually enroll in college (Greene & Forster, 2003).

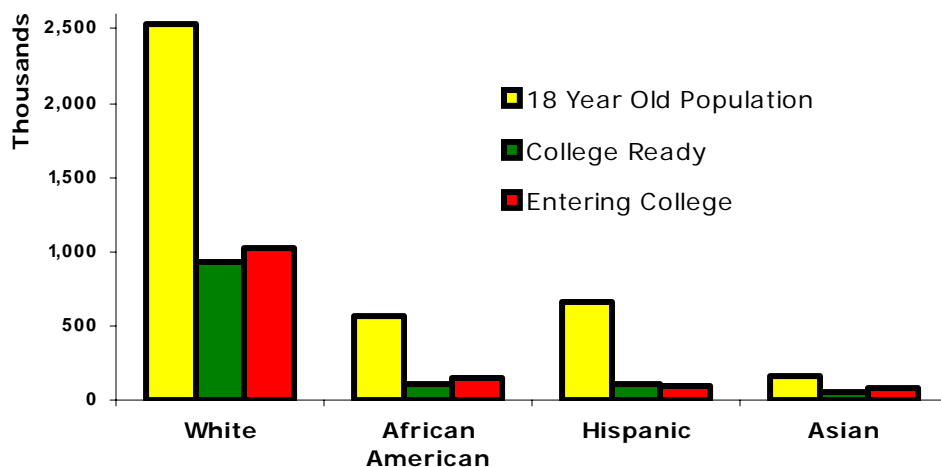
UPPER LEVEL MATH COURSES INCREASE THE ODDS OF EARNING A BACHELOR'S DEGREE

Research indicates that a key measure of academic preparedness is the highest level of mathematics courses taken. Using longitudinal data from the National Educational

Longitudinal Study, Adelman (2006) found that each additional upper level math class taken by high school students increases the odds two and a half times that they will earn a bachelor's degree. However, data show that African American students take a greater number of lower level math classes than do White and Asian American students. They also take fewer of the highest level classes. On average, 5% of all high school graduates have taken no or low level math classes compared to 7% for African American students, 5% for White students, and 2% for Asian American students.

The percentage of Hispanic, African American, and White students taking upper level math classes peaks at Algebra II (32%, 32% and 24%, respectively) and declines thereafter. However, for White students, the percentage taking higher level courses declines at a slower rate to that for African American students.

Figure 1
Comparison of Overall Population, Population Graduating from High School Prepared for College, and Population Entering College by Race (2000)



Note. Adapted from Greene, J. P., & Forster, G. (2003). *Public high school graduation and college readiness rates in the United States* (No. 3). New York: Center for Civic Innovation at the Manhattan Institute. Appendix Table 10, p. 23.

KEY STATISTICS

- African Americans comprise 14% of the population of 18 year-olds in the United States. Nearly half of this population do not graduate from high school (Greene & Forster, 2003).
- Only 20% of African American 18 year-olds graduate from high school college-ready.
- Approximately, 27% of African American 18 year-olds enroll in colleges and universities.

rate this information into their teaching and advising activities. Also, research should be initiated to determine the specific mechanisms involved in the relationship between taking higher math courses and graduating from college and how to effectively utilize this information to improve higher education outcomes.

The percentage of Asian/Pacific Islander students, who as a group attend college at the highest rate, peaks at Calculus (33%), the highest level.

IMPLICATIONS FOR DECISION MAKERS

If, as indicated by Adelman, advanced math courses are important contributors to college success, then several factors need to be addressed to insure that African American students benefit from this trend. Students must have equal access to upper level math classes. Historically, African American and Hispanic students as well as lower income students have attended high schools that were less likely to offer Calculus, Trigonometry, and Statistics (Adelman, 2006).

Information regarding the importance of preparing for and taking upper level math classes should be widely disseminated to those in a position to utilize it such as

Table 1
Percentage Distribution of the Highest Level Math Courses Completed by High School Graduates by Race/Ethnicity: 2004

Race/Ethnicity	No or Low Level Math ^a	Algebra I Geometry	Algebra II	Trigonometry Algebra III	Pre-calculus	Calculus
All	5.4	18.7	25.9	17.6	18.5	13.9
White	4.7	16.9	24.0	18.2	20.1	16.0
African American	7.0	19.8	31.5	22.9	14.0	4.7
Hispanic	7.1	27.0	31.6	13.0	14.5	6.8
Asian/Pacific Islander	2.2	11.3	17.5	12.5	23.1	33.4
American Indian/Alaska Native	15.3	22.8	40.1	8.9	7.2	5.6

Note. Adapted from the U.S. Department of Education, National Center for Education Statistics, National Assessment of Education Progress, 1998 and 2000 High School Transcript Studies; and Education Longitudinal Study of 2002

^aMath courses taken did not meet criteria.

teachers, school counselors, and others who influence student course taking patterns or the types of courses offered.

Teachers, school counselors, and other education professionals should be strongly encouraged to incorpo-

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: U.S. Department of Education.

Greene, J. P., & Forster, G. (2003). *Public high school graduation and college readiness rates in the United States* (No. 3). New York: Center for Civic Innovation at the Manhattan Institute.

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